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ENERGY

CONFERENCES

GRID-CONNECTED ICES: PRELIMINARY FEASIBILITY ANALYSIS AND EVALUATION

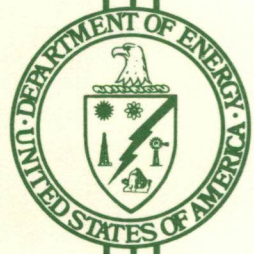
Final Report. Volume 3

Dist-391  
NTIS-25 97C

June 30, 1977

Work Performed Under Contract No. EC-77-C-02-4214

de Laurel Engineers, Incorporated  
New Orleans, Louisiana



U. S. DEPARTMENT OF ENERGY

Division of Buildings and Community Systems

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CONTRACT EC-77-C-02-4214

GRID-CONNECTED ICES  
PRELIMINARY FEASIBILITY ANALYSIS & EVALUATION

FOR

U.S. ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION

FINAL REPORT

JUNE 30, 1977

VOLUME I I OF I I I

HEALTH EDUCATION AUTHORITY OF LOUISIANA

NEW ORLEANS PUBLIC SERVICE INCORPORATED

DE LAUREAL ENGINEERS, INC.

ORR - SCHELEN - MAYERON AND ASSOCIATES, INC.

VOLUME III  
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**HEAL**

**HOPSI**

**de Laureal Engineers, Inc.**

**Orr-Schelen-Mayeron and Associates, Inc.**

**APPENDIX A**

**THE DEMONSTRATION COMMUNITY**

**MAPS, CHARTS & DRAWINGS**

**EXHIBIT II**

**EXHIBIT Va THRU Vg**

PHYSICAL PROFILE OF EXISTING BUILDINGS

NO.	NAME	FUNCTION	STRUCTURAL CHARACTERISTICS			BUILDING AREAS			
			FLOORS	FRAM.	EXTERIOR WALL	FUNCTION/AREA	TOTAL AREA	EXTERIOR WALL	WINDOW
1.	Charity - Main Hosp.	Patient Care Adjunct (1) Service (2) Administration	Basements + 13, 15 & 20 floors	Str. steel concrete	24"-Limestone brick, clay, tile, - tile	P.C. ADJ. 536,725 333,785	990,225	532,000	74,500
a.	Charity - Bibert Radiation Therapy Center	Patient Care	Basement Only	Reinforced Concrete	12"-Brick	P.C. 1,800	3,800	-----	-----
2.	Charity - Contagion Unit	Patient Care Administration	Basement + 5 floors	Str. Steel	12"-Brick, tile	P.L. ADM. 24,800 6,200	31,000	200,000	2,800
3.	Charity La Peyre/Miltzberger	Research, Patient Care, Services Other	Basement + 7 floors	Reinforced Concrete	12"-stone, tile	RES. P.C. SERV. OTHER 22,750 22,450 7,650 7,650	60,500	34,000	4,800
4.	Education Bldg. (leased to LSU by Charity)	Education	3 floors	Reinforced Concrete	12"-Block	ED. 10,200	15,000	2,100	2,100
5.	Charity - Bibert Clinic Services	Patient Care Services Other	Basement + 4 floors	Str. steel	12"-Brick, block	P.C. SERV. OTHER 25,760 12,880 25,760	64,400	34,000	4,800
6.	Charity - Woman's Pavilion (WB - 6TH)	Patient Care	Basement + 3 floors	Str. Steel	12"-Brick & Tile	P.C. 22,800	22,800	17,000	2,400
7.	Charity - Student Nurses Res.	Dormitory	Basement + 10 & 16 floors	Reinforced	12"-Brick & Tile	RES. 141,656	141,656	120,000	24,000
8.	Charity - School of Nursing	Education	Basement + 9 floors	Reinforced Concrete	12"-Brick & Tile	ED. 266,910	266,910	75,000	10,500
9.	Charity - Maintenance Shops	Service	1 & 3 floors	Str. Steel	10"-Brick & asbestos	SERV. 19,407	19,407	14,000	3,500
10.	Charity - Warehouse Building	Warehouse	5 floors	Reinforced Concrete	12"-Brick & Block	SERV. 62,660	62,660	32,000	8,000
11.	Charity - Laundry Bldg.	Service	1 & 3 floors	Str. Steel & Reinforced concrete	12"-brick & block	SERV. 27,520	27,520	16,000	4,000
12.	Charity - Power House	Energy	1 & 2 floors	Str. Steel	16"-Brick	21,120	21,120	14,000	3,500

A-1-1

PHYSICAL PROFILE OF EXISTING BUILDINGS

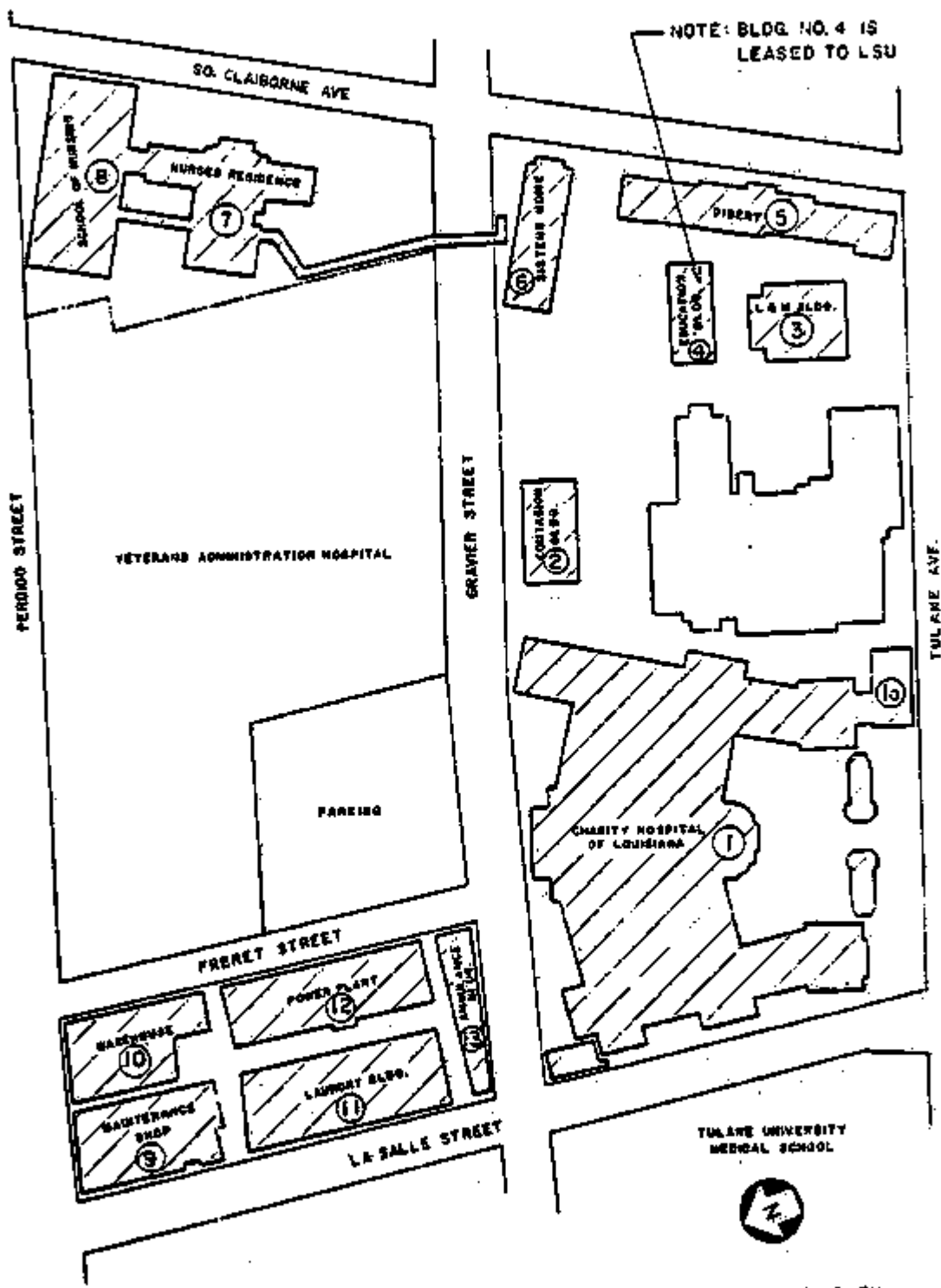
	NAME	FUNCTION	STRUCTURAL CHARACTERISTICS			BUILDING AREAS			
			FLOORS	FRAME	EXTERIOR WALL	FUNCTION/AREA	TOTAL AREA	EXTERIOR WALL	WINDOW
13.	Charity - Building Service & Garage	Administrative Garage	2 floors	Reinforced Concrete	12"-Concrete	ADM. 9,640 GAR. 5,000	14,640	12,000	1,700
	SUBTOTAL						1,750,438	935,000	146,600
14.	Eye, Ear, Nose & Throat Hospital	Patient Care Adjunct Service Administration	Basement + 4 floors	Str. Steel & Concrete	16"-Brick, clay tile, 3" Gyp.	P.C. 30,800 ADM. 5,007 SERV. 22,359 ADM. 13,006	71,200	54,000	7,560
	SUBTOTAL						71,200	54,000	7,560
15.	LSU - School of Medicine	Education Service Administration	Basement + 6 floors	Str. Steel & Concrete	14"-total thick. - Limestone, Clay tile, Plaster	ED. 107,150 LABS 157,750 SERV. 41,245 ADM. 16,000	322,145	145,705	29,029
16.	LSU - Residence Hall	Dormitory		Str. Steel & Concrete	12"-Concrete 1-1/2" Air space 5/8" Gyp.	DORM. 150,000	135,000	66,912	10,816
17.	LSU - Medical Education Buildings (Basic Science)	Education Service Administration	Basement + 7 floors	Reinforced Concrete	10" Total Thick. - Pre-cast Conc. Panel, clay tile & 3/4" Gyp or Cov. tile	ED. & LABS 329,300 ADM. 24,000	(485,200) FUTURE * SEE NOTE	(103,891) FUTURE * SEE NOTE	(16,380) FUTURE *SEE NOTE
	SUBTOTAL						457,145	212,617	39,846
18.	Veterans Administration (V.A.) - Hospital & Annex Building	Patient Care Adjunct Service Admin.	Basement + 10 floors	Reinforced Concrete	14"-Masonry (incl. brick veneer)	P.C. 207,800 ADJ. 73,300 SERV. 48,800 ADM. 33,200	363,100	173,850	34,170
19.	V.A. - Hospital Bldg.	Adjunct Admin. Dormitory	5 floors	Reinforced Concrete	14"-Masonry (incl. brick veneer)	ADM. 3,700 ADM. 9,300 DORM. 5,600	18,600	11,960	2,450
20.	V.A. - Research	Research	2 floors	Reinforced Concrete	14"-Masonry (incl. brick veneer)	RES. 9,100	9,100	3,700	825
21.	V.A. - Laundry, Boiler & Animal House	Adjunct Service	1 floor	Reinforced Concrete	14"-Masonry (incl. brick veneer)	ADM. 4,500 SERV. 11,000	15,500	14,000	1,600
	SUBTOTAL						406,300	203,510	39,095

A-1-2

PHYSICAL PROFILE OF EXISTING BUILDINGS

NO.	NAME	FUNCTION	STRUCTURAL CHARACTERISTICS			BUILDING AREAS				
			FLOORS	FRAME	EXTERIOR WALL	FUNCTION/AREA	TOTAL AREA	EXTERIOR WALL	WINDOW	
22.	Tulane - School of Medicine	Education Patient Care Adjunct Services Admin.	Basement + 9 floors	Combination: Reinforced Con- crete and Str. steel and conc.	12"-masonry (brick & block, and Precast panels with masonry back-up)	ED. 131,800 P.C. 35,500 ADJ. 279,200 SERV. 09,300 ADM. 39,300	547,100	186,000	26,000	
23.	Tulane University - Teaching Hospital and ambulatory teaching Facility	Education Patient Care Adjunct Services Admin.	7 floors	Str. Steel Concrete	15" masonry (brick & block)	ED. 95,277 P.C. 171,500 ADJ. 86,500 SERV. 36,500 ADM. 23,299	415,000	140,800	15,512	
24.	Tulane	Research	3 floors	Reinforced Concrete	12" Block with stucco	RES. 25,127 SERV. 11,126	36,253	16,900	2,366	
SUBTOTAL							998,353	313,700	43,878	
							<u>BUILDING AREA SUMMARY</u>			
							Charity	1,750,438	935,000	106,600
							EENT	71,200	54,000	7,560
							LSU	457,145	212,617	39,845
							NA	406,300	203,610	39,095
							TULANE	998,353	313,700	43,878
							* GROSS AREAS	3,683,436	1,718,827	276,978
							<p>* SPECIAL NOTE:</p> <p>Since Building No. 17 is currently under construction with completion scheduled 2-1/2 years away, it is considered a future structure and its areas are not included in above totals.</p> <p>NOTE: (1) Adjunct Facilities includes Laboratories, Radiology, Physical Medicine, Pharmacy, Etc.</p> <p>(2) Service includes dietary, laundry, housekeeping, general stores, employee facilities and engineering.</p>			

A-1-3

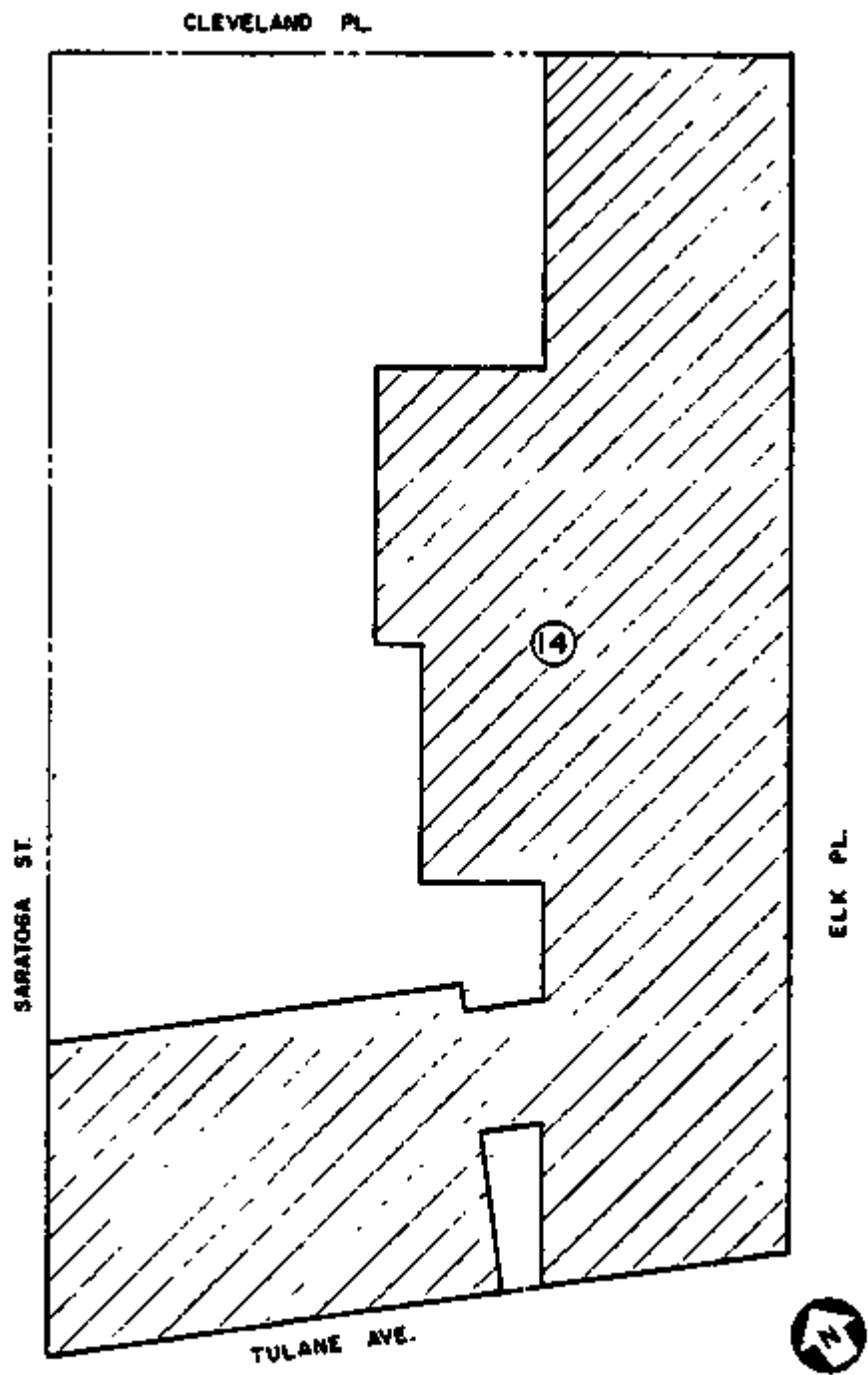


DE LAUREL ENGINEERS, Inc.  
CONSULTING ENGINEERS  
NEW ORLEANS, LA

SCALE  
0 (APPROX.) 100 200 FEET

CHARITY HOSPITAL COMPLEX  
SITE PLAN

EXHIBIT V-a



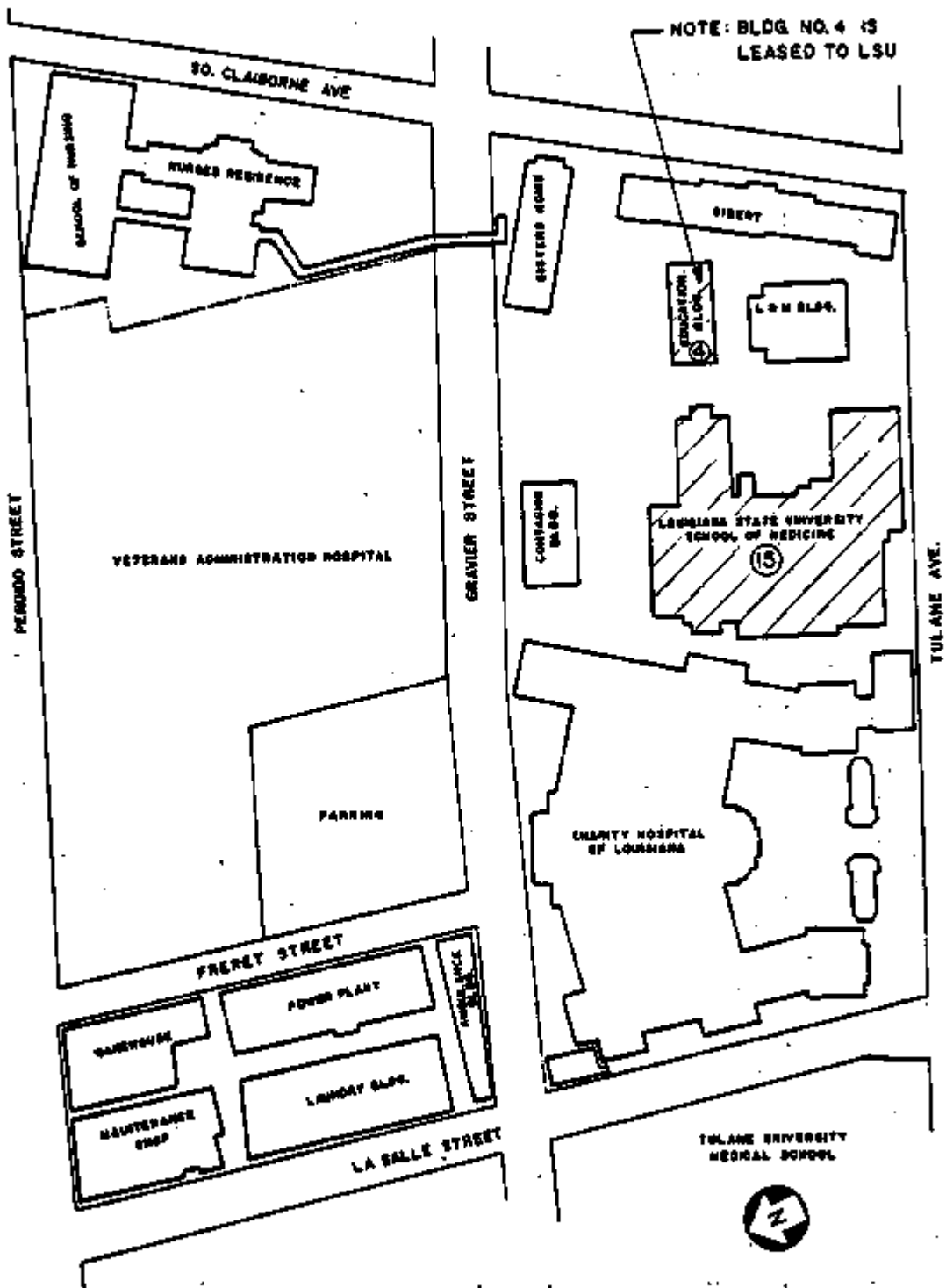
**EYE, EAR, NOSE & THROAT HOSP.**

**SITE PLAN**

DE LAUREAL ENGINEERS, INC.  
 CONSULTING ENGINEERS  
 NEW ORLEANS, LA



EXHIBIT V-B



NOTE: BLDG NO. 4 IS  
LEASED TO LSU

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CONSULTING ENGINEERS  
NEW ORLEANS, LA

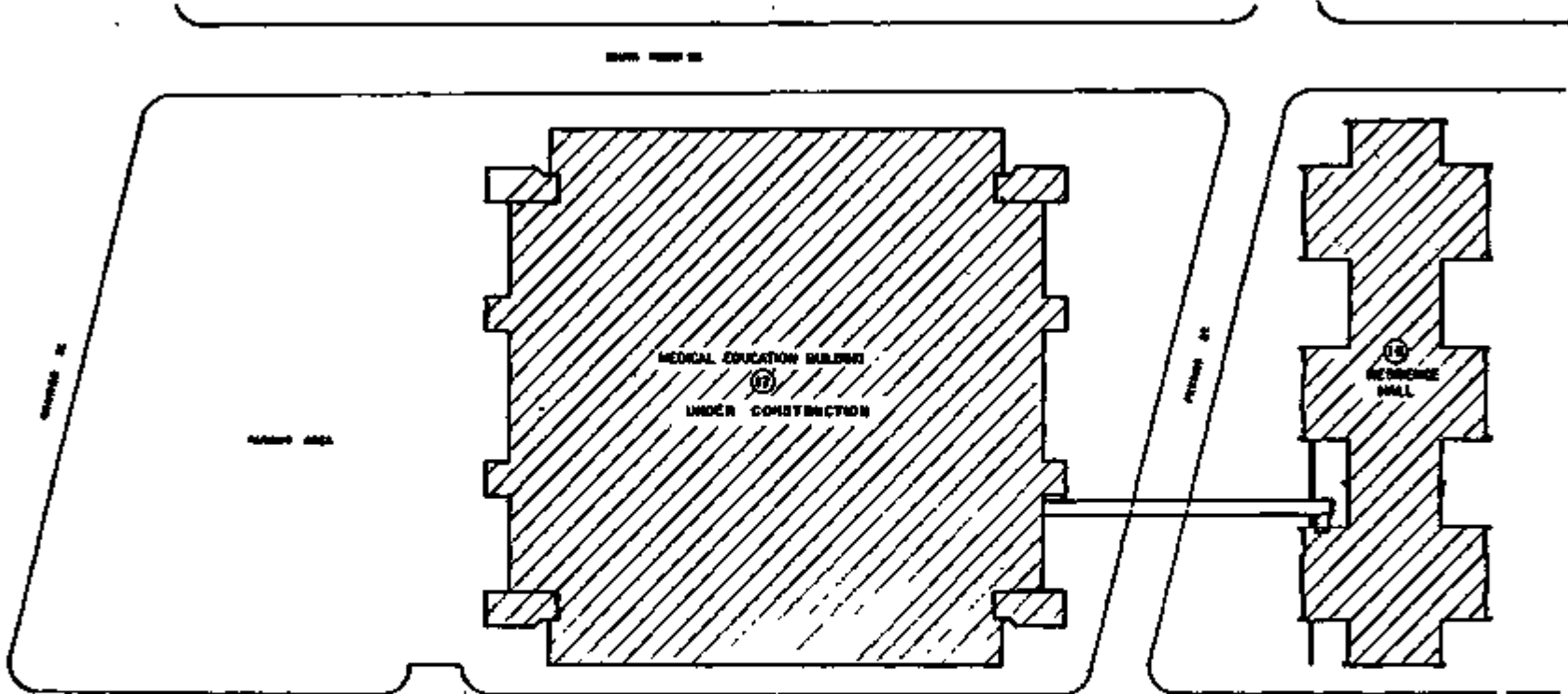
SCALE (APPROX)  
100 50 0 200  
FEET

L.S.U. SCHOOL OF MEDICINE

SITE PLAN

EXHIBIT V-c

A-1-7



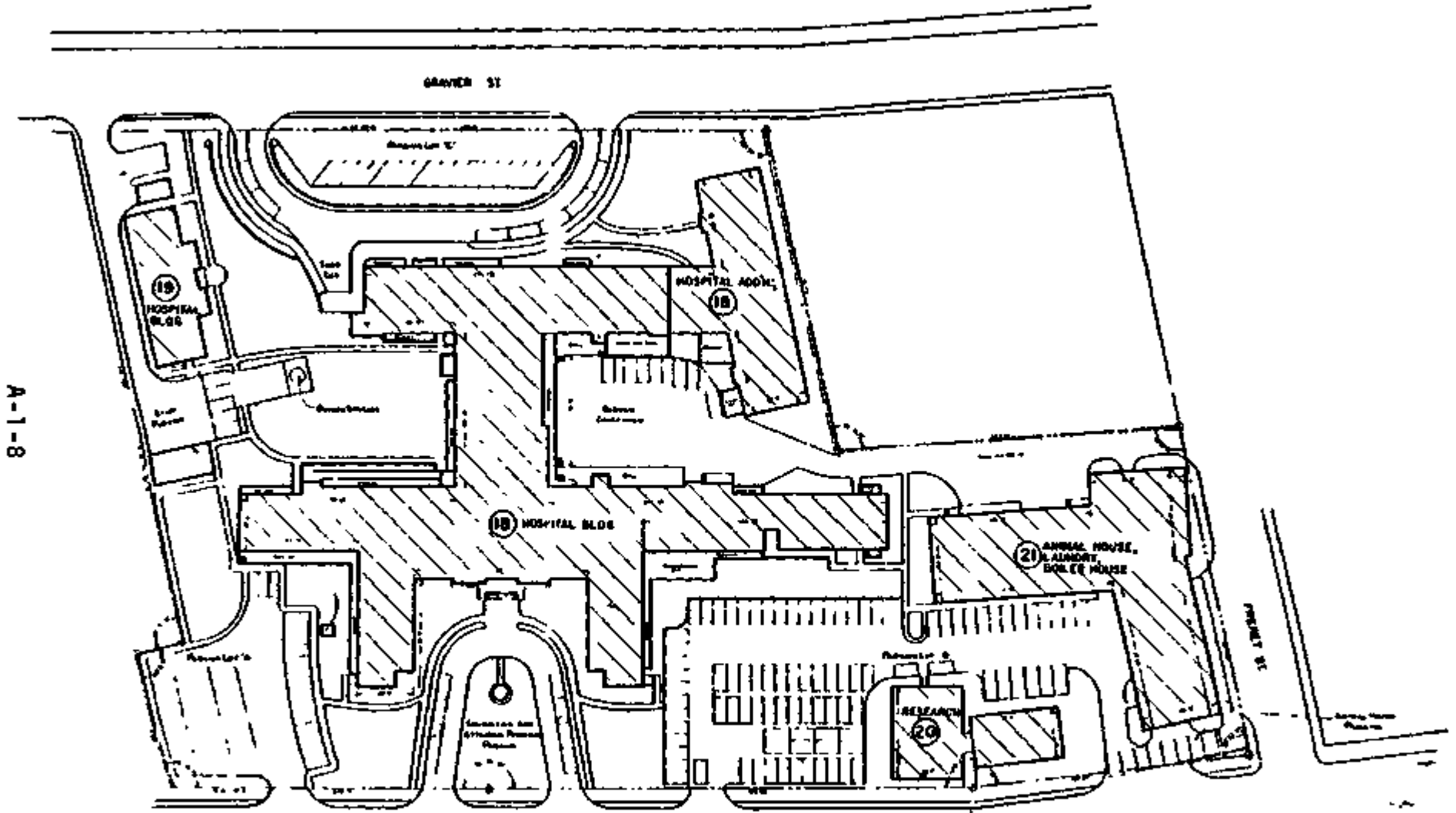
ARCHITECTURAL DEPARTMENT  
NAVY DEPARTMENT  
WASHINGTON, D.C.



SEE REFERENCE HALL  
FOR THE CENTER EDUCATION BLDG.  
SEE PLAN



COMPT 1-4



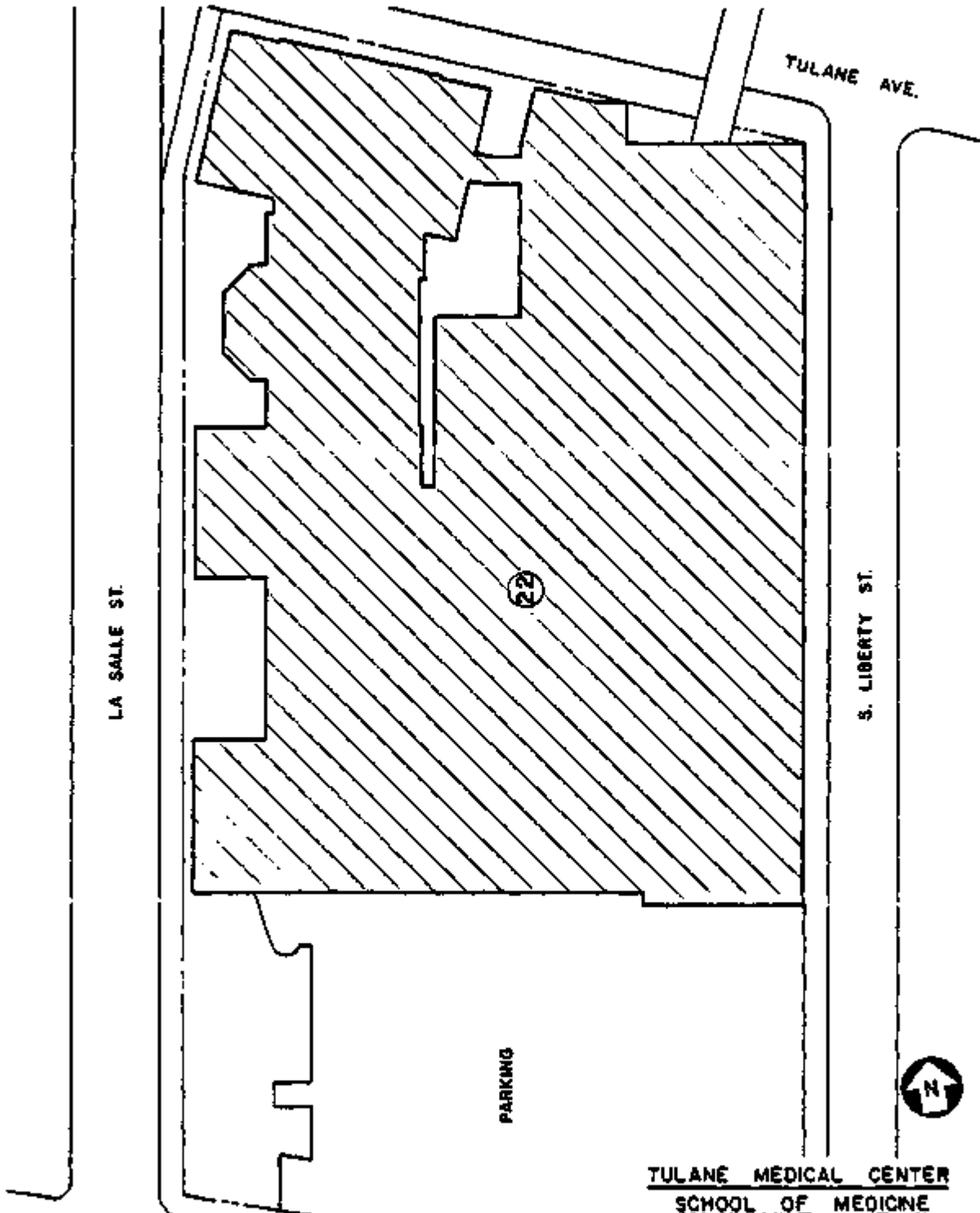
A-1-8

DE LAURIAL ENGINEERS, INC  
 CONSULTING ENGINEERS  
 NEW YORK, N.Y.



VETERANS ADMIN HOSPITAL COMPLEX  
 SITE PLAN

EXHIBIT V-6



GRAVIER ST.  
 DE LAUREAL ENGINEERS, INC  
 CONSULTING ENGINEERS  
 NEW ORLEANS, LA

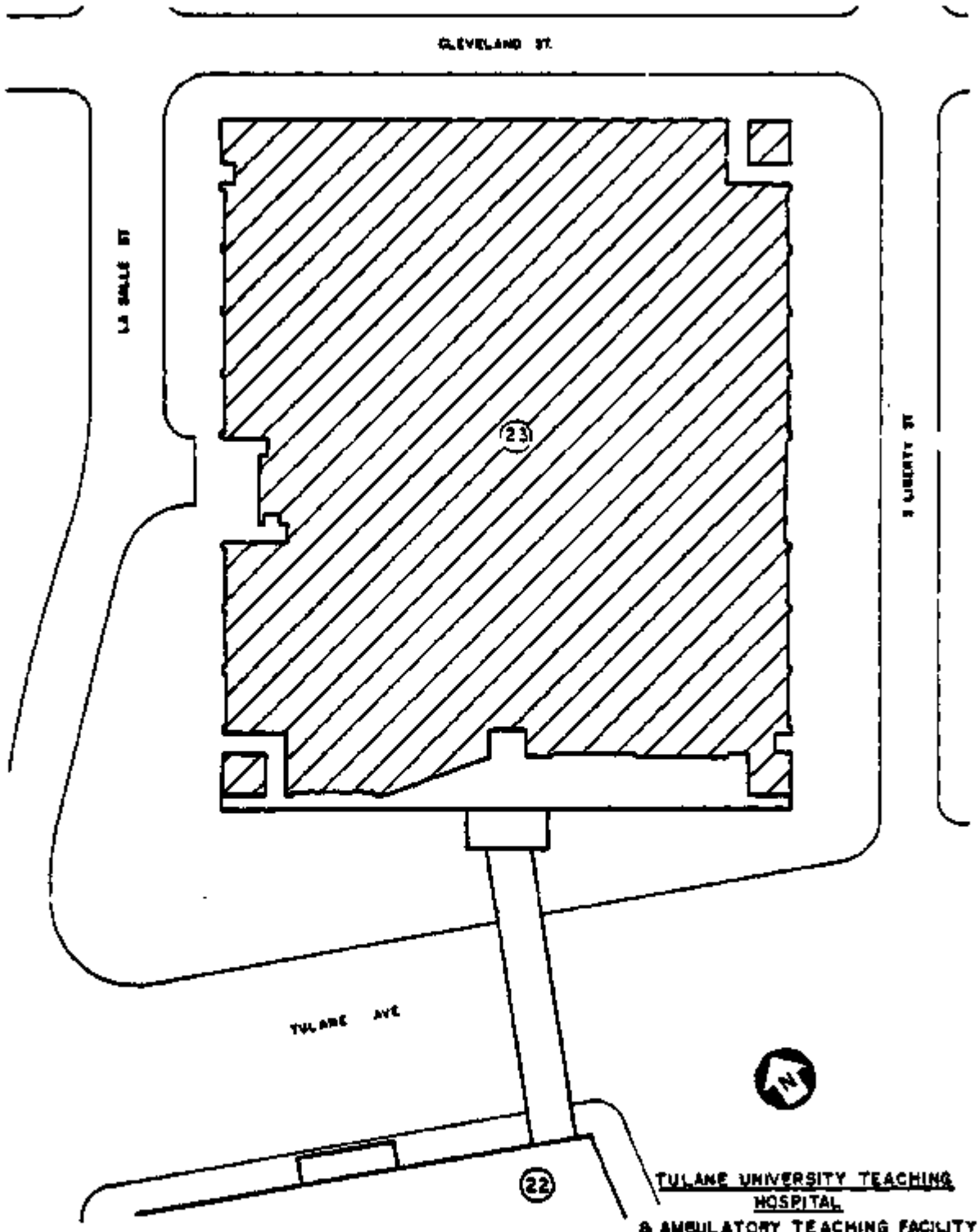
TULANE MEDICAL CENTER  
 SCHOOL OF MEDICINE



SITE PLAN

EXHIBIT V-1

A-1-9



DE LAUREAL ENGINEERS, INC.  
 CONSULTING ENGINEERS  
 NEW ORLEANS, LA

SCALE  
 (APPROX.)  
 0 100 FEET

TULANE UNIVERSITY TEACHING  
 HOSPITAL  
 & AMBULATORY TEACHING FACILITY  
 SITE PLAN

EXHIBIT V-g

A-1-10

**APPENDIX B**

**DEMAND PROFILES  
TABLES & GRAPHS**

**B-1-1 THRU B-1-67 &  
B-2-1 THRU B-2-28**

ERDA - ICES

COMPOSITE FOR ALL BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: Spring (& Fall)

	Exist. Bldgs.	Future Additions	Composite-All
A.M. 1	60.32	7.23	67.55
2	59.32	7.23	66.55
3	60.32	7.23	67.55
4	61.32	7.23	68.55
5	58.82	7.23	66.05
6	66.07	11.16	77.23
7	73.42	14.82	88.24
8	79.52	16.79	96.31
9	81.26	16.79	98.05
10	75.76	16.79	92.55
11	73.76	16.79	90.55
12	75.56	16.79	92.35
P.M. 1	74.90	16.79	91.69
2	78.90	16.79	95.69
3	79.72	16.79	96.51
4	75.02	16.79	91.81
5	68.36	16.79	85.15
6	65.56	14.11	79.67
7	62.04	11.16	73.20
8	61.06	9.20	70.26
9	63.56	8.22	71.78
10	59.36	8.22	67.58
11	57.76	8.22	65.98
12	56.16	8.22	64.38

**ERDA - ICES**  
**COMPOSITE FOR ALL BUILDINGS**  
**TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE**  
**STEAM - POUNDS/HOUR x 10<sup>3</sup>**

Season: Summer

	Exist. Bldgs.	Future Additions	Composite-All
<b>A.M. 1</b>	56.08	6.18	62.26
2	56.58	6.18	62.76
3	55.58	6.18	61.76
4	55.58	6.18	61.76
5	55.63	6.18	61.81
6	61.03	6.18	67.21
7	57.59	9.52	67.11
8	72.79	12.22	85.01
9	63.47	12.22	80.69
10	66.97	12.22	79.19
11	69.03	12.22	81.25
12	67.03	12.22	79.25
<b>P.M. 1</b>	67.03	12.22	79.25
2	56.53	12.22	78.75
3	57.69	12.22	79.91
4	57.49	12.22	79.71
5	69.49	12.22	81.71
6	62.69	9.52	72.21
7	63.19	8.54	71.73
8	61.29	8.54	69.83
9	59.59	7.56	67.15
10	58.79	7.16	65.95
11	59.75	6.77	66.52
12	51.50	6.77	63.27

ERDA - ICES

COMPOSITE FOR ALL BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: Winter

	Exist. Bldgs.	Future Additions	Composite-All
A.M. 1	90.49	27.15	117.64
2	37.99	27.15	115.14
3	85.99	27.15	113.14
4	88.49	27.15	115.64
5	95.49	31.08	126.57
6	97.54	40.91	138.45
7	116.14	40.91	157.05
8	98.74	40.91	139.65
9	98.04	40.91	138.95
10	97.54	40.91	138.45
11	97.38	40.91	138.29
12	92.38	40.91	133.29
P.M. 1	94.38	40.91	135.29
2	90.38	40.91	131.29
3	96.04	40.91	136.95
4	104.94	40.91	145.85
5	92.54	40.91	133.45
6	94.67	38.94	133.61
7	94.83	35.01	129.84
8	91.33	35.01	126.34
9	90.63	31.08	121.71
10	83.63	31.08	114.71
11	86.95	27.15	114.10
12	86.15	27.15	113.30

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: Spring (& Fall)

	EENT	L.S.U.		TULANE			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.57	0.50	1.80	3.00	13.30	6.90	4.75	29.50	60.32
2	0.57	0.50	1.80	3.00	13.30	6.90	4.75	28.50	59.32
3	0.57	0.50	1.80	3.00	13.30	6.90	4.75	29.50	60.32
4	0.57	0.50	1.80	3.00	13.30	6.90	4.75	30.50	61.32
5	0.57	0.50	1.80	3.00	13.30	6.90	4.75	28.00	58.82
6	0.57	2.50	1.60	3.00	14.25	6.90	4.75	32.50	66.07
7	0.57	4.00	3.10	3.00	14.25	6.90	7.60	34.00	73.42
8	0.57	5.00	4.20	3.00	14.25	6.90	7.60	38.00	79.52
9	0.57	5.00	3.10	3.00	14.25	6.90	7.60	40.84	81.26
10	0.57	5.00	3.10	3.00	14.25	6.90	7.60	35.34	75.76
11	0.57	5.00	3.10	3.00	14.25	6.90	7.60	33.34	73.76
12	0.57	5.00	2.40	3.00	14.25	6.90	7.60	35.84	75.56
P.M. 1	0.57	5.00	2.40	3.00	14.25	6.90	7.60	35.18	74.90
2	0.57	3.30	2.40	3.00	14.25	6.90	7.60	39.8	80.30
3	0.57	5.00	2.40	3.00	14.25	6.90	7.60	40.00	79.72
4	0.57	5.00	4.20	3.00	14.25	6.90	7.60	33.50	75.02
5	0.57	5.00	4.20	3.00	14.25	6.90	7.60	35.34	76.86
6	0.57	4.00	4.20	3.00	13.30	6.90	4.75	28.84	65.56
7	0.57	2.50	4.20	3.00	13.30	6.90	4.75	26.84	62.04
8	0.57	1.50	4.20	3.00	13.30	6.90	4.75	26.84	61.06
9	0.57	1.00	4.20	3.00	13.30	6.90	4.75	29.84	63.56
10	0.57	1.00	2.50	3.00	13.30	6.90	4.75	27.34	59.36
11	0.57	1.00	1.90	3.00	13.30	6.90	4.75	26.34	57.76
12	0.57	1.00	1.80	3.00	13.30	6.90	4.75	24.84	56.16

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL GAY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: Summer

	EENT	L.S.U.		TULANE			YETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.14	0.30	0.50	2.00	11.40	5.10	3.80	32.34	56.08
2	0.14	0.30	0.50	2.00	11.40	5.10	3.80	33.34	56.58
3	0.14	0.30	0.50	2.00	11.40	5.10	3.80	32.34	55.58
4	0.14	0.30	0.50	2.00	11.40	5.10	3.80	32.34	55.58
5	0.19	0.30	0.50	2.00	11.40	5.10	3.80	32.34	55.63
6	0.19	0.30	1.60	2.40	13.30	5.10	3.80	34.34	61.03
7	0.19	2.00	2.30	2.40	13.30	5.10	3.80	38.50	67.59
8	0.19	3.00	1.60	2.40	13.30	5.10	6.70	40.50	72.79
9	0.19	3.00	1.60	2.40	13.30	5.10	6.70	36.18	68.47
10	0.19	3.30	1.60	2.40	13.30	5.10	6.70	34.68	65.97
11	0.19	3.00	1.00	2.40	13.30	5.10	6.70	37.34	69.03
12	0.19	3.00	1.00	2.40	13.30	5.10	6.70	35.34	67.03
P.M. 1	0.19	3.00	1.00	2.40	13.30	5.10	6.70	35.34	67.03
2	0.19	3.00	1.30	2.40	13.30	5.10	6.70	34.84	66.53
3	0.19	3.00	1.00	2.40	13.30	5.10	6.70	36.00	67.69
4	0.19	3.00	2.30	2.40	13.30	5.10	6.70	34.50	67.49
5	0.19	3.00	2.30	2.40	13.30	5.10	6.70	35.50	69.49
6	0.19	2.00	2.30	2.40	11.40	5.10	3.80	35.50	62.69
7	0.19	1.50	2.30	2.40	11.40	5.10	3.80	36.50	63.19
8	0.19	1.50	2.30	2.00	11.40	5.10	3.80	35.00	61.29
9	0.19	1.00	1.60	2.00	11.40	5.10	3.80	34.50	59.59
10	0.19	0.80	1.00	2.00	11.40	5.10	3.80	34.50	58.79
11	0.19	0.60	0.50	2.00	11.40	5.10	3.80	36.18	59.75
12	0.14	0.40	0.50	2.00	11.40	5.10	3.80	38.18	61.50

ERDA - ICES  
COMPOSITE FOR EXISTING BUILDINGS  
TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: Winter

	EENT	L.S.U.		TULANE			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	1.14	8.00	4.40	3.60	14.25	11.10	16.50	31.50	90.49
2	1.14	8.00	4.40	3.60	14.25	11.10	16.50	29.00	87.99
3	1.14	8.00	4.40	3.60	14.25	11.10	16.50	27.00	85.99
4	1.14	8.00	4.40	3.60	14.25	11.10	16.50	29.50	88.49
5	1.14	10.00	4.40	3.60	14.25	11.10	16.50	34.50	95.49
6	1.14	15.00	6.50	3.60	15.20	11.10	16.50	28.50	97.54
7	1.14	15.00	7.60	3.60	15.20	11.10	16.50	46.00	116.14
8	1.14	15.00	6.20	3.60	15.20	11.10	16.50	30.00	96.74
9	1.14	15.00	6.00	3.60	15.20	11.10	16.50	29.50	96.04
10	1.14	15.00	6.00	3.60	15.20	11.10	16.50	29.00	97.54
11	1.14	15.00	5.00	3.60	15.20	11.10	16.50	29.84	97.38
12	1.14	15.00	5.00	3.60	15.20	11.10	16.50	24.84	92.38
P.M. 1	1.14	15.00	5.00	3.60	15.20	11.10	16.50	25.84	94.38
2	1.14	15.00	5.00	3.60	15.20	11.10	16.50	22.84	90.38
3	1.14	15.00	5.00	3.60	15.20	11.10	16.50	26.50	96.04
4	1.14	15.00	7.40	3.60	15.20	11.10	16.50	35.00	104.94
5	1.14	15.00	7.40	3.60	15.20	11.10	16.50	23.68	93.62
6	1.14	14.00	7.40	3.60	14.25	11.10	16.50	26.68	94.67
7	1.14	12.00	7.40	3.60	14.25	11.10	16.50	28.84	94.83
8	1.14	12.00	7.40	3.60	14.25	11.10	16.50	25.34	91.33
9	1.14	10.00	6.20	3.60	14.25	11.10	16.50	27.84	90.63
10	1.14	10.00	5.20	3.60	14.25	11.10	16.50	21.84	83.63
11	1.14	8.00	4.20	3.60	14.25	11.10	16.50	28.16	86.55
12	1.14	8.00	4.40	3.60	14.25	11.10	16.50	27.16	86.15

ERDA - ICES  
COMPOSITE FOR FUTURE ADDITIONS  
TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
STEAM - POUND/HOUR x 10<sup>3</sup>

Season: Spring (& Fall)

	L.S.U.		Tulane Med. Sch.	Vets Add.	Composite
	Basic Sc.	Amb. C.			
A.M. 1	0.67	0.31	5.06	1.19	7.23
2	0.67	0.31	5.06	1.19	7.23
3	0.67	0.31	5.06	1.19	7.23
4	0.67	0.31	5.06	1.19	7.23
5	0.67	0.31	5.06	1.19	7.23
6	3.35	1.56	5.06	1.19	11.16
7	3.38	2.80	5.06	1.90	14.82
8	6.70	3.13	5.06	1.90	16.79
9	6.70	3.13	5.06	1.90	16.79
10	6.70	3.13	5.06	1.90	16.79
11	6.70	3.13	5.06	1.90	16.79
12	6.70	3.13	5.06	1.90	16.79
P.M. 1	6.70	3.13	5.06	1.90	16.79
2	6.70	3.13	5.06	1.90	16.79
3	6.70	3.13	5.06	1.90	16.79
4	6.70	3.13	5.06	1.90	16.79
5	6.70	3.13	5.06	1.90	16.79
6	5.38	2.80	5.06	1.19	16.79
7	3.35	1.56	5.06	1.19	16.79
8	2.01	0.94	5.06	1.19	16.79
9	1.34	0.63	5.06	1.19	16.79
10	1.34	0.63	5.06	1.19	16.79
11	1.34	0.63	5.06	1.19	16.79
12	1.34	0.63	5.06	1.19	16.79

ERDA - ICES

COMPOSITE FOR FUTURE ADDITIONS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

STEAM - POUND/HOUR x 10<sup>3</sup>

Season: Summer

	L.S.U		Tulane Med. Sch.	Add.	Composite
	Basic Sc.	Amb. C.			
A.M. 1	0.40	0.19	4.64	0.95	6.18
2	0.40	0.19	4.64	0.95	6.18
3	0.40	0.19	4.64	0.95	6.18
4	0.40	0.19	4.64	0.95	6.18
5	0.40	0.19	4.64	0.95	6.18
6	0.40	0.19	4.64	0.95	6.18
7	2.68	1.25	4.64	0.95	9.52
8	4.02	1.88	4.64	1.68	12.22
9	4.02	1.88	4.64	1.68	12.22
10	4.02	1.88	4.64	1.68	12.22
11	4.02	1.88	4.64	1.68	12.22
12	4.02	1.88	4.64	1.68	12.22
P.M. 1	4.02	1.88	4.64	1.68	12.22
2	4.02	1.88	4.64	1.68	12.22
3	4.02	1.88	4.64	1.68	12.22
4	4.02	1.88	4.64	1.68	12.22
5	4.02	1.88	4.64	1.68	12.22
6	2.68	1.25	4.64	0.95	9.52
7	2.01	0.94	4.64	0.95	8.54
8	2.01	0.94	4.64	0.95	8.54
9	1.34	0.53	4.64	0.95	7.56
10	1.07	0.50	4.64	0.95	7.16
11	0.80	0.38	4.64	0.95	6.77
12	0.54	0.25	4.64	0.95	6.38

**ERDA - ICES**  
**COMPOSITE FOR FUTURE ADDITIONS**  
**TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE**  
**STEAM - POUND/HOUR x 10<sup>3</sup>**

Season: Winter

	L.S.U.		Tulane Med. Sch.	Vets Add.	Composite
	Basic Sc.	Amb. C.			
A.M. 1	10.72	5.00	7.30	4.13	27.15
2	10.72	5.00	7.30	4.13	27.15
3	10.72	5.00	7.30	4.13	27.15
4	10.72	5.00	7.30	4.13	27.15
5	13.40	6.25	7.30	4.13	31.08
6	20.10	9.38	7.30	4.13	40.91
7	20.10	9.38	7.30	4.13	40.91
8	20.10	9.38	7.30	4.13	40.91
9	20.10	9.38	7.30	4.13	40.91
10	20.10	9.38	7.30	4.13	40.91
11	20.10	9.38	7.30	4.13	40.91
12	20.10	9.38	7.30	4.13	40.91
P.M. 1	20.10	9.38	7.30	4.13	40.91
2	20.10	9.38	7.30	4.13	40.91
3	20.10	9.38	7.30	4.13	40.91
4	20.10	9.38	7.30	4.13	40.91
5	20.10	9.38	7.30	4.13	40.91
6	18.76	8.75	7.30	4.13	38.94
7	16.08	7.50	7.30	4.13	35.01
8	16.08	7.50	7.30	4.13	35.01
9	13.40	6.25	7.30	4.13	31.08
10	13.40	6.25	7.30	4.13	31.08
11	10.72	5.00	7.30	4.13	27.15
12	10.72	5.00	7.30	4.13	27.15

ERDA - ICES  
COMPOSITE FOR ALL BUILDINGS  
TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Spring (& Fall)

	Exist. Bldgs.	Future Additions	Composite-A11	
A.M.	1	3.29	1.09	4.38
	2	3.28	1.09	4.37
	3	3.28	1.09	4.37
	4	3.28	1.09	4.39
	5	3.39	1.09	4.48
	6	3.84	1.91	5.75
	7	3.95	2.10	6.05
	8	4.21	2.50	6.71
	9	4.62	2.70	7.32
	10	4.73	2.89	7.62
	11	4.74	2.89	7.63
	12	4.74	2.89	7.63
P.M.	1	4.93	2.89	7.82
	2	4.93	2.89	7.82
	3	4.55	2.89	7.44
	4	4.55	2.89	7.44
	5	4.74	2.77	7.51
	6	4.61	2.77	7.39
	7	4.45	2.57	7.02
	8	4.34	2.37	6.71
	9	4.19	2.04	6.23
	10	4.03	1.85	5.88
	11	3.88	1.63	5.51
	12	3.63	1.43	5.06

ERDA - ICES  
COMPOSITE FOR ALL BUILDINGS  
TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Summer

	Exist. Bldgs.	Future Additions	Composite-All
A.M. 1	6.37	2.04	8.41
2	6.36	2.04	8.40
3	6.35	2.04	8.39
4	6.65	2.63	9.28
5	6.66	2.63	9.29
6	7.28	3.34	10.62
7	7.15	3.34	10.49
8	7.51	3.86	11.37
9	7.95	3.86	11.81
10	8.18	4.06	12.24
11	8.00	4.06	12.06
12	8.02	4.06	12.08
P.M. 1	8.03	4.06	12.09
2	8.03	4.06	12.09
3	7.84	4.06	11.90
4	7.84	4.06	11.90
5	7.74	3.96	11.70
6	7.74	3.96	11.70
7	7.63	3.83	11.46
8	7.40	3.63	11.03
9	7.19	3.24	10.43
10	7.03	3.05	10.08
11	6.67	2.85	9.52
12	6.46	2.46	8.92

ERDA - ICES

COMPOSITE FOR ALL BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Winter

	Exist. Bldgs.	Future Additions	Composite-All
A.M. 1	1.97	0.76	2.73
2	1.97	0.76	2.73
3	1.97	0.76	2.73
4	1.97	0.76	2.73
5	1.97	0.76	2.73
6	2.24	0.95	3.19
7	2.34	1.16	3.50
8	2.53	1.53	4.06
9	2.66	1.53	4.19
10	2.82	1.75	4.57
11	3.11	1.77	4.88
12	3.11	1.77	4.88
P.M. 1	3.11	1.77	4.88
2	3.11	1.77	4.88
3	2.92	1.77	4.69
4	2.92	1.77	4.69
5	3.30	1.66	4.99
6	3.30	1.66	4.99
7	2.87	1.48	4.33
8	2.67	1.25	3.92
9	2.61	1.13	3.74
10	2.61	1.13	3.74
11	2.04	0.90	2.94
12	2.04	0.90	2.94

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Spring (& Fall)

	EENT	L.S.U.		Tulane			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.03	0.10	0.10	0.03	1.10	0.83	0.35	0.75	3.29
2	0.02	0.10	0.10	0.03	1.10	0.83	0.35	0.75	3.28
3	0.02	0.10	0.10	0.03	1.10	0.83	0.35	0.75	3.28
4	0.03	0.10	0.10	0.03	1.20	0.83	0.35	0.75	3.39
5	0.03	0.40	0.10	0.03	1.20	0.83	0.50	0.75	3.84
6	0.03	0.40	0.10	0.03	1.20	0.83	0.50	0.75	3.84
7	0.04	0.50	0.10	0.03	1.20	0.83	0.50	0.75	3.95
8	0.05	0.60	0.15	0.03	1.20	0.83	0.60	0.75	4.21
9	0.05	0.70	0.15	0.03	1.32	0.83	0.60	0.94	4.62
10	0.06	0.80	0.15	0.03	1.32	0.83	0.60	0.94	4.73
11	0.06	0.80	0.15	0.04	1.32	0.83	0.60	0.94	4.74
12	0.06	0.80	0.15	0.04	1.32	0.83	0.60	0.94	4.74
P.M. 1	0.06	0.80	0.15	0.04	1.32	0.83	0.60	1.13	4.93
2	0.06	0.80	0.15	0.03	1.32	0.83	0.50	1.13	4.93
3	0.06	0.80	0.15	0.04	1.32	0.83	0.60	0.75	4.55
4	0.06	0.80	0.15	0.04	1.32	0.83	0.60	0.75	4.55
5	0.06	0.80	0.15	0.04	1.32	0.83	0.60	0.94	4.74
6	0.05	0.80	0.15	0.04	1.20	0.83	0.50	0.94	4.61
7	0.05	0.70	0.15	0.03	1.20	0.83	0.55	0.94	4.45
8	0.04	0.60	0.15	0.03	1.20	0.83	0.55	0.94	4.34
9	0.04	0.50	0.15	0.03	1.20	0.83	0.50	0.94	4.19
10	0.03	0.40	0.10	0.03	1.20	0.83	0.50	0.94	4.03
11	0.03	0.30	0.10	0.03	1.20	0.83	0.45	0.94	3.88
12	0.03	0.20	0.10	0.03	1.10	0.83	0.40	0.94	3.63

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Summer

	EENT	L.S.U.		Tulane			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.12	0.30	0.15	0.08	1.75	1.58	0.70	1.69	6.37
2	0.11	0.30	0.15	0.08	1.75	1.58	0.70	1.69	6.36
3	0.10	0.30	0.15	0.08	1.75	1.58	0.70	1.69	6.35
4	0.10	0.50	0.15	0.08	1.75	1.58	0.70	1.69	6.65
5	0.11	0.60	0.15	0.08	1.75	1.58	0.70	1.69	6.66
6	0.12	0.80	0.20	0.08	1.86	1.58	0.95	1.69	7.28
7	0.13	0.80	0.25	0.08	1.86	1.58	0.95	1.50	7.15
8	0.14	0.90	0.25	0.08	1.86	1.58	1.20	1.50	7.51
9	0.15	0.90	0.30	0.08	1.86	1.58	1.20	1.88	7.95
10	0.17	1.00	0.30	0.08	1.97	1.58	1.20	1.88	8.18
11	0.18	1.00	0.30	0.08	1.97	1.58	1.20	1.69	8.00
12	0.19	1.00	0.30	0.09	1.97	1.58	1.20	1.69	8.02
P.M. 1	0.20	1.00	0.30	0.09	1.97	1.58	1.20	1.69	8.03
2	0.20	1.00	0.30	0.09	1.97	1.58	1.20	1.69	8.03
3	0.20	1.00	0.30	0.09	1.97	1.58	1.20	1.50	7.84
4	0.20	1.00	0.30	0.09	1.97	1.58	1.20	1.50	7.94
5	0.20	1.00	0.30	0.09	1.97	1.58	1.10	1.50	7.74
6	0.20	1.00	0.30	0.09	1.97	1.58	1.10	1.50	7.74
7	0.19	1.00	0.30	0.09	1.97	1.58	1.00	1.50	7.63
8	0.18	0.90	0.30	0.08	1.86	1.58	1.00	1.50	7.40
9	0.17	0.80	0.30	0.08	1.86	1.58	0.90	1.50	7.19
10	0.16	0.70	0.25	0.08	1.86	1.58	0.90	1.50	7.03
11	0.14	0.60	0.20	0.08	1.86	1.58	0.90	1.31	6.67
12	0.13	0.40	0.20	0.08	1.86	1.58	0.90	1.31	6.46

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Winter

	SEKT	L.S.U.		Tulane			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.02	0.10	0.00	0.00	0.77	0.33	0.00	0.75	1.97
2	0.02	0.10	0.00	0.00	0.77	0.33	0.00	0.75	1.97
3	0.02	0.10	0.00	0.00	0.77	0.33	0.00	0.75	1.97
4	0.02	0.10	0.00	0.00	0.77	0.33	0.00	0.75	1.97
5	0.02	0.10	0.00	0.00	0.77	0.33	0.00	0.75	1.97
6	0.03	0.10	0.00	0.00	0.87	0.33	0.16	0.75	2.24
7	0.03	0.20	0.00	0.00	0.87	0.33	0.16	0.75	2.34
8	0.04	0.30	0.00	0.00	0.87	0.33	0.24	0.75	2.53
9	0.04	0.30	0.00	0.00	1.00	0.33	0.24	0.75	2.55
10	0.04	0.40	0.00	0.00	1.00	0.33	0.30	0.75	2.82
11	0.04	0.40	0.00	0.00	1.00	0.33	0.40	0.94	3.11
12	0.04	0.40	0.00	0.00	1.00	0.33	0.40	0.94	3.11
P.M. 1	0.04	0.40	0.00	0.00	1.00	0.33	0.40	0.94	3.11
2	0.04	0.40	0.00	0.00	1.00	0.33	0.40	0.94	3.11
3	0.04	0.40	0.00	0.00	1.00	0.33	0.40	0.75	2.92
4	0.04	0.40	0.00	0.00	1.00	0.33	0.40	0.75	2.92
5	0.04	0.40	0.00	0.00	1.00	0.33	0.40	1.13	3.30
6	0.04	0.40	0.00	0.00	1.00	0.33	0.40	1.13	3.30
7	0.03	0.30	0.00	0.00	0.87	0.33	0.40	0.94	2.87
8	0.03	0.20	0.00	0.00	0.87	0.33	0.30	0.94	2.67
9	0.03	0.20	0.00	0.00	0.87	0.33	0.24	0.94	2.61
10	0.03	0.20	0.00	0.00	0.87	0.33	0.24	0.94	2.61
11	0.02	0.10	0.00	0.00	0.87	0.00	0.16	0.56	2.04
12	0.02	0.10	0.00	0.00	0.87	0.33	0.16	0.56	2.04

ERDA - ICES

COMPOSITE FOR FUTURE ADDITIONS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Spring (& Fall)

	L.S.U.		Tulane Med. Sch.	Vets Add.	Charity Add.	Composite
	Basic Sc.	Amb. C.				
A.M. 1	0.13	0.06	0.26	0.09	0.55	1.09
2	0.13	0.06	0.26	0.09	0.55	1.09
3	0.13	0.06	0.26	0.09	0.55	1.09
4	0.13	0.06	0.26	0.09	0.55	1.09
5	0.13	0.06	0.26	0.09	0.55	1.09
6	0.54	0.25	0.26	0.13	0.73	1.91
7	0.67	0.31	0.26	0.13	0.73	2.10
8	0.80	0.38	0.26	0.15	0.91	2.50
9	0.94	0.44	0.26	0.15	0.91	2.70
10	1.07	0.50	0.26	0.15	0.91	2.89
11	1.07	0.50	0.26	0.15	0.91	2.89
12	1.07	0.50	0.26	0.15	0.91	2.89
P.M. 1	1.07	0.50	0.26	0.15	0.91	2.89
2	1.07	0.50	0.26	0.15	0.91	2.89
3	1.07	0.50	0.26	0.15	0.91	2.89
4	1.07	0.50	0.26	0.15	0.91	2.89
5	1.07	0.50	0.26	0.15	0.79	2.77
6	1.07	0.50	0.26	0.15	0.79	2.77
7	0.94	0.44	0.26	0.14	0.79	2.57
8	0.80	0.38	0.26	0.14	0.79	2.37
9	0.67	0.31	0.26	0.13	0.67	2.04
10	0.54	0.25	0.26	0.13	0.67	1.85
11	0.40	0.19	0.26	0.11	0.67	1.63
12	0.27	0.13	0.26	0.10	0.67	1.43

ERDA - ICES  
COMPOSITE FOR FUTURE ADDITIONS  
TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Summer

	L.S.U.		Tulane Med. Sch.	Vets Add.	Charity Add.	Composite
	Basic Sc.	Amb. C.				
A.M. 1	0.40	0.19	0.49	0.18	0.78	2.04
2	0.40	0.19	0.49	0.18	0.78	2.04
3	0.40	0.19	0.49	0.18	0.78	2.04
4	0.80	0.38	0.49	0.18	0.78	2.63
5	0.80	0.38	0.49	0.18	0.78	2.63
6	1.07	0.50	0.49	0.24	1.04	3.34
7	1.07	0.50	0.49	0.24	1.04	3.34
8	1.07	0.50	0.49	0.24	1.30	3.34
9	1.21	0.56	0.49	0.30	1.30	3.86
10	1.34	0.63	0.49	0.30	1.30	4.06
11	1.34	0.63	0.49	0.30	1.30	4.06
12	1.34	0.63	0.49	0.30	1.30	4.06
P.M. 1	1.34	0.63	0.49	0.30	1.30	4.06
2	1.34	0.63	0.49	0.30	1.30	4.06
3	1.34	0.63	0.49	0.30	1.30	4.06
4	1.34	0.63	0.49	0.30	1.30	4.06
5	1.34	0.63	0.49	0.28	1.12	3.86
6	1.34	0.63	0.49	0.28	1.12	3.86
7	1.34	0.63	0.49	0.25	1.12	3.83
8	1.21	0.56	0.49	0.25	1.12	3.63
9	1.07	0.50	0.49	0.23	0.95	3.24
10	0.94	0.44	0.49	0.23	0.95	3.05
11	0.80	0.38	0.49	0.23	0.95	2.85
12	0.54	0.25	0.49	0.23	0.95	2.46

ERDA - ICES

COMPOSITE FOR FUTURE ADDITIONS

TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season: Winter

	L.S.U.		Tulane Med. Sch.	Vets Add.	Charity Add.	Composite
	Basic Sc.	Amb. C.				
A.M. 1	0.13	0.06	0.10	0.00	0.47	0.76
2	0.13	0.06	0.10	0.00	0.47	0.76
3	0.13	0.06	0.10	0.00	0.47	0.76
4	0.13	0.06	0.10	0.00	0.47	0.76
5	0.13	0.06	0.10	0.00	0.47	0.76
6	0.13	0.06	0.10	0.04	0.62	0.95
7	0.27	0.13	0.10	0.04	0.62	1.16
8	0.40	0.19	0.10	0.06	0.78	1.53
9	0.40	0.19	0.10	0.06	0.78	1.53
10	0.54	0.25	0.10	0.08	0.78	1.75
11	0.54	0.25	0.10	0.10	0.78	1.77
12	0.54	0.25	0.10	0.10	0.78	1.77
P.M. 1	0.54	0.25	0.10	0.10	0.78	1.77
2	0.54	0.25	0.10	0.10	0.78	1.77
3	0.54	0.25	0.10	0.10	0.78	1.77
4	0.54	0.25	0.10	0.10	0.78	1.77
5	0.54	0.25	0.10	0.10	0.67	1.66
6	0.54	0.25	0.10	0.10	0.67	1.66
7	0.40	0.19	0.10	0.10	0.67	1.46
8	0.27	0.13	0.10	0.08	0.67	1.25
9	0.27	0.13	0.10	0.06	0.57	1.13
10	0.27	0.13	0.10	0.06	0.57	1.13
11	0.13	0.06	0.10	0.04	0.57	0.90
12	0.13	0.06	0.10	0.00	0.57	0.86

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE

EQUIVALENT BTU/HOUR x 10<sup>6</sup>

Season: Spring (& Fall)

	Electric	Gas	Composite
A.M. 1	32.17	101.17	133.34
2	31.70	99.87	131.57
3	31.48	101.17	132.65
4	31.51	102.47	133.98
5	32.17	99.22	131.99
6	33.70	108.65	142.35
7	37.40	118.20	155.60
8	44.00	126.13	170.13
9	50.32	131.85	182.17
10	51.28	124.70	176.98
11	51.34	121.19	172.53
12	50.68	124.44	175.12
P.M. 1	50.50	127.04	177.54
2	50.09	132.24	182.33
3	48.84	126.39	175.23
4	47.23	120.28	167.51
5	39.02	126.13	165.15
6	35.07	111.44	146.51
7	33.05	106.89	139.94
8	31.99	105.59	137.58
9	31.13	108.84	139.97
10	30.71	103.38	134.09
11	30.20	101.30	131.50
12	29.75	99.22	128.97

ERDA - ICES  
COMPOSITE FOR EXISTING BUILDINGS  
TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE  
EQUIVALENT BTU/HOUR x 10<sup>6</sup>

Season: Summer

	Electric	Gas	Composite
A.M. 1	37.69	140.71	178.40
2	38.63	141.36	179.99
3	38.62	140.06	178.68
4	38.20	140.06	178.26
5	38.45	140.13	178.58
6	39.14	147.15	186.29
7	42.47	154.69	197.16
8	53.30	157.68	210.98
9	56.99	158.98	215.97
10	57.59	157.03	214.62
11	57.70	156.25	213.95
12	57.51	153.65	211.16
P.M. 1	57.34	153.65	210.99
2	57.87	153.00	210.87
3	58.11	151.05	209.16
4	56.01	150.79	206.80
5	54.96	151.39	206.35
6	48.80	145.87	194.67
7	42.23	146.50	188.73
8	40.37	144.03	184.40
9	40.20	141.82	182.02
10	39.53	140.78	180.31
11	39.10	138.57	177.67
12	37.88	140.84	178.72

ERDA - ICES  
COMPOSITE FOR EXISTING BUILDINGS  
TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE  
EQUIVALENT BTU/HOUR x 10<sup>6</sup>

Season: Winter

	Electric	Gas	Composite
A.M. 1	25.97	132.86	158.83
2	25.52	129.61	155.13
3	25.48	127.01	152.49
4	25.15	130.26	155.41
5	25.28	129.36	154.64
6	25.81	142.54	168.35
7	27.78	166.72	194.50
8	34.66	44.18	178.76
9	37.24	43.19	180.43
10	39.13	42.54	181.67
11	40.60	45.79	186.39
12	40.91	39.29	180.20
P.M. 1	40.83	141.89	182.72
2	40.61	136.69	177.30
3	40.84	140.59	181.43
4	39.80	152.16	191.96
5	34.30	144.36	178.66
6	31.85	145.73	177.58
7	31.39	142.48	173.87
8	30.35	37.41	167.76
9	29.54	36.50	166.04
10	27.93	27.40	155.33
11	27.34	24.80	152.14
12	26.57	23.76	150.33

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE

GAS - MCFH

Season: Spring (8 Fall)

	EENT	L.S.U.		TULANE			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.74	0.65	2.34	3.90	17.29	18.07	6.18	52.00	101.17
2	0.74	0.65	2.34	3.90	17.29	18.07	6.18	50.70	99.87
3	0.74	0.65	2.34	3.90	17.29	18.07	6.18	52.00	101.17
4	0.74	0.65	2.34	3.90	17.29	18.07	6.18	53.30	102.47
5	0.74	0.65	2.34	3.90	17.29	18.07	6.18	50.05	99.22
6	0.74	3.25	2.08	3.90	18.53	18.07	6.18	55.90	108.65
7	0.74	5.20	4.03	3.90	18.53	18.07	9.88	57.85	118.20
8	0.74	6.50	5.46	3.90	18.53	18.07	9.88	63.05	126.13
9	0.74	6.50	4.03	3.90	18.53	18.07	9.88	70.20	131.85
10	0.74	6.50	4.03	3.90	18.53	18.07	9.88	63.05	124.70
11	0.74	6.50	3.12	3.90	18.53	18.07	9.88	60.45	121.19
12	0.74	6.50	3.12	3.90	18.53	18.07	9.88	63.70	124.44
P.M. 1	0.74	6.50	3.12	3.90	18.53	18.07	9.88	66.30	127.04
2	0.74	6.50	3.12	3.90	18.53	18.07	9.88	71.50	132.24
3	0.74	6.50	3.12	3.90	18.53	18.07	9.88	65.65	126.39
4	0.74	6.50	5.46	3.90	18.53	18.07	9.88	57.20	120.28
5	0.74	6.50	5.46	3.90	18.53	18.07	9.88	63.05	126.13
6	0.74	5.20	5.46	3.90	17.29	18.07	6.18	54.60	111.44
7	0.74	3.25	5.46	3.90	17.29	18.07	6.18	52.00	106.89
8	0.74	1.95	5.46	3.90	17.29	18.07	6.18	52.00	105.59
9	0.74	1.30	5.46	3.90	17.29	18.07	6.18	55.90	108.84
10	0.74	1.30	3.25	3.90	17.29	18.07	6.18	52.65	103.38
11	0.74	1.30	2.47	3.90	17.29	18.07	6.18	51.35	101.30
12	0.74	1.30	2.34	3.90	17.29	18.07	6.18	49.40	99.22

ERDA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE

GAS - MCFH

Season: Summer

	EENT	L.S.U.		TULANE			VETS HOSP.	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	0.18	0.39	0.65	2.60	14.82	43.68	4.94	73.45	140.71
2	0.18	0.39	0.65	2.60	14.82	43.68	4.94	74.10	141.36
3	0.18	0.39	0.65	2.60	14.82	43.68	4.94	72.80	140.06
4	0.18	0.39	0.65	2.60	14.82	43.68	4.94	72.80	140.06
5	0.25	0.39	0.65	2.60	14.82	43.68	4.94	72.80	140.13
6	0.25	0.39	2.08	3.12	17.29	43.68	4.94	75.40	147.15
7	0.25	2.60	2.99	3.12	17.29	43.68	7.41	77.35	154.69
8	0.25	3.90	2.08	3.12	17.29	43.68	7.41	79.95	157.68
9	0.25	3.90	2.08	3.12	17.29	43.68	7.41	81.25	158.98
10	0.25	3.90	2.08	3.12	17.29	43.68	7.41	79.30	157.30
11	0.25	3.90	1.30	3.12	17.92	43.68	7.41	79.30	156.25
12	0.25	3.90	1.30	3.12	17.29	43.68	7.41	76.00	153.65
P.M. 1	0.25	3.90	1.30	3.12	17.29	43.68	7.41	76.70	153.65
2	0.25	3.90	1.30	3.12	17.29	43.68	7.41	76.05	153.00
3	0.25	3.90	1.30	3.12	17.29	43.68	7.41	74.10	151.05
4	0.25	3.90	2.99	3.12	17.29	43.68	7.41	72.15	150.79
5	0.25	3.90	2.99	3.12	17.29	43.68	7.41	74.75	153.39
6	0.25	2.60	2.99	3.14	14.82	43.68	4.94	73.45	145.87
7	0.25	1.95	2.99	3.12	14.82	43.68	4.94	74.75	146.50
8	0.25	1.95	2.99	2.60	14.82	43.68	4.94	72.80	144.03
9	0.25	1.30	2.08	2.60	14.82	43.68	4.94	72.15	141.82
10	0.25	1.04	1.30	2.60	14.82	43.68	4.94	72.15	140.78
11	0.25	0.78	0.65	2.60	14.82	43.68	4.94	70.85	138.57
12	0.18	0.52	0.65	2.60	14.82	43.68	4.94	73.45	140.84

ERDA - ICES  
COMPOSITE FOR EXISTING BUILDINGS  
TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE  
GAS - MCFH

Season: Winter

	EENT	L.S.U.		TULANE			NETS HOSP	CHARITY HOSP.	COMPOSITE
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			
A.M. 1	1.49	10.40	5.72	2.60	18.53	18.07	21.45	54.60	132.86
2	1.49	10.40	5.72	2.60	18.53	18.07	21.45	51.35	129.61
3	1.49	10.40	5.72	2.60	18.53	18.07	21.45	48.75	127.01
4	1.49	10.40	5.72	2.60	18.53	18.07	21.45	52.00	130.26
5	1.49	13.00	5.72	2.60	18.53	18.07	21.45	58.50	139.38
6	1.49	19.50	8.45	3.12	19.76	18.07	21.45	50.70	142.54
7	1.49	19.50	9.88	3.12	19.76	18.07	21.45	73.45	166.72
8	1.49	19.50	8.06	3.12	19.76	18.07	21.45	52.65	144.10
9	1.49	19.50	7.80	3.12	19.76	18.07	21.45	52.00	143.19
10	1.49	19.50	7.80	3.12	19.76	18.07	21.45	51.35	142.54
11	1.49	19.50	6.50	3.12	19.76	18.07	21.45	55.90	145.79
12	1.49	19.50	6.50	3.12	19.76	18.07	21.45	49.40	139.29
P.M. 1	1.49	19.50	6.50	3.12	19.76	18.07	21.45	52.00	141.89
2	1.49	19.50	6.50	3.12	19.76	18.07	21.45	46.80	136.69
3	1.49	19.50	6.50	3.12	19.76	18.07	21.45	50.70	140.59
4	1.49	19.50	9.62	3.12	19.76	18.07	21.45	59.15	152.16
5	1.49	19.50	9.62	3.12	19.76	18.07	21.45	51.35	144.36
6	1.49	18.20	9.62	3.12	18.53	18.07	21.45	55.25	145.73
7	1.49	15.60	9.62	3.12	18.53	18.07	21.45	54.60	142.48
8	1.49	15.60	9.62	2.60	18.53	18.07	21.45	50.05	137.41
9	1.49	13.00	8.06	2.60	18.53	18.07	21.45	53.30	136.50
10	1.49	13.00	6.76	2.60	18.53	18.07	21.45	45.50	127.40
11	1.49	10.40	5.46	2.60	18.53	18.07	21.45	46.80	124.80
12	1.49	10.40	5.72	2.60	18.53	18.07	21.45	45.50	123.76

		L.S.U.		Tulane		COMPOSITE				
		Env. Med.	Sch. Hosp.	Med. Sch.	MOSP. VETS	CHARITY MOSP.	KR			
		Res. H.					BTU x 10 <sup>6</sup>			
A.M. 1	107	1008	290	75	1300	1200	1525	3920	9425	32.17
2	107	966	276	75	1300	1200	1525	3940	9289	31.70
3	107	924	251	75	1300	1200	1525	3940	9222	31.48
4	107	924	241	75	1300	1200	1504	3880	9231	31.91
5	107	924	236	75	1300	1200	1504	4080	9426	32.17
6	107	924	241	75	1300	1200	1546	4480	9873	37.40
7	107	1260	233	75	1300	1200	1546	5760	10858	37.40
8	261	1302	238	75	2800	1200	1735	5280	12891	44.00
9	338	1638	253	269	2800	1980	1945	5520	14743	50.32
10	415	1750	266	269	2800	1980	1945	5600	15255	51.28
11	415	1820	254	269	2800	1980	1945	5560	15043	51.34
12	415	1862	259	269	2800	1980	1945	5320	14850	50.68
P.M. 1	415	1890	271	269	2800	1980	1892	5280	14797	50.50
2	415	1890	269	269	2800	1980	1892	5160	14675	50.09
3	415	1890	264	269	2800	1980	1892	4300	14310	48.54
4	415	1890	264	269	2800	1980	1840	4400	13838	47.23
5	415	1890	278	269	3000	1840	1840	4240	1432	39.02
6	261	1722	286	75	1300	1200	1630	3600	10274	35.07
7	107	1400	292	75	1300	1200	1630	3680	9684	33.05
8	107	1162	301	75	1300	1200	1588	3640	9373	31.99
9	107	1092	318	75	1300	1200	1588	3440	9120	31.13
10	107	1092	318	75	1300	1200	1546	3360	8998	30.71
11	107	994	346	75	1300	1200	1546	3280	8848	30.20
12	107	994	341	75	1300	1200	1500	3200	8717	29.75

Season: Spring (8 Fall)

ERDA - ICES  
 COMPOSITE FOR EXISTING BUILDINGS  
 TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE  
 ELECTRICAL ENERGY - KILOWATTS

**ERDA - ICES**  
**COMPOSITE FOR EXISTING BUILDINGS**  
**TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE**  
**ELECTRICAL ENERGY - KILOWATTS**

Season: Summer

		L.S.U.			Tulane			VETS HOSP.	CHARITY HOSP.	COMPOSITE	
		EENT	Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			KW	BTU x 10 <sup>6</sup>
A.M.	1	140	868	299	90	2000	1425	1700	4520	11042	37.69
	2	140	1204	278	90	2000	1425	1700	4480	11317	38.63
	3	140	1204	276	90	2000	1425	1700	4480	11315	38.62
	4	140	1204	274	90	2000	1425	1700	4360	11193	38.20
	5	140	1204	278	90	2000	1425	1700	4440	11277	38.45
	6	140	1274	278	90	2000	1425	1700	4560	11467	39.14
	7	240	1420	288	90	3500	2100	1700	5280	12443	42.47
	8	340	1482	276	140	3500	2100	1840	5840	15618	53.30
	9	480	1806	276	357	3500	2100	2260	5960	16699	56.99
	10	540	1876	282	357	3500	2100	2260	5960	16875	57.59
	11	540	1918	282	357	3500	2100	2288	5920	16905	57.70
	12	540	1946	280	357	3500	2100	2288	5840	16851	57.51
P.M.	1	540	1918	286	357	3500	2100	2260	5840	16801	53.34
	2	540	1946	317	357	3500	2100	2276	5920	16956	57.97
	3	540	2016	318	357	3500	2100	2276	5920	17027	58.11
	4	540	1988	319	357	3500	2100	2008	5600	16412	56.01
	5	540	1806	312	357	3500	2100	2220	5240	16075	54.86
	6	340	1610	329	146	3500	1425	1910	5040	14298	48.80
	7	140	1582	337	90	2000	1425	1840	4960	12374	42.23
	8	140	1106	347	90	2000	1425	1840	4880	11828	40.37
	9	140	1092	352	90	2000	1425	1840	4840	11779	40.20
	10	140	1036	348	90	2000	1425	1784	4760	11583	39.53
	11	140	1036	340	90	2000	1425	1784	4640	11455	39.10
	12	140	910	274	90	2000	1425	1700	4560	11099	37.88

EROA - ICES

COMPOSITE FOR EXISTING BUILDINGS

TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE

ELECTRICAL ENERGY- KILOWATTS

Season: Winter

	EENT	L.S.U.		Tulane			VETS HOSP.	CHARITY HOSP.	COMPOSITE	
		Med. Sch.	Res. H.	Env. Med.	Hosp.	Med. Sch.			KW	BTU x 10 <sup>6</sup>
A.M. 1	65	686	188	30	1200	1000	1400	3040	7609	25.97
2	65	616	167	30	1200	1000	1400	3000	7478	25.52
3	65	616	155	30	1200	1000	1400	3000	7466	25.48
4	65	616	153	30	1200	1000	1385	2920	7369	25.15
5	65	616	151	30	1200	1000	1385	2960	7407	25.28
6	65	630	148	30	1200	1000	1370	3120	7563	25.12
7	112	630	137	30	1200	1000	1370	3640	8139	25.78
8	157	700	174	40	2300	1000	1524	4160	10155	34.66
9	205	710	181	40	2300	1550	1524	4240	10910	37.24
10	252	1050	191	40	2300	1550	1662	4320	11465	39.13
11	252	1470	203	40	2300	1550	1662	4320	11897	40.60
12	252	1470	208	40	2300	1550	1708	4360	11988	40.92
P.M. 1	252	1470	184	40	2300	1550	1708	4360	11964	40.63
2	252	1470	188	40	2300	1550	1678	4320	11898	40.61
3	252	1470	217	40	2300	1550	1678	4360	11974	40.94
4	252	1450	222	40	2300	1550	1647	4080	11661	39.80
5	252	1470	236	30	1200	1550	1647	3840	10285	34.90
6	252	1400	246	30	1200	1000	1524	3680	9332	31.85
7	242	1260	251	30	1200	1000	1524	3680	9197	31.39
8	157	1120	251	30	1200	1000	1493	3640	8891	30.35
9	65	1050	256	30	1200	1000	1493	3560	8654	29.54
10	65	770	256	30	1200	1000	1462	3400	8183	27.93
11	65	770	204	30	1200	1000	1462	3280	8011	27.34
12	65	700	190	30	1200	1000	1400	3200	7765	26.57

ERDA - ICES  
COMPOSITE FOR FUTURE BUILDINGS  
TYPICAL DAY SERVICE DEMAND PROFILE  
"PURE" ELECTRICAL DEMAND - KILOWATTS

Basis: 3 watts per square foot

	L.S.U.		Tulane	VA		Composite
	Basic Sciences (11,250,000 KWH)	Amb Care (5,250,000 KWH)	Med. Con. Exp (2,700,000 KWH)	Addition (2,900,000 KWH)	Expansion (2,700,000 KWH)	
A.M. 1	770	475	175	275	250	1945
2	770	475	175	275	250	1945
3	770	475	175	275	250	1945
4	770	475	175	275	250	1945
5	770	475	175	275	250	1945
6	770	475	175	275	250	1945
7	770	475	175	275	250	1945
8	770	475	175	275	250	1945
9	2000	800	500	400	390	4090
10	2000	800	500	400	390	4090
11	2000	800	500	400	390	4090
12	2000	800	500	400	390	4090
P.M. 1	2000	800	500	400	390	4090
2	2000	800	500	400	390	4090
3	2000	800	500	400	390	4090
4	2000	800	500	400	390	4090
5	2000	800	500	400	390	4090
6	2000	800	500	400	390	4090
7	770	475	175	275	250	1945
8	770	475	175	275	250	1945
9	770	475	175	275	250	1945
10	770	475	175	275	250	1945
11	770	475	175	275	250	1945
12	770	475	175	275	250	1945

ERDA - ICES

CENT HOSPITAL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

SEASON		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	0.57	0.14	0.57	1.14
	2	0.57	0.14	0.57	1.14
	3	0.57	0.14	0.57	1.14
	4	0.57	0.14	0.57	1.14
	5	0.57	0.19	0.57	1.14
	6	0.57	0.19	0.57	1.14
	7	0.57	0.19	0.57	1.14
	8	0.57	0.19	0.57	1.14
	9	0.57	0.19	0.57	1.14
	10	0.57	0.19	0.57	1.14
	11	0.57	0.19	0.57	1.14
	12	0.57	0.19	0.57	1.14
P.M.	1	0.57	0.19	0.57	1.14
	2	0.57	0.19	0.57	1.14
	3	0.57	0.19	0.57	1.14
	4	0.57	0.19	0.57	1.14
	5	0.57	0.19	0.57	1.14
	6	0.57	0.19	0.57	1.14
	7	0.57	0.19	0.57	1.14
	8	0.57	0.19	0.57	1.14
	9	0.57	0.19	0.57	1.14
	10	0.57	0.19	0.57	1.14
	11	0.57	0.19	0.57	1.14
	12	0.57	0.14	0.57	1.14

ERDA - ICES

LSU - MEDICAL SCHOOL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER	
	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Sun.	
A.M.	1	0.5	0.5	0.3	0.3	0.5	0.5	8.0
	2	0.5	0.5	0.3	0.3	0.5	0.5	8.0
	3	0.5	0.5	0.3	0.3	0.5	0.5	8.0
	4	0.5	0.5	0.3	0.3	0.5	0.5	8.0
	5	0.5	0.5	0.3	0.3	0.5	0.5	10.0
	6	2.5	1.0	0.3	0.3	2.5	1.0	15.0
	7	4.0	2.0	2.0	1.0	4.0	2.0	15.0
	8	5.0	2.5	2.0	1.5	5.0	2.5	15.0
	9	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	10	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	11	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	12	5.0	2.5	3.0	1.5	5.0	2.5	15.0
P.M.	1	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	2	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	3	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	4	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	5	5.0	2.5	3.0	1.5	5.0	2.5	15.0
	6	4.0	2.5	2.0	1.5	4.0	2.5	14.0
	7	2.5	2.0	1.5	1.5	2.5	2.0	12.0
	8	1.5	1.5	1.5	1.0	1.5	1.5	12.0
	9	1.0	1.0	1.0	0.8	1.0	1.0	10.0
	10	1.0	1.0	0.8	0.6	1.0	1.0	10.0
	11	1.0	1.0	0.6	0.4	1.0	1.0	8.0
	12	1.0	1.0	0.4	0.3	1.0	1.0	8.0

EROA - ICES

LSU - RESIDENCE HALL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

SEASON	SPRING		SUMMER		FALL		WINTER	
	Mon.	Sun.	Mon.	Sun.	Mon.	Sun.	Mon.	Sun.
A.M.	1	1.8	0.5	1.8	1.8	4.4		
	2	1.8	0.5	1.8	1.8	4.4		
	3	1.8	0.5	1.8	1.8	4.4		
	4	1.8	0.5	1.8	1.8	4.4		
	5	1.8	0.5	1.8	1.8	4.4		
	6	1.6	1.6	1.6	1.6	6.5		
	7	3.1	2.3	3.1	3.1	7.6		
	8	4.2	1.6	4.2	4.2	6.2		
	9	3.1	1.6	3.1	3.1	6.0		
	10	3.1	1.6	3.1	3.1	6.0		
	11	3.1	1.0	3.1	3.1	5.0		
	12	2.4	1.0	2.4	2.4	5.0		
P.M.	1	2.4	1.0	2.4	2.4	5.0		
	2	2.4	1.0	2.4	2.4	5.0		
	3	2.4	1.0	2.4	2.4	5.0		
	4	4.2	2.3	4.2	4.2	7.4		
	5	4.2	2.3	4.2	4.2	7.4		
	6	4.2	2.3	4.2	4.2	7.4		
	7	4.2	2.3	4.2	4.2	7.4		
	8	4.2	2.3	4.2	4.2	7.4		
	9	4.2	1.6	4.2	4.2	6.2		
	10	2.5	1.0	2.5	2.5	5.2		
	11	1.9	0.5	1.9	1.9	4.2		
	12	1.8	0.5	1.8	1.8	4.4		

ERDA - ICES

TULANE - ENVIRONMENTAL MEDICINE

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

SEASON	SPRING		SUMMER		FALL		WINTER	
	Mon.	Sun.	Mon.	Sun.	Mon.	Sun.	Mon.	Sun.
A.M.	1	3.00	2.00	3.00	3.00	3.60		
	2	3.00	2.00	3.00	3.00	3.60		
	3	3.00	2.00	3.00	3.00	3.60		
	4	3.00	2.00	3.00	3.00	3.60		
	5	3.00	2.00	3.00	3.00	3.60		
	6	3.00	2.40	3.00	3.00	3.60		
	7	3.00	2.40	3.00	3.00	3.60		
	8	3.00	2.40	3.00	3.00	3.60		
	9	3.00	2.40	3.00	3.00	3.60		
	10	3.00	2.40	3.00	3.00	3.60		
	11	3.00	2.40	3.00	3.00	3.60		
	12	2.40	3.00	3.00	3.00	3.60		
P.M.	1	3.00	2.40	3.00	3.00	3.60		
	2	3.00	2.40	3.00	3.00	3.60		
	3	3.00	2.40	3.00	3.00	3.60		
	4	3.00	2.40	3.00	3.00	3.60		
	5	3.00	2.40	3.00	3.00	3.60		
	6	3.00	2.40	3.00	3.00	3.60		
	7	3.00	2.40	3.00	3.00	3.60		
	8	3.00	2.00	3.00	3.00	3.60		
	9	3.00	2.00	3.00	3.00	3.60		
	10	3.00	2.00	3.00	3.00	3.60		
	11	3.00	2.00	3.00	3.00	3.60		
	12	3.00	2.00	3.00	3.00	3.60		

ERDA - ICES

TULANE - HOSPITAL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

SEASON		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	13.30	11.40	13.30	14.25
	2	13.30	11.40	13.30	14.25
	3	13.30	11.40	13.30	14.25
	4	13.30	11.40	13.30	14.25
	5	13.30	11.40	13.30	14.25
	6	14.25	13.30	14.25	15.20
	7	14.25	13.30	14.25	15.20
	8	14.25	13.30	14.25	15.20
	9	14.25	13.30	14.25	15.20
	10	14.25	13.30	14.25	15.20
	11	14.25	13.30	14.25	15.20
	12	14.25	13.30	14.25	15.20
P.M.	1	14.25	13.30	14.25	15.20
	2	14.25	13.30	14.25	15.20
	3	14.25	13.30	14.25	15.20
	4	14.25	13.30	14.25	15.20
	5	14.25	13.30	14.25	15.20
	6	13.30	11.40	13.30	14.25
	7	13.30	11.40	13.30	14.25
	8	13.30	11.40	13.30	14.25
	9	13.30	11.40	13.30	14.25
	10	13.30	11.40	13.30	14.25
	11	13.30	11.40	13.30	14.25
	12	13.30	11.40	13.30	14.25

ERDA - ICES

TULANE - MEDICAL SCHOOL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

SEASON		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	6.90	5.10	6.90	11.10
	2	6.90	5.10	6.90	11.10
	3	6.90	5.10	6.90	11.10
	4	6.90	5.10	6.90	11.10
	5	6.90	5.10	6.90	11.10
	6	6.90	5.10	6.90	11.10
	7	6.90	5.10	6.90	11.10
	8	6.90	5.10	6.90	11.10
	9	6.90	5.10	6.90	11.10
	10	6.90	5.10	6.90	11.10
	11	6.90	5.10	6.90	11.10
	12	6.90	5.10	6.90	11.10
P.M.	1	6.90	5.10	6.90	11.10
	2	6.90	5.10	6.90	11.10
	3	6.90	5.10	6.90	11.10
	4	6.90	5.10	6.90	11.10
	5	6.90	5.10	6.90	11.10
	6	6.90	5.10	6.90	11.10
	7	6.90	5.10	6.90	11.10
	8	6.90	5.10	6.90	11.10
	9	6.90	5.10	6.90	11.10
	10	6.90	5.10	6.90	11.10
	11	6.90	5.10	6.90	11.10
	12	6.90	5.10	6.90	11.10

ERDA - ICES

VETERANS HOSPITAL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER		
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	
A.M.	1	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	2	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	3	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	4	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	5	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	6	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	7	7.60	5.70	3.80	3.80	7.60	5.70	16.5	16.5
	8	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	9	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	10	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	11	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	12	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
P.M.	1	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	2	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	3	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	4	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	5	7.60	5.70	6.70	4.70	7.60	5.70	16.5	15.0
	6	4.75	3.80	3.80	3.80	4.75	3.80	16.5	15.0
	7	4.75	3.80	3.80	3.80	4.75	3.80	16.5	15.0
	8	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	9	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	10	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	11	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5
	12	4.75	3.80	3.80	3.80	4.75	3.80	16.5	16.5

ERDA - ICES

CHARITY HOSPITAL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: SPRING (& FALL)

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
A.M. 1	29.50	29.50	26.50	22.84	16.66	19.68	22.34
2	28.50	33.50	24.50	23.34	16.16	18.18	22.84
3	29.50	33.00	25.00	22.84	18.18	19.34	22.84
4	30.50	29.50	25.00	22.84	19.68	23.84	22.84
5	28.00	32.00	27.00	23.84	23.18	24.34	21.84
6	32.50	35.00	31.00	22.84	20.18	24.84	27.84
7	34.00	33.50	29.00	23.34	24.18	29.84	35.84
8	38.00	38.00	31.50	23.34	23.18	28.84	34.84
9	40.84	37.50	33.84	23.84	25.68	36.34	27.66
10	35.34	41.50	30.84	22.34	21.68	34.34	25.66
11	33.34	36.16	31.84	20.18	20.68	35.34	30.18
12	35.84	36.16	34.84	26.18	20.18	25.34	35.18
1	35.18	41.50	32.18	28.18	17.66	22.34	32.68
2	39.18	41.00	30.68	28.68	20.66	24.34	29.68
3	40.00	39.00	34.50	30.68	17.68	24.34	27.18
4	33.50	36.50	33.50	25.68	19.18	23.34	26.68
5	35.34	35.50	31.34	23.68	18.68	23.34	22.16
6	28.84	36.50	29.84	25.18	19.68	23.84	21.66
7	26.84	33.50	29.84	21.18	21.34	19.18	21.66
8	26.84	32.50	26.34	22.18	18.84	18.18	19.16
9	29.84	29.50	25.34	22.18	19.34	22.84	20.68
10	27.34	34.50	23.34	20.68	20.34	23.34	21.16
11	26.34	29.50	24.34	23.34	21.84	23.84	22.84
12	24.84	31.00	23.84	23.84	19.34	22.34	22.34

ERDA - ICES

CHARITY HOSPITAL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season: SUMMER

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
A.M. 1	32.84	38.66	36.00	31.34	39.16	28.00	26.00
2	33.34	38.66	34.50	32.34	38.16	28.50	27.00
3	32.34	35.50	42.18	31.34	39.66	28.50	31.18
4	32.34	35.50	43.18	30.34	38.16	29.50	32.18
5	32.34	36.50	43.18	31.34	39.66	33.16	33.18
6	34.34	39.00	43.18	35.34	40.66	32.16	32.18
7	38.50	40.50	42.00	40.50	38.00	31.50	29.50
8	40.50	43.50	43.50	42.00	37.50	30.00	29.50
9	36.18	41.00	39.84	35.17	37.84	29.00	29.00
10	34.68	40.00	39.84	35.67	36.34	33.50	36.00
11	37.34	46.16	40.50	37.34	39.50	32.00	34.00
12	35.34	41.16	40.50	34.34	40.00	32.50	31.50
1	35.34	40.00	39.00	37.84	38.34	33.00	32.00
2	34.84	38.00	40.50	37.84	37.84	30.00	28.00
3	36.00	38.66	36.84	38.00	31.34	28.50	24.34
4	34.50	41.16	36.34	37.00	34.34	29.00	25.34
5	36.50	39.66	35.34	35.00	35.34	31.00	28.50
6	35.50	39.66	34.84	33.50	34.34	29.00	27.50
7	36.50	38.66	35.84	36.50	37.00	32.16	27.00
8	35.00	38.66	35.84	36.50	38.50	30.66	26.00
9	34.50	36.00	34.84	35.50	37.50	30.66	32.18
10	34.50	37.00	35.84	34.00	38.00	31.16	32.68
11	36.16	34.84	34.84	34.16	36.00	27.50	29.16
12	38.16	33.34	33.84	35.16	35.50	26.50	29.16

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
A.M. 1	31.50	25.16	24.16	18.00	31.66	26.84	26.50
2	29.00	23.16	23.16	18.00	32.16	27.34	27.50
3	27.00	28.66	21.50	18.50	30.50	29.50	31.66
4	29.50	27.16	20.50	18.50	31.50	31.50	31.16
5	34.50	28.16	20.50	14.00	33.66	31.50	30.66
6	28.50	31.16	27.00	18.00	38.16	29.50	31.16
7	46.00	31.50	26.50	22.50	34.66	33.50	35.16
8	30.00	30.00	34.00	25.00	35.66	32.50	45.16
9	29.50	32.50	22.00	27.50	34.00	36.50	44.66
10	29.00	36.00	21.50	27.00	35.00	35.00	41.16
11	29.84	29.00	25.50	16.34	35.50	28.68	41.25
12	24.84	30.50	18.50	13.84	34.50	29.18	44.75
1	26.84	36.50	26.00	19.84	24.84	30.18	31.16
2	22.84	32.50	28.50	19.84	28.34	27.18	42.16
3	28.50	30.00	28.50	25.50	24.68	30.68	37.16
4	35.00	26.50	23.50	26.50	23.18	25.18	32.16
5	23.68	30.25	22.50	19.18	21.50	24.18	35.50
6	26.68	31.25	24.50	18.68	30.50	25.68	32.50
7	28.34	27.16	22.00	21.34	27.84	24.68	27.00
8	25.34	25.66	21.50	16.34	25.34	24.18	27.50
9	27.84	30.16	21.00	15.34	27.50	22.18	30.66
10	21.80	25.66	20.50	15.84	26.50	25.18	28.16
11	28.16	28.66	21.00	22.66	23.84	28.00	31.25
12	27.16	25.66	20.50	19.16	26.19	26.50	31.25

Season: WINTER

STEAM - POUNDS/HOUR x 10<sup>3</sup>

TYPICAL WEEKLY ENERGY DEMAND PROFILE

CHARITY HOSPITAL

ENDA - ICES

ERDA - ICES

LSU - BASIC SCIENCE (UNDER CONSTRUCTION)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season:		SPRING		SUMMER		FALL		WINTER
		Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Sun
A.M.	1	0.67	0.67	0.40	0.40	0.67	0.67	10.72
	2	0.67	0.67	0.40	0.40	0.67	0.67	10.72
	3	0.67	0.67	0.40	0.40	0.67	0.67	10.72
	4	0.67	0.67	0.40	0.40	0.67	0.67	10.72
	5	0.67	0.67	0.40	0.40	0.67	0.67	13.40
	6	3.35	1.34	0.40	0.40	3.35	1.34	20.10
	7	5.36	2.68	2.68	1.30	5.36	2.68	20.10
	8	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	9	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	10	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	11	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	12	6.70	3.35	4.02	2.01	6.70	3.35	20.10
P.M.	1	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	2	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	3	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	4	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	5	6.70	3.35	4.02	2.01	6.70	3.35	20.10
	6	5.36	3.35	2.68	2.01	5.36	3.35	18.76
	7	3.35	2.68	2.01	2.01	3.35	2.68	16.08
	8	2.01	2.01	2.01	1.34	2.01	2.01	16.08
	9	1.34	1.34	1.34	1.07	1.34	1.34	13.40
	10	1.34	1.34	1.07	0.80	1.34	1.34	13.40
	11	1.34	1.34	0.80	0.54	1.34	1.34	10.72
	12	1.34	1.34	0.54	0.40	1.34	1.34	10.72

ERDA - ICES

LSU - AMBULATORY CARE/CLINIC (FUTURE)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER	
	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Sun.	
A.M.	1	0.31	0.31	0.19	0.19	0.31	0.31	5.00
	2	0.31	0.31	0.19	0.19	0.31	0.31	5.00
	3	0.31	0.31	0.19	0.19	0.31	0.31	5.00
	4	0.31	0.31	0.19	0.19	0.31	0.31	5.00
	5	0.31	0.31	0.19	0.19	0.31	0.31	6.25
	6	1.56	0.63	0.19	0.19	1.56	0.63	9.38
	7	2.50	1.25	1.25	0.63	2.50	1.25	9.38
	8	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	9	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	10	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	11	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	12	3.13	1.56	1.88	0.94	3.13	1.56	9.38
P.M.	1	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	2	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	3	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	4	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	5	3.13	1.56	1.88	0.94	3.13	1.56	9.38
	6	2.50	1.56	1.25	0.94	2.50	1.56	8.75
	7	1.56	1.25	0.94	0.94	1.56	1.25	7.50
	8	0.94	0.94	0.94	0.63	0.94	0.94	7.50
	9	0.63	0.63	0.63	0.50	0.63	0.63	6.25
	10	0.63	0.63	0.50	0.38	0.63	0.63	6.25
	11	0.63	0.63	0.38	0.25	0.63	0.63	5.00
	12	0.63	0.63	0.25	0.19	0.63	0.63	5.00

ERDA - ICES

TULANE - MEDICAL SCHOOL (FUTURE)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

SEASON		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	5.06	4.64	5.06	7.30
	2	5.06	4.64	5.06	7.30
	3	5.06	4.64	5.06	7.30
	4	5.06	4.64	5.06	7.30
	5	5.06	4.64	5.06	7.30
	6	5.06	4.64	5.06	7.30
	7	5.06	4.64	5.06	7.30
	8	5.06	4.64	5.06	7.30
	9	5.06	4.64	5.06	7.30
	10	5.06	4.64	5.06	7.30
	11	5.06	4.64	5.06	7.30
	12	5.06	4.64	5.06	7.30
P.M.	1	5.06	4.06	5.06	7.30
	2	5.06	4.06	5.06	7.30
	3	5.06	4.06	5.06	7.30
	4	5.06	4.06	5.06	7.30
	5	5.06	4.06	5.06	7.30
	6	5.06	4.06	5.06	7.30
	7	5.06	4.06	5.06	7.30
	8	5.06	4.06	5.06	7.30
	9	5.06	4.06	5.06	7.30
	10	5.06	4.06	5.06	7.30
	11	5.06	4.06	5.06	7.30
	12	5.06	4.06	5.06	7.30

ERDA - ICES

VETERANS HOSPITAL (FUTURE ADDITION)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

STEAM - POUNDS/HOUR x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER		
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	
A.M.	1	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	2	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	3	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	4	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	5	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	6	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	7	1.90	1.43	0.95	0.95	1.90	1.43	4.13	4.13
	8	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	9	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	10	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	11	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	12	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
P.M.	1	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	2	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	3	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	4	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	5	1.90	1.43	1.68	1.18	1.90	1.43	4.13	3.75
	6	1.19	0.95	0.95	0.95	1.19	0.95	4.13	3.75
	7	1.19	0.95	0.95	0.95	1.19	0.95	4.13	3.75
	8	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	9	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	10	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	11	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13
	12	1.19	0.95	0.95	0.95	1.19	0.95	4.13	4.13

ERDA - ICES

EENT HOSPITAL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	0.03	0.12	0.03	0.02
	2	0.02	0.11	0.02	0.02
	3	0.02	0.10	0.02	0.02
	4	0.02	0.10	0.02	0.02
	5	0.03	0.11	0.03	0.02
	6	0.03	0.12	0.03	0.03
	7	0.04	0.13	0.04	0.03
	8	0.05	0.14	0.05	0.04
	9	0.05	0.15	0.05	0.04
	10	0.05	0.17	0.06	0.04
	11	0.05	0.18	0.06	0.04
	12	0.05	0.19	0.06	0.04
P.M.	1	0.06	0.20	0.06	0.04
	2	0.06	0.20	0.06	0.04
	3	0.06	0.20	0.06	0.04
	4	0.06	0.20	0.06	0.04
	5	0.06	0.20	0.06	0.04
	6	0.05	0.20	0.05	0.04
	7	0.05	0.19	0.05	0.03
	8	0.04	0.18	0.04	0.03
	9	0.04	0.17	0.04	0.03
	10	0.03	0.16	0.03	0.03
	11	0.03	0.14	0.03	0.02
	12	0.03	0.13	0.03	0.02

ERDA - ICES

LSU - MEDICAL SCHOOL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER	
	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Sun.	
A.M.	1	0.1	0.1	0.3	0.3	0.1	0.1	0.1
	2	0.1	0.1	0.3	0.3	0.1	0.1	0.1
	3	0.1	0.1	0.3	0.3	0.1	0.1	0.1
	4	0.1	0.1	0.6	0.5	0.1	0.1	0.1
	5	0.1	0.1	0.6	0.6	0.1	0.1	0.1
	6	0.4	0.3	0.8	0.6	0.4	0.3	0.1
	7	0.5	0.4	0.8	0.6	0.5	0.4	0.2
	8	0.6	0.5	0.9	0.6	0.6	0.5	0.3
	9	0.7	0.5	0.9	0.6	0.7	0.5	0.3
	10	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	11	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	12	0.8	0.5	1.0	0.6	0.8	0.5	0.4
P.M.	1	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	2	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	3	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	4	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	5	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	6	0.8	0.5	1.0	0.6	0.8	0.5	0.4
	7	0.7	0.4	1.0	0.6	0.7	0.4	0.3
	8	0.6	0.4	0.9	0.5	0.6	0.4	0.2
	9	0.5	0.4	0.8	0.4	0.5	0.4	0.2
	10	0.4	0.3	0.7	0.4	0.4	0.3	0.2
	11	0.3	0.3	0.6	0.3	0.3	0.3	0.1
	12	0.2	0.2	0.4	0.3	0.2	0.2	0.1

ERDA - ICES  
LSU - RESIDENCE HALL  
TYPICAL WEEKLY SERVICE DEMAND PROFILE  
AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:	SPRING	SUMMER	FALL	WINTER <sup>(1)</sup>	
	Mon.-Sun.	Mon.-Sun.	Mon.-Sun.	Mon.-Sun.	
A.M.	1	0.10	0.15	0.10	0.0
	2	0.10	0.15	0.10	0.0
	3	0.10	0.15	0.10	0.0
	4	0.10	0.15	0.10	0.0
	5	0.10	0.15	0.10	0.0
	6	0.10	0.20	0.10	0.0
	7	0.10	0.25	0.10	0.0
	8	0.15	0.25	0.15	0.0
	9	0.15	0.30	0.15	0.0
	10	0.15	0.30	0.15	0.0
	11	0.15	0.30	0.15	0.0
	12	0.15	0.30	0.15	0.0
P.M.	1	0.15	0.30	0.15	0.0
	2	0.15	0.30	0.15	0.0
	3	0.15	0.30	0.15	0.0
	4	0.15	0.30	0.15	0.0
	5	0.15	0.30	0.15	0.0
	6	0.15	0.30	0.15	0.0
	7	0.15	0.30	0.15	0.0
	8	0.15	0.30	0.15	0.0
	9	0.15	0.30	0.15	0.0
	10	0.10	0.25	0.10	0.0
	11	0.10	0.20	0.10	0.0
	12	0.10	0.20	0.10	0.0

(1) Economizer System; compressors are idle during winter months.

ERDA - ICES  
TULANE - ENVIRONMENTAL MEDICINE  
TYPICAL WEEKLY SERVICE DEMAND PROFILE  
AIR CONDITIONING - TONS 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER(1)	
	Mon.-Fri.	Sat. or Sun.	Mon.-Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Sun.	Mon.-Sun.	
A.M.	1	0.03	0.02	0.08	0.03	0.02	0.00	
	2	0.03	0.02	0.08	0.03	0.02	0.00	
	3	0.03	0.02	0.08	0.03	0.02	0.00	
	4	0.03	0.02	0.08	0.03	0.02	0.00	
	5	0.03	0.02	0.08	0.03	0.02	0.00	
	6	0.03	0.02	0.08	0.03	0.02	0.00	
	7	0.03	0.02	0.08	0.03	0.02	0.00	
	8	0.03	0.03	0.08	0.03	0.03	0.00	
	9	0.03	0.03	0.08	0.03	0.03	0.00	
	10	0.03	0.03	0.08	0.03	0.03	0.00	
	11	0.04	0.03	0.08	0.04	0.03	0.00	
	12	0.04	0.03	0.09	0.04	0.03	0.00	
P.M.	1	0.04	0.03	0.09	0.04	0.03	0.00	
	2	0.04	0.03	0.09	0.04	0.03	0.00	
	3	0.04	0.03	0.09	0.04	0.03	0.00	
	4	0.04	0.03	0.09	0.04	0.03	0.00	
	5	0.04	0.03	0.09	0.04	0.03	0.00	
	6	0.04	0.03	0.09	0.04	0.03	0.00	
	7	0.03	0.03	0.09	0.03	0.03	0.00	
	8	0.03	0.03	0.08	0.03	0.03	0.00	
	9	0.03	0.03	0.08	0.03	0.03	0.00	
	10	0.03	0.02	0.08	0.03	0.02	0.00	
	11	0.03	0.02	0.08	0.03	0.02	0.00	
	12	0.03	0.02	0.08	0.03	0.02	0.00	

(1) Economizer System; compressors are idle during winter months.

ERDA - ICES

TULANE - HOSPITAL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER		
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	
A.M.	1	1.10	1.10	1.75	1.75	1.10	1.10	0.77	0.77
	2	1.10	1.10	1.75	1.75	1.10	1.10	0.77	0.77
	3	1.10	1.10	1.75	1.75	1.10	1.10	0.77	0.77
	4	1.10	1.10	1.75	1.75	1.10	1.10	0.77	0.77
	5	1.20	1.10	1.75	1.75	1.20	1.10	0.77	0.77
	6	1.20	1.10	1.86	1.75	1.20	1.10	0.87	0.77
	7	1.20	1.10	1.86	1.86	1.20	1.10	0.87	0.77
	8	1.20	1.10	1.86	1.86	1.20	1.10	0.87	0.87
	9	1.32	1.20	1.86	1.86	1.32	1.20	1.00	0.87
	10	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	11	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	12	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
P.M.	1	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	2	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	3	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	4	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	5	1.32	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	6	1.20	1.20	1.97	1.86	1.32	1.20	1.00	0.87
	7	1.20	1.20	1.97	1.86	1.20	1.20	0.87	0.87
	8	1.20	1.20	1.86	1.86	1.20	1.20	0.87	0.87
	9	1.20	1.20	1.86	1.86	1.20	1.20	0.87	0.87
	10	1.20	1.20	1.86	1.86	1.20	1.20	0.87	0.87
	11	1.20	1.20	1.86	1.86	1.20	1.20	0.87	0.87
	12	1.10	1.10	1.86	1.86	1.10	1.10	0.87	0.77

ERDA - ICES

TULANE - MEDICAL SCHOOL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER		
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	
A.M.	1	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	2	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	3	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	4	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	5	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	6	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	7	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	8	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	9	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	10	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	11	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	12	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
P.M.	1	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	2	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	3	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	4	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	5	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	6	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	7	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	8	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	9	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	10	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	11	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17
	12	0.83	0.66	1.58	1.33	0.83	0.66	0.33	0.17

ERDA - ICES

VETERANS HOSPITAL

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Service:		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	0.35	0.70	0.35	0.00
	2	0.35	0.70	0.35	0.00
	3	0.35	0.70	0.35	0.00
	4	0.35	0.70	0.35	0.00
	5	0.35	0.70	0.35	0.00
	6	0.50	0.95	0.50	0.16
	7	0.50	0.95	0.50	0.16
	8	0.60	1.20	0.60	0.24
	9	0.60	1.20	0.60	0.24
	10	0.60	1.20	0.60	0.30
	11	0.60	1.20	0.60	0.40
	12	0.60	1.20	0.60	0.40
P.M.	1	0.60	1.20	0.60	0.40
	2	0.60	1.20	0.60	0.40
	3	0.60	1.20	0.60	0.40
	4	0.60	1.20	0.60	0.40
	5	0.60	1.30	0.60	0.40
	6	0.60	1.10	0.60	0.40
	7	0.55	1.00	0.55	0.40
	8	0.55	1.20	0.55	0.30
	9	0.50	0.90	0.50	0.24
	10	0.50	0.90	0.50	0.24
	11	0.45	0.90	0.45	0.16
	12	0.40	0.90	0.40	0.00

	P.M.						A.M.																		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
SUN.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938
SAT.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938
FRI.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938
THURS.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938
WED.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938
TUES.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938
MON.	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	1.125	1.313	1.125	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938

ENDA - ICES  
 CHARITY HOSPITAL  
 TYPICAL WEEKLY SERVICE DEMAND PROFILE  
 AIR CONDITIONING - TONS \* 10<sup>3</sup>

TYPICAL WEEK: SPRING ( & FALL )

	SUN.	SAT.	FRI.	THURS.	WED.	TUES.	MON.	
A.M.	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	2
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	3
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	4
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	5
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	6
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	7
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	8
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	9
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	10
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	11
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	12
P.M.	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	2
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	3
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	4
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	5
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	6
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	7
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	8
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	9
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	10
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	11
	1.500	1.500	1.500	1.500	1.500	1.500	1.500	12

TYPICAL WEEKLY SERVICE DEMAND PROFILE  
 AIR CONDITIONING - TONS X 10<sup>3</sup>

CHARITY HOSPITAL

ERDA - JCES

TYPICAL WEEK: SUMMER

	P.M.						A.M.																		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
MON.	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563
TUES.	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563
WED.	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563
THURS.	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563
FRI.	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.938	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563
SAT.	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
SUN.	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.563	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375

ERDA - ICES  
 CHARITY HOSPITAL  
 TYPICAL WEEKLY SERVICE DEMAND PROFILE  
 AIR CONDITIONING - TONS x 10<sup>3</sup>

TYPICAL WEEK: WINTER

ERDA - ICES

LSU - BASIC SCIENCE (UNDER CONSTRUCTION)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER	
	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	
A.M.	1	0.13	0.13	0.40	0.40	0.13	0.13	0.13
	2	0.13	0.13	0.40	0.40	0.13	0.13	0.13
	3	0.13	0.13	0.40	0.40	0.13	0.13	0.13
	4	0.13	0.13	0.80	0.67	0.13	0.13	0.13
	5	0.13	0.13	0.80	0.80	0.13	0.13	0.13
	6	0.54	0.40	1.07	0.80	0.54	0.40	0.13
	7	0.67	0.54	1.07	0.80	0.67	0.54	0.27
	8	0.80	0.67	1.21	0.80	0.80	0.67	0.40
	9	0.94	0.67	1.21	0.80	0.94	0.67	0.40
	10	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	11	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	12	1.07	0.67	1.34	0.80	1.07	0.67	0.54
P.M.	1	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	2	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	3	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	4	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	5	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	6	1.07	0.67	1.34	0.80	1.07	0.67	0.54
	7	0.94	0.54	1.34	0.80	0.94	0.54	0.40
	8	0.90	0.54	1.21	0.67	0.90	0.54	0.27
	9	0.67	0.54	1.07	0.54	0.67	0.54	0.27
	10	0.54	0.40	0.94	0.54	0.54	0.40	0.27
	11	0.40	0.40	0.80	0.40	0.40	0.40	0.13
	12	0.27	0.27	0.54	0.40	0.27	0.27	0.13

ERDA - ICES

LSU - AMBULATORY CARE/CLINIC (FUTURE)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER	
	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Fri.	Sat. or Sun.	Mon.-Sun.	
A.M.	1	0.06	0.06	0.19	0.19	0.06	0.06	0.06
	2	0.06	0.06	0.19	0.19	0.06	0.06	0.06
	3	0.06	0.06	0.19	0.19	0.06	0.06	0.06
	4	0.06	0.06	0.38	0.31	0.06	0.06	0.06
	5	0.06	0.06	0.38	0.38	0.06	0.06	0.06
	6	0.25	0.19	0.50	0.38	0.25	0.19	0.06
	7	0.31	0.25	0.50	0.38	0.31	0.25	0.13
	8	0.38	0.31	0.56	0.38	0.38	0.31	0.19
	9	0.44	0.31	0.56	0.38	0.44	0.31	0.19
	10	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	11	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	12	0.50	0.31	0.63	0.38	0.50	0.31	0.25
P.M.	1	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	2	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	3	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	4	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	5	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	6	0.50	0.31	0.63	0.38	0.50	0.31	0.25
	7	0.44	0.25	0.63	0.38	0.44	0.25	0.19
	8	0.38	0.25	0.56	0.31	0.38	0.25	0.13
	9	0.31	0.25	0.50	0.25	0.31	0.25	0.13
	10	0.25	0.19	0.44	0.25	0.25	0.19	0.13
	11	0.19	0.19	0.38	0.19	0.19	0.19	0.06
	12	0.13	0.13	0.25	0.19	0.13	0.13	0.06

ERDA - ICES

TULANE - MEDICAL SCHOOL (FUTURE)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

Season:	SPRING		SUMMER		FALL		WINTER		
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	
A.M.	1	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	2	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	3	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	4	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	5	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	6	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	7	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	8	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	9	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	10	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	11	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	12	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
P.M.	1	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	2	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	3	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	4	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	5	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	6	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	7	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	8	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	9	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	10	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	11	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06
	12	0.26	0.21	0.49	0.41	0.26	0.21	0.10	0.06

ERDA - ICES

VETERANS HOSPITAL (FUTURE ADDITION)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

SEASON		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	0.09	0.18	0.09	0.00
	2	0.09	0.18	0.09	0.00
	3	0.09	0.18	0.09	0.00
	4	0.09	0.18	0.09	0.00
	5	0.09	0.18	0.09	0.00
	6	0.13	0.24	0.13	0.04
	7	0.13	0.24	0.13	0.04
	8	0.15	0.30	0.15	0.06
	9	0.15	0.30	0.15	0.06
	10	0.15	0.30	0.15	0.08
	11	0.15	0.30	0.15	0.10
	12	0.15	0.30	0.15	0.10
P.M.	1	0.15	0.30	0.15	0.10
	2	0.15	0.30	0.15	0.10
	3	0.15	0.30	0.15	0.10
	4	0.15	0.30	0.15	0.10
	5	0.15	0.28	0.15	0.10
	6	0.15	0.28	0.15	0.10
	7	0.14	0.25	0.14	0.10
	8	0.14	0.25	0.14	0.08
	9	0.13	0.23	0.13	0.06
	10	0.13	0.23	0.13	0.06
	11	0.11	0.23	0.11	0.04
	12	0.10	0.23	0.10	0.00

ERDA - ICES

CHARITY HOSPITAL (FUTURE)

TYPICAL WEEKLY SERVICE DEMAND PROFILE

AIR CONDITIONING - TONS x 10<sup>3</sup>

SEASON		SPRING	SUMMER	FALL	WINTER
		Mon. - Sun.	Mon. - Sun.	Mon. - Sun.	Mon. - Sun.
A.M.	1	0.55	0.78	0.55	0.47
	2	0.55	0.78	0.55	0.47
	3	0.55	0.78	0.55	0.47
	4	0.55	0.78	0.55	0.47
	5	0.55	0.78	0.55	0.47
	6	0.73	1.04	0.73	0.62
	7	0.73	1.04	0.73	0.62
	8	0.91	1.30	0.91	0.78
	9	0.91	1.30	0.91	0.78
	10	0.91	1.30	0.91	0.78
	11	0.91	1.30	0.91	0.78
	12	0.91	1.30	0.91	0.78
P.M.	1	0.91	1.30	0.91	0.78
	2	0.91	1.30	0.91	0.78
	3	0.91	1.30	0.91	0.78
	4	0.91	1.30	0.91	0.78
	5	0.79	1.12	0.79	0.67
	6	0.79	1.12	0.79	0.67
	7	0.79	1.12	0.79	0.67
	8	0.79	1.12	0.79	0.67
	9	0.67	0.95	0.67	0.57
	10	0.67	0.95	0.67	0.57
	11	0.67	0.95	0.67	0.57
	12	0.67	0.95	0.67	0.57

ERDA - ICES

EENT HOSPITAL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season	Spring Mon. - Sun.	Summer Mon. - Sun.	Fall Mon. - Sun.	Winter Mon. - Sun.
A.M. 1	0.742	0.182	0.742	1.485
2	0.742	0.182	0.742	1.485
3	0.742	0.182	0.742	1.485
4	0.742	0.182	0.742	1.485
5	0.742	0.247	0.742	1.485
6	0.742	0.247	0.742	1.485
7	0.742	0.247	0.742	1.485
8	0.742	0.247	0.742	1.485
9	0.742	0.247	0.742	1.485
10	0.742	0.247	0.742	1.485
11	0.742	0.247	0.742	1.485
12	0.742	0.247	0.742	1.485
P.M. 1	0.742	0.245	0.742	1.485
2	0.742	0.245	0.742	1.485
3	0.742	0.245	0.742	1.485
4	0.742	0.245	0.742	1.485
5	0.742	0.245	0.742	1.485
6	0.742	0.245	0.742	1.485
7	0.742	0.245	0.742	1.485
8	0.742	0.245	0.742	1.485
9	0.742	0.245	0.742	1.485
10	0.742	0.245	0.742	1.485
11	0.742	0.247	0.742	1.485
12	0.742	0.182	0.742	1.485

ERDA - ICES

L.S.U. - MEDICAL SCHOOL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season	Spring		Summer		Fall		Winter
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Sun
A.M. 1	0.65	0.65	0.39	0.39	0.65	0.65	10.40
2	0.65	0.65	0.39	0.39	0.65	0.65	10.40
3	0.65	0.65	0.39	0.39	0.65	0.65	10.40
4	0.65	0.65	0.39	0.39	0.65	0.65	10.40
5	0.65	0.65	0.39	0.39	0.65	0.65	13.00
6	3.25	1.30	0.39	0.39	3.25	1.30	19.50
7	5.20	2.60	2.60	1.30	5.20	2.60	19.50
8	6.50	3.25	3.90	1.95	6.50	3.25	19.50
9	6.50	3.25	3.90	1.95	6.50	3.25	19.50
10	6.50	3.25	3.90	1.95	6.50	3.25	19.50
11	6.50	3.25	3.90	1.95	6.50	3.25	19.50
12	6.50	3.25	3.90	1.95	6.50	3.25	19.50
P.M. 1	6.50	3.25	3.90	1.95	6.50	3.25	19.50
2	6.50	3.25	3.90	1.95	6.50	3.25	19.50
3	6.50	3.25	3.90	1.95	6.50	3.25	19.50
4	6.50	3.25	3.90	1.95	6.50	3.25	19.50
5	6.50	3.25	3.90	1.95	6.50	3.25	19.50
6	5.20	3.25	2.60	1.95	5.20	3.25	18.20
7	3.25	2.60	1.95	1.95	3.25	2.60	15.60
8	1.95	1.95	1.95	1.30	1.95	1.95	15.60
9	1.30	1.30	1.30	1.04	1.30	1.30	13.00
10	1.30	1.30	1.04	0.78	1.30	1.30	13.00
11	1.30	1.30	0.78	0.52	1.30	1.30	10.40
12	1.30	1.30	0.52	0.39	1.30	1.30	10.40

ERDA - ICES

L.S.U. - RESIDENCE HALL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season	Spring Mon. - Sun.	Summer Mon. - Sun.	Fall Mon. - Sun.	Winter Mon. - Sun.
A.M. 1	2.34	0.65	2.34	5.72
2	2.34	0.65	2.34	5.72
3	2.34	0.65	2.34	5.72
4	2.34	0.65	2.34	5.72
5	2.34	0.65	2.34	5.72
6	2.08	2.08	2.08	8.45
7	4.03	2.99	4.03	9.88
8	5.46	2.08	5.46	8.06
9	4.03	2.08	4.03	7.80
10	4.03	2.08	4.03	7.80
11	4.03	1.30	4.03	6.50
12	3.12	1.30	3.12	6.50
P.M. 1	2.34	0.65	2.34	5.72
2	2.34	0.65	2.34	5.72
3	3.12	1.30	3.12	6.50
4	5.46	2.99	5.46	9.62
5	5.46	2.99	5.46	9.62
6	5.46	2.99	5.46	9.62
7	5.46	2.99	5.46	9.62
8	5.46	2.99	5.46	9.62
9	5.46	2.08	5.46	8.06
10	3.25	1.30	3.25	6.76
11	2.47	0.65	2.47	5.46
12	2.34	0.65	2.34	5.72

ERDA - ICES

TULANE - ENVIRONMENTAL MEDICINE

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season	Spring Mon. - Sun.	Summer Mon. - Sun.	Fall Mon. - Sun.	Winter Mon. - Sun.
A.M. 1	3.90	2.60	3.90	2.60
2	3.90	2.60	3.90	2.60
3	3.90	2.60	3.90	2.60
4	3.90	2.60	3.90	2.60
5	3.90	2.60	3.90	2.60
6	3.90	3.12	3.90	3.12
7	3.90	3.12	3.90	3.12
8	3.90	3.12	3.90	3.12
9	3.90	3.12	3.90	3.12
10	3.90	3.12	3.90	3.12
11	3.90	3.12	3.90	3.12
12	3.90	3.12	3.90	3.12
P.M. 1	3.90	3.12	3.90	3.12
2	3.90	3.12	3.90	3.12
3	3.90	3.12	3.90	3.12
4	3.90	3.12	3.90	3.12
5	3.90	3.12	3.90	3.12
6	3.90	3.12	3.90	3.12
7	3.90	3.12	3.90	3.12
8	3.90	2.60	3.90	2.60
9	3.90	2.60	3.90	2.60
10	3.90	2.60	3.90	2.60
11	3.90	2.60	3.90	2.60
12	3.90	2.60	3.90	2.60

ERDA - ICES

TULANE - HOSPITAL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season	Spring Mon. - Sun.	Summer Mon. - Sun.	Fall Mon. - Sun.	Winter Mon. - Sun.
A.M. 1	17.29	14.82	17.29	18.53
2	17.29	14.82	17.29	18.53
3	17.29	14.82	17.29	18.53
4	17.29	14.82	17.29	18.53
5	17.29	14.82	17.29	18.53
6	18.53	17.29	18.53	19.76
7	18.53	17.29	18.53	19.76
8	18.53	17.29	18.53	19.76
9	18.53	17.29	18.53	19.76
10	18.53	17.29	18.53	19.76
11	18.53	17.29	18.53	19.76
12	18.53	17.29	18.53	19.76
P.M. 1	18.53	17.29	18.53	19.76
2	18.53	17.29	18.53	19.76
3	18.53	17.29	18.53	19.76
4	18.53	17.29	18.53	19.76
5	18.53	17.29	18.53	19.76
6	17.29	14.82	17.29	18.53
7	17.29	14.82	17.29	18.53
8	17.29	14.82	17.29	18.53
9	17.29	14.82	17.29	18.53
10	17.29	14.82	17.29	18.53
11	17.29	14.82	17.29	18.53
12	17.29	14.82	17.29	18.53

ERDA - ICES

TULANE - MEDICAL SCHOOL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season	Spring Mon. - Sun.	Summer Mon. - Sun.	Fall Mon. - Sun.	Winter Mon. - Sun.
A.M. 1	18.07	43.68	18.07	18.07
2	18.07	43.68	18.07	18.07
3	18.07	43.68	18.07	18.07
4	18.07	43.68	18.07	18.07
5	18.07	43.68	18.07	18.07
6	18.07	43.68	18.07	18.07
7	18.07	43.68	18.07	18.07
8	18.07	43.68	18.07	18.07
9	18.07	43.68	18.07	18.07
10	18.07	43.68	18.07	18.07
11	18.07	43.68	18.07	18.07
12	18.07	43.68	18.07	18.07
P.M. 1	18.07	43.68	18.07	18.07
2	18.07	43.68	18.07	18.07
3	18.07	43.68	18.07	18.07
4	18.07	43.68	18.07	18.07
5	18.07	43.68	18.07	18.07
6	18.07	43.68	18.07	18.07
7	18.07	43.68	18.07	18.07
8	18.07	43.68	18.07	18.07
9	18.07	43.68	18.07	18.07
10	18.07	43.68	18.07	18.07
11	18.07	43.68	18.07	18.07
12	18.07	43.68	18.07	18.07

ERDA - ICES

VETERANS HOSPITAL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFX

Season	Spring		Summer		Fall		Winter		
	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	Mon-Fri	Sat or Sun	
A.M.	1	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	2	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	3	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	4	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	5	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	6	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	7	9.88	7.41	4.94	4.94	9.88	7.41	21.45	21.45
	8	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	9	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	10	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	11	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	12	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
P.M.	1	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	2	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	3	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	4	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	5	9.88	7.41	8.71	6.11	9.88	7.41	21.45	19.50
	6	6.18	4.94	4.94	4.94	6.18	4.94	21.45	19.50
	7	6.18	4.94	4.94	4.94	6.18	4.94	21.45	19.50
	8	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	9	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	10	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	11	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45
	12	6.18	4.94	4.94	4.94	6.18	4.94	21.45	21.45

ERDA - ICES

CHARITY HOSPITAL

TYPICAL WEEKLY ENERGY DEMAND PROFILE

GAS - MCFH

Season: Spring (& Fall)

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
A.M. 1	52.00	52.00	48.10	46.80	45.50	46.15	46.15
2	50.70	57.20	45.50	47.45	44.85	44.20	46.80
3	52.00	56.55	46.15	46.80	44.20	42.25	46.80
4	53.30	52.00	46.15	46.80	46.15	48.10	46.80
5	50.05	55.25	48.75	48.10	50.70	48.75	45.50
6	55.90	59.15	53.95	46.80	46.80	49.40	53.30
7	57.85	57.20	51.35	47.45	52.00	55.90	63.70
8	63.05	63.05	54.60	47.45	50.70	54.60	62.40
9	70.20	62.40	61.10	48.10	53.95	64.35	59.80
10	63.05	67.60	57.20	46.15	48.75	61.75	57.20
11	60.45	57.20	58.50	46.80	47.45	63.05	59.80
12	63.70	57.20	62.40	54.60	46.80	50.05	56.30
P.M. 1	66.30	67.60	62.40	57.20	46.80	46.15	63.05
2	71.50	66.95	60.45	57.85	50.70	48.75	59.15
3	65.65	64.35	58.50	60.40	43.55	48.75	55.90
4	57.20	61.10	57.20	53.95	45.50	47.45	55.25
5	53.75	59.20	59.20	51.35	44.95	47.45	52.55
6	54.60	61.10	55.90	53.30	46.15	48.10	52.00
7	52.00	57.20	51.35	49.40	41.60	44.20	48.75
8	52.00	55.90	51.35	49.40	41.60	44.20	48.75
9	58.90	52.00	50.05	49.40	42.25	46.80	50.70
10	52.65	58.50	47.45	47.45	43.55	47.45	51.35
11	51.35	52.00	48.75	47.45	45.50	48.10	46.80
12	49.40	53.95	48.10	48.10	42.25	46.15	46.15

ERDA - ICES  
CHARITY HOSPITAL  
TYPICAL WEEKLY ENERGY DEMAND PROFILE  
GAS - MCFH

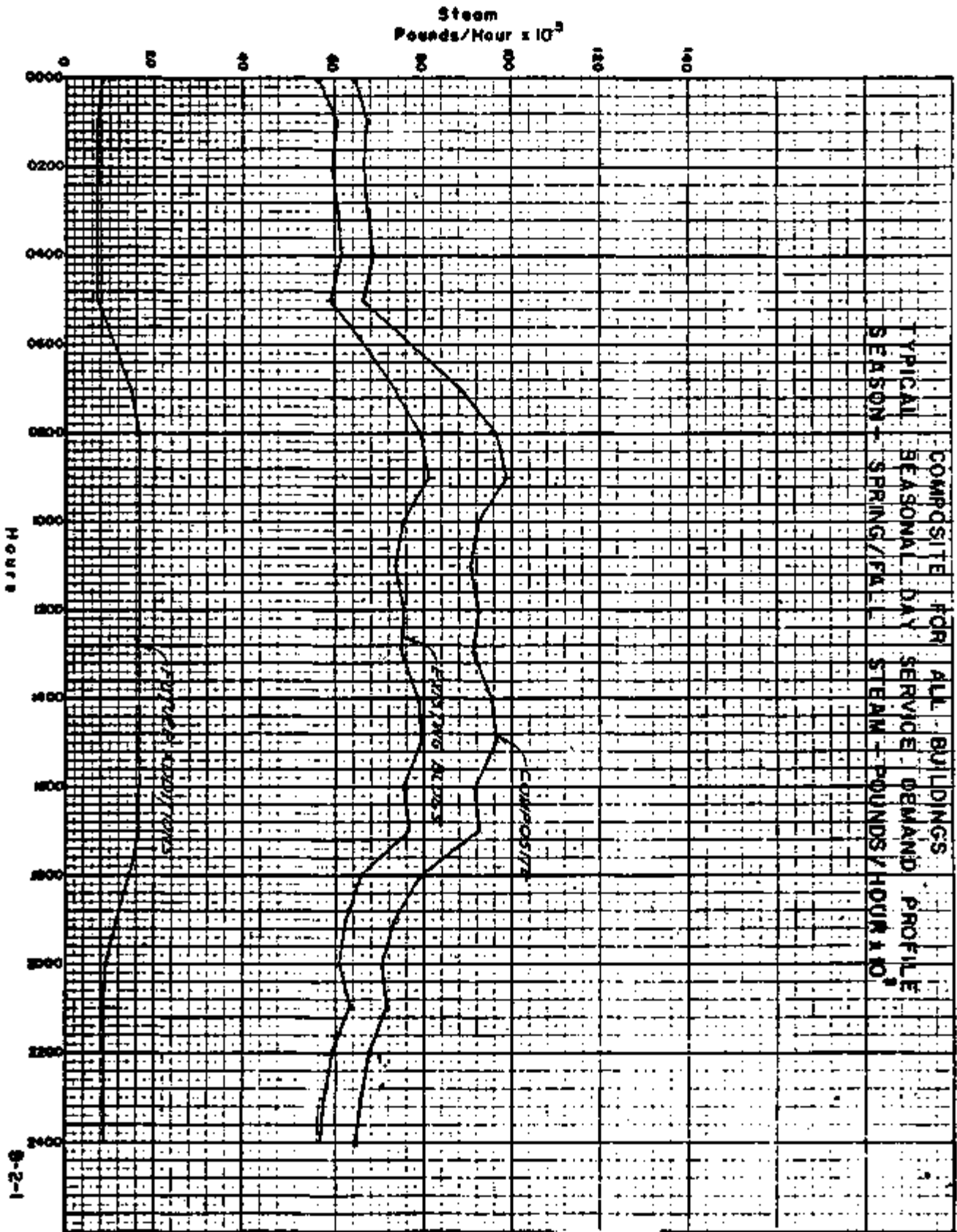
Season: Summer

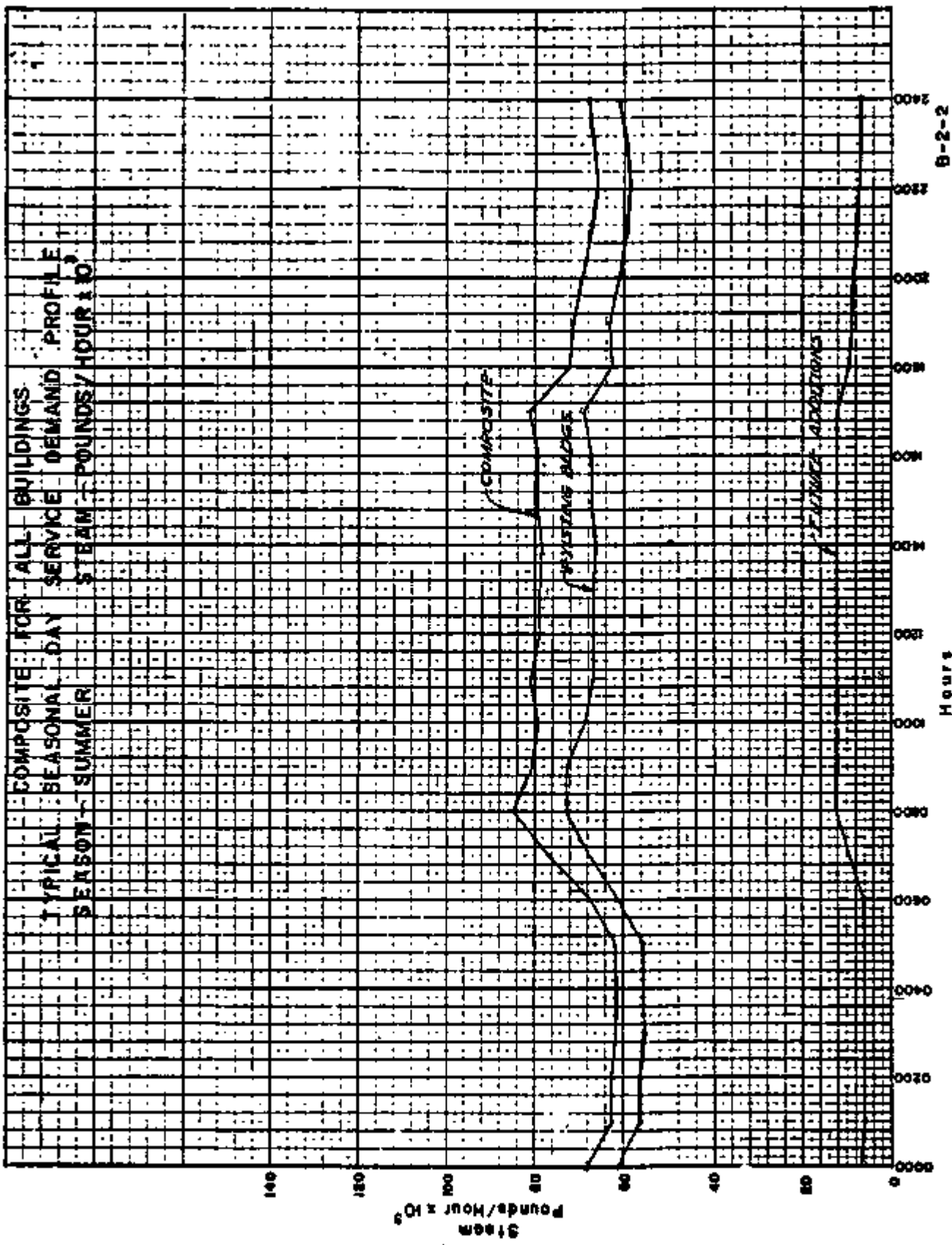
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
A.M. 1	73.45	74.10	74.10	71.50	74.75	63.70	61.10
2	74.10	74.10	72.15	72.80	73.45	64.35	62.40
3	72.80	73.45	75.40	71.50	75.40	64.35	61.10
4	72.80	73.45	76.70	70.20	73.45	65.65	62.40
5	72.80	74.75	76.70	71.50	75.40	66.95	63.70
6	75.40	76.00	76.70	76.70	76.70	65.65	62.40
7	77.35	79.95	81.90	79.95	76.70	68.25	65.65
8	79.95	83.85	83.85	81.90	76.05	66.30	65.65
9	81.25	80.60	82.55	79.95	79.95	65.00	65.00
10	79.30	79.30	82.55	80.60	78.00	70.65	74.10
11	79.30	83.85	79.95	79.30	78.65	62.90	71.50
12	76.70	77.35	79.95	75.40	79.30	69.55	66.25
P.M. 1	76.70	79.30	78.00	79.95	80.60	70.20	68.90
2	76.05	76.70	78.65	79.95	79.95	66.30	63.70
3	74.10	74.10	78.65	76.70	71.50	64.35	62.40
4	72.15	77.35	78.00	75.40	75.40	65.00	63.70
5	74.75	75.40	76.70	72.30	76.70	67.65	64.35
6	73.45	75.40	76.05	70.85	75.40	65.00	63.05
7	74.75	74.10	77.35	74.75	75.40	65.65	62.40
8	72.80	74.10	77.35	74.75	77.35	63.70	61.10
9	72.15	74.10	76.05	73.45	76.05	63.70	62.40
10	72.15	75.40	77.35	71.50	76.70	64.35	63.05
11	70.85	76.05	76.05	68.25	74.10	63.05	61.75
12	73.45	74.10	74.75	69.55	73.45	61.75	61.75

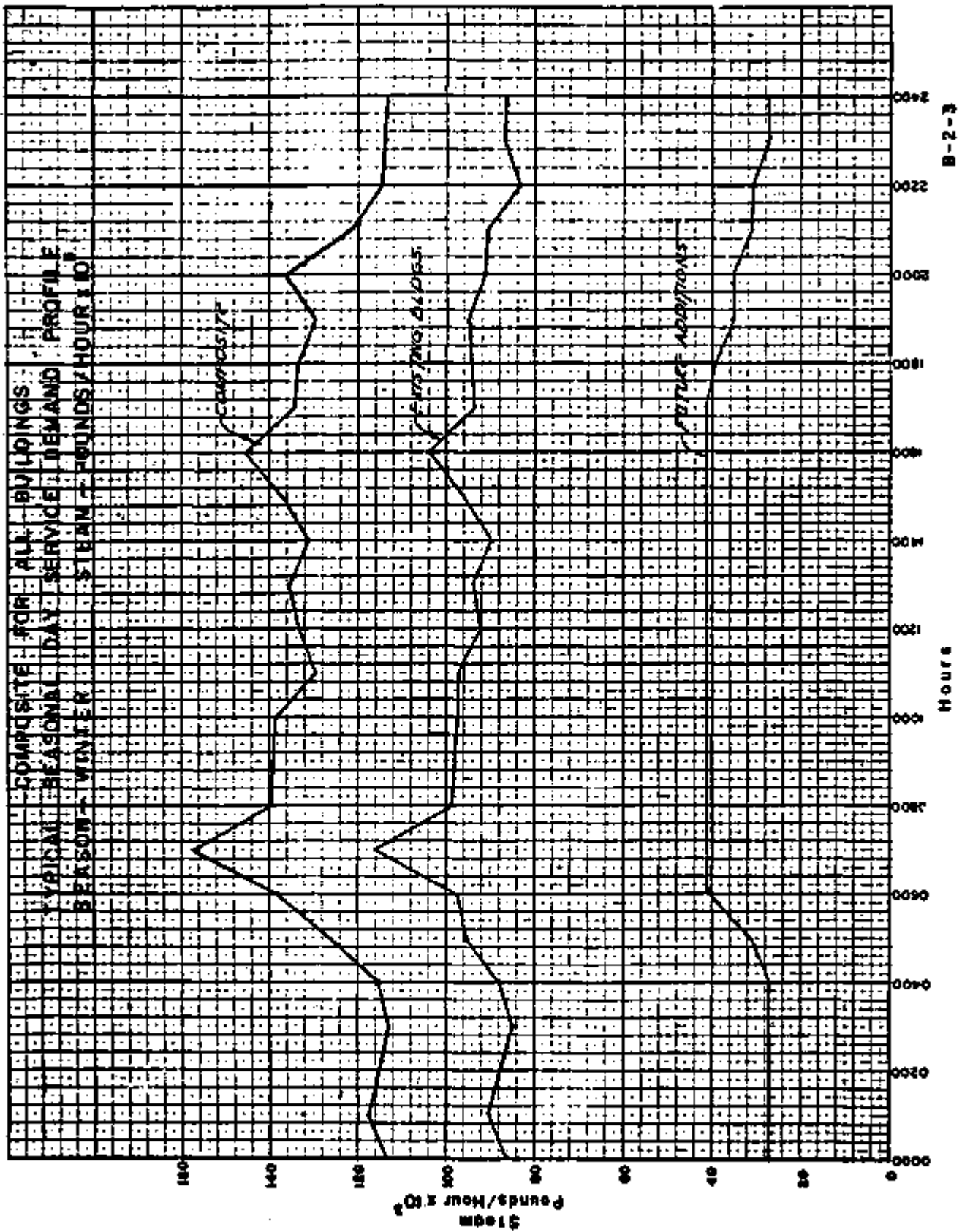
ERDA - ICES  
CHARITY HOSPITAL  
TYPICAL WEEKLY ENERGY DEMAND PROFILE  
GAS - MCFH

Season: Winter

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
A.M. 1	54.60	42.90	41.60	37.05	51.35	52.00	48.10
2	51.35	40.30	40.30	37.05	52.00	52.00	49.40
3	48.75	47.45	41.60	37.70	53.30	52.65	51.35
4	52.00	45.50	40.30	37.70	54.60	54.60	50.70
5	58.50	46.80	40.30	31.85	53.95	54.60	50.05
6	50.70	50.70	48.75	37.05	59.80	52.00	50.70
7	73.45	54.60	48.10	42.90	55.25	57.20	55.90
8	52.65	53.95	57.85	46.15	56.55	55.90	70.20
9	52.00	55.90	42.25	49.40	57.85	61.10	68.25
10	51.35	60.45	41.60	48.75	59.15	59.15	53.70
11	55.90	51.35	46.80	38.35	59.80	57.85	60.45
12	49.40	53.30	37.70	35.10	58.50	58.50	65.00
P.M. 1	52.00	61.10	47.45	42.90	49.40	59.80	50.70
2	46.80	55.90	50.70	42.90	53.95	55.90	65.00
3	50.70	52.65	50.70	46.30	52.65	60.45	58.50
4	59.15	48.10	44.20	46.10	59.70	55.30	52.00
5	51.35	46.15	42.90	45.50	54.60	52.00	59.80
6	55.25	47.45	45.50	42.25	53.30	53.95	55.90
7	54.60	45.50	42.25	44.85	53.30	52.65	48.75
8	50.50	43.55	41.60	38.35	50.05	52.00	49.40
9	53.30	49.40	40.95	37.05	49.40	49.40	50.05
10	46.50	43.55	40.30	37.70	48.10	53.30	46.80
11	46.80	47.45	40.95	39.65	48.10	50.05	48.10
12	45.50	43.55	40.30	35.10	51.35	48.10	47.45

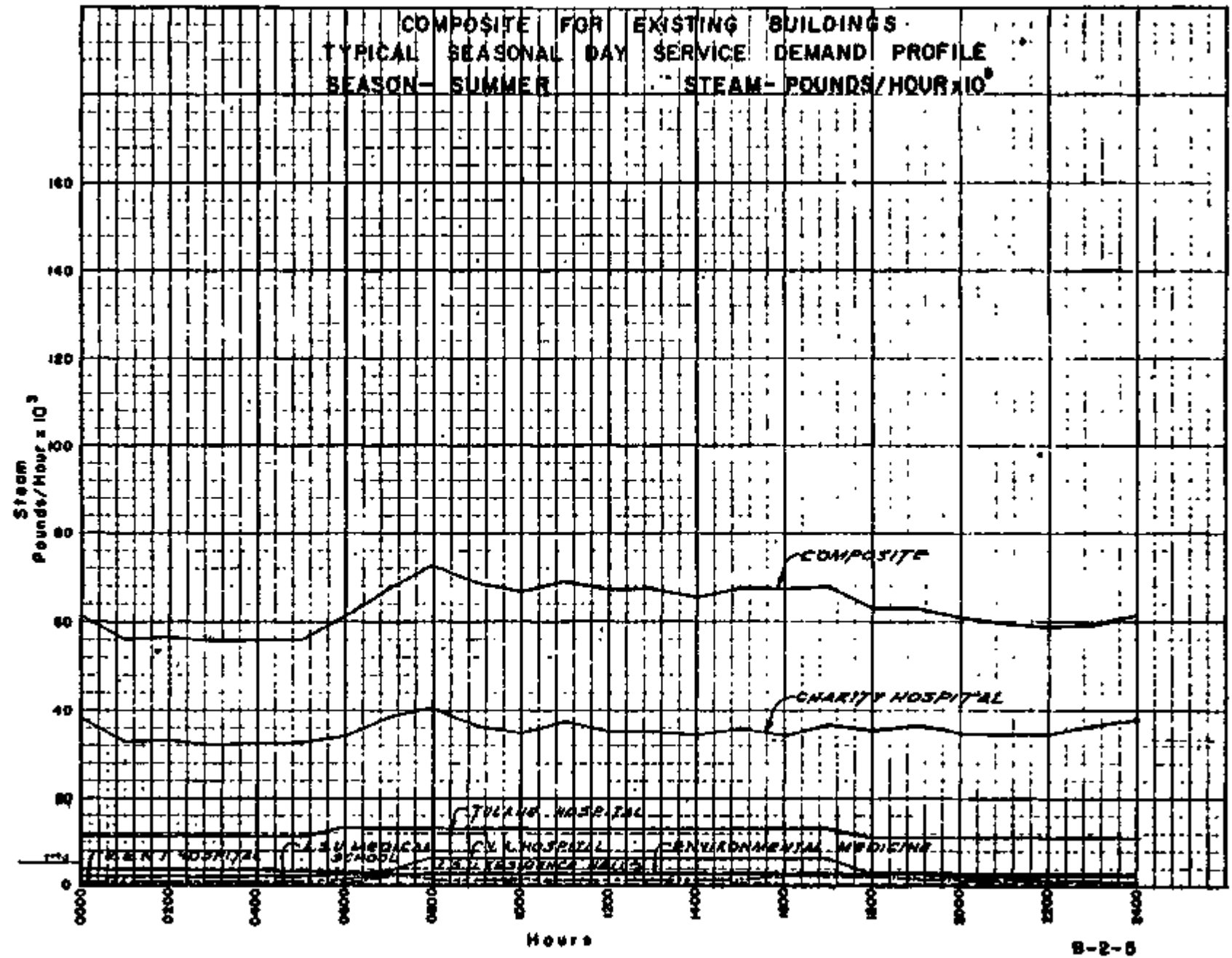






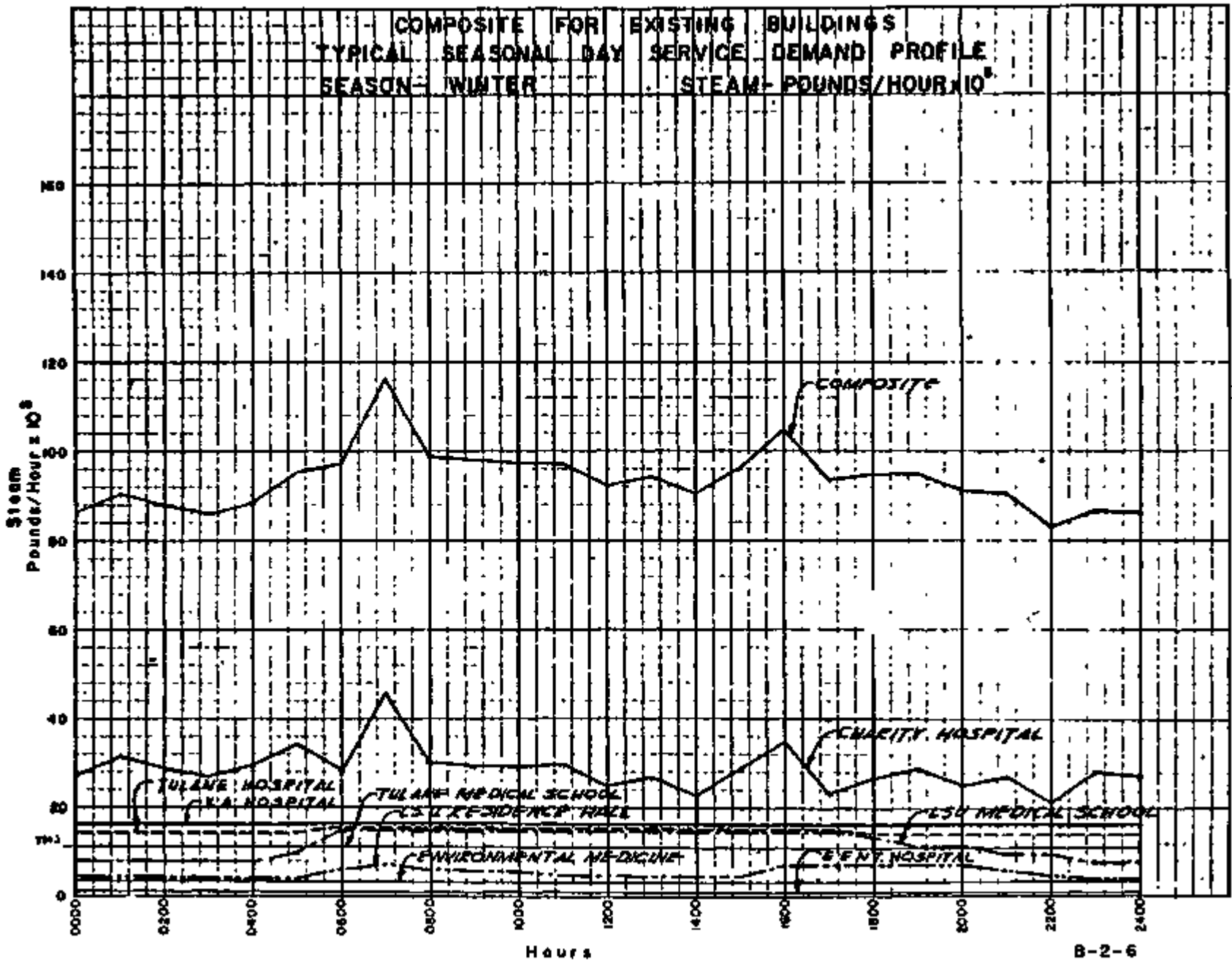


B-2-5



B-2-5

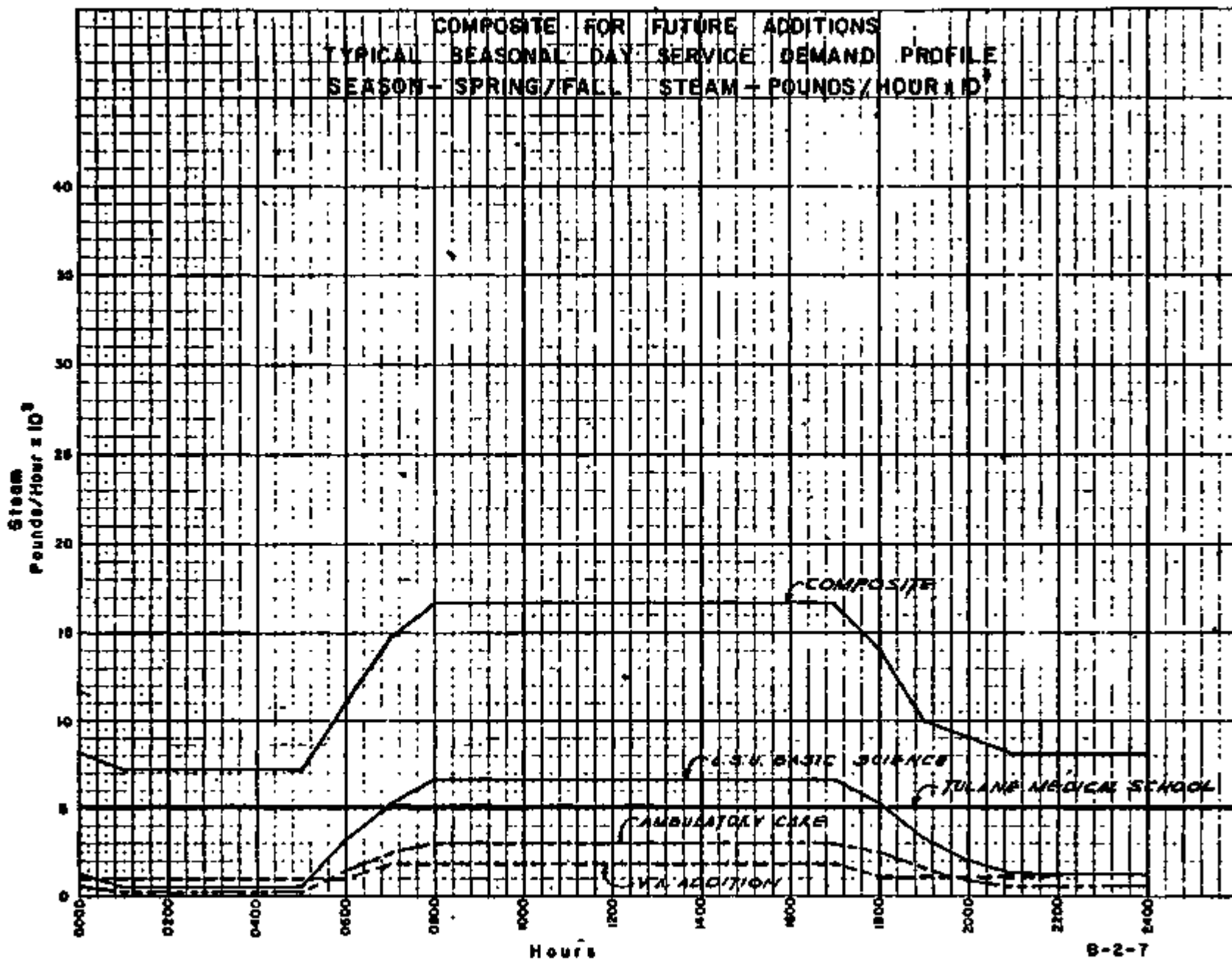
COMPOSITE FOR EXISTING BUILDINGS  
 TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
 SEASON: WINTER STEAM- POUNDS/HOUR  $\times 10^6$



B-2-6

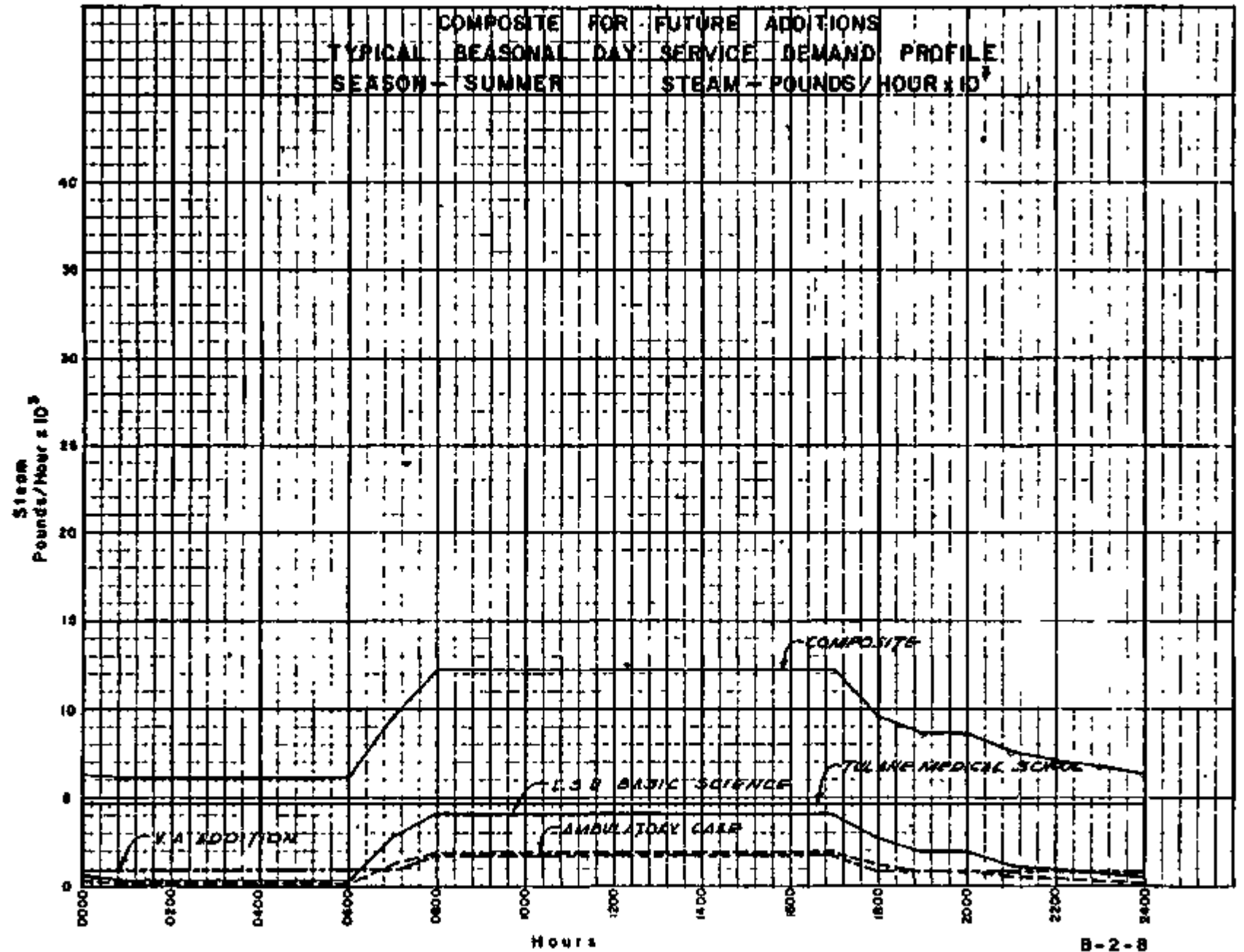
B-2-6

B-2-7

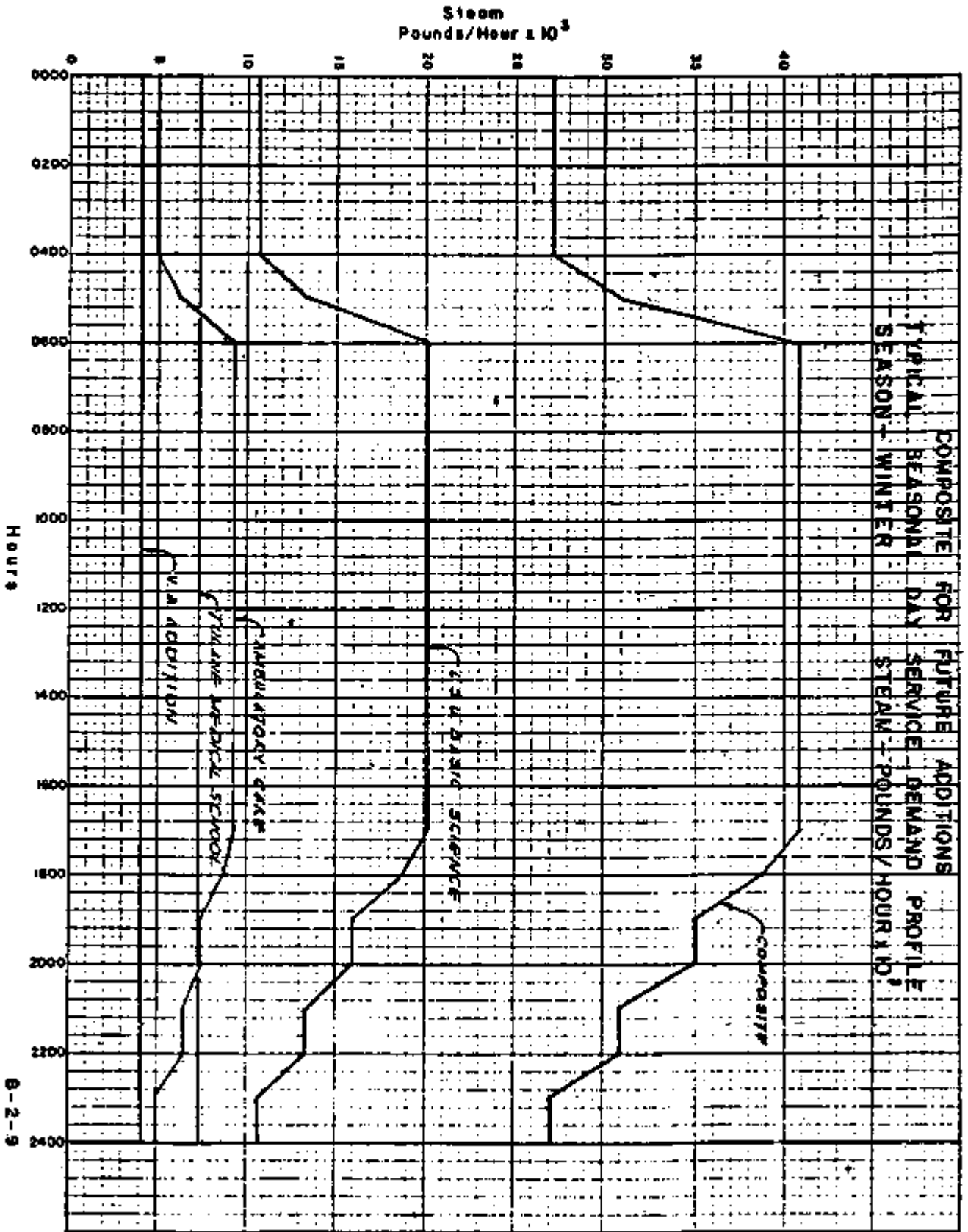


B-2-7

B-2-8

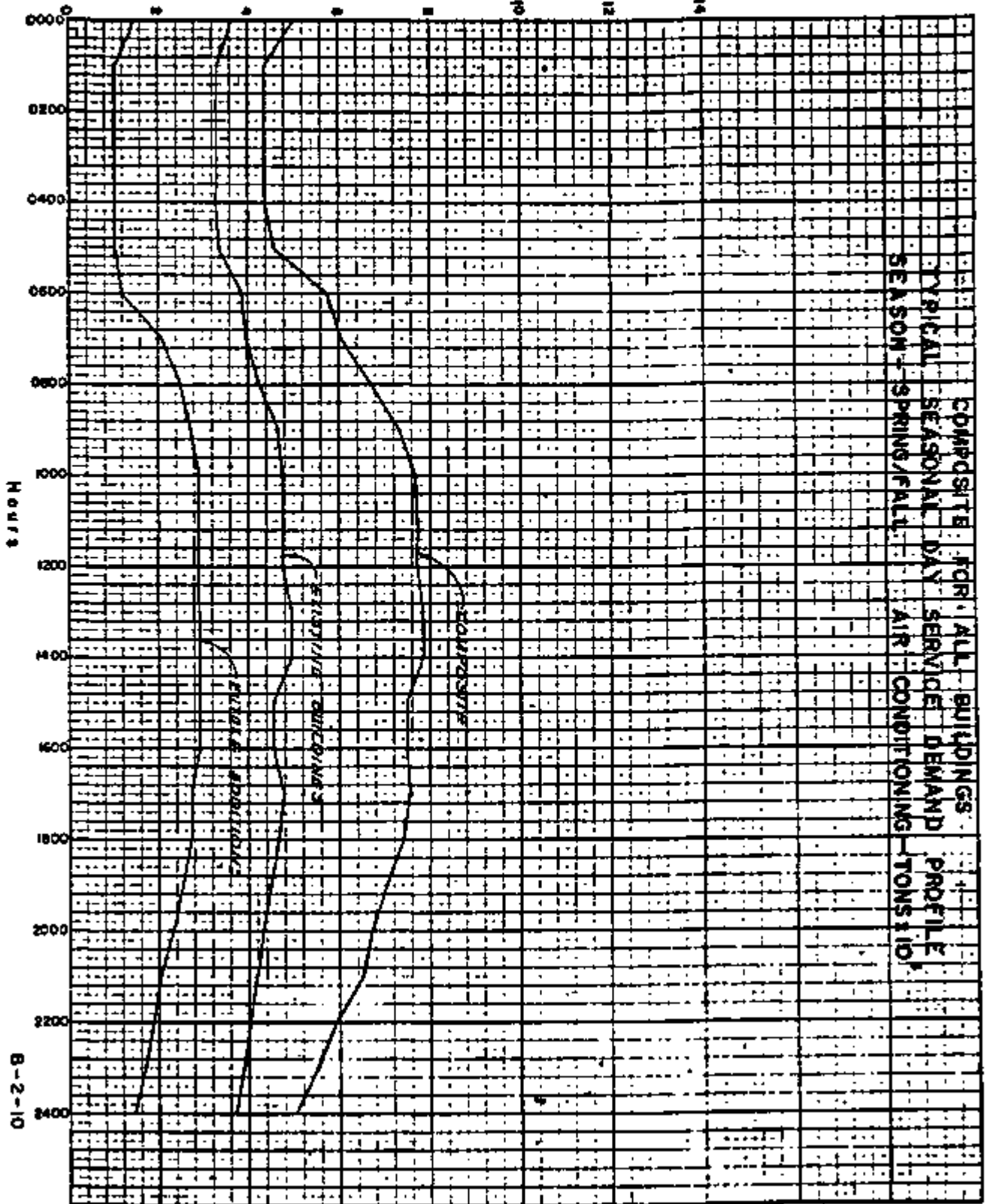


B-2-8



Air Conditioning

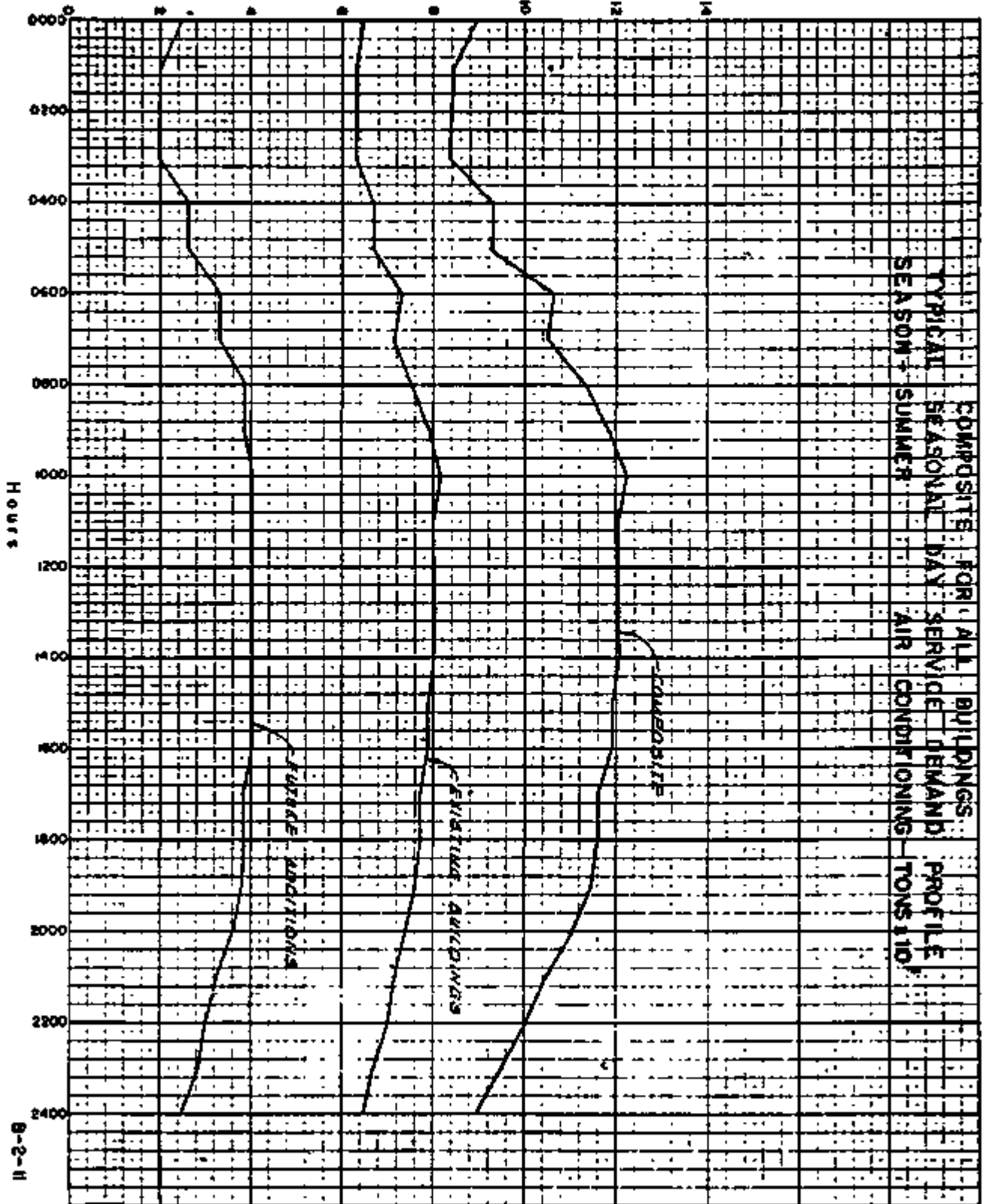
Tons x 10<sup>3</sup>



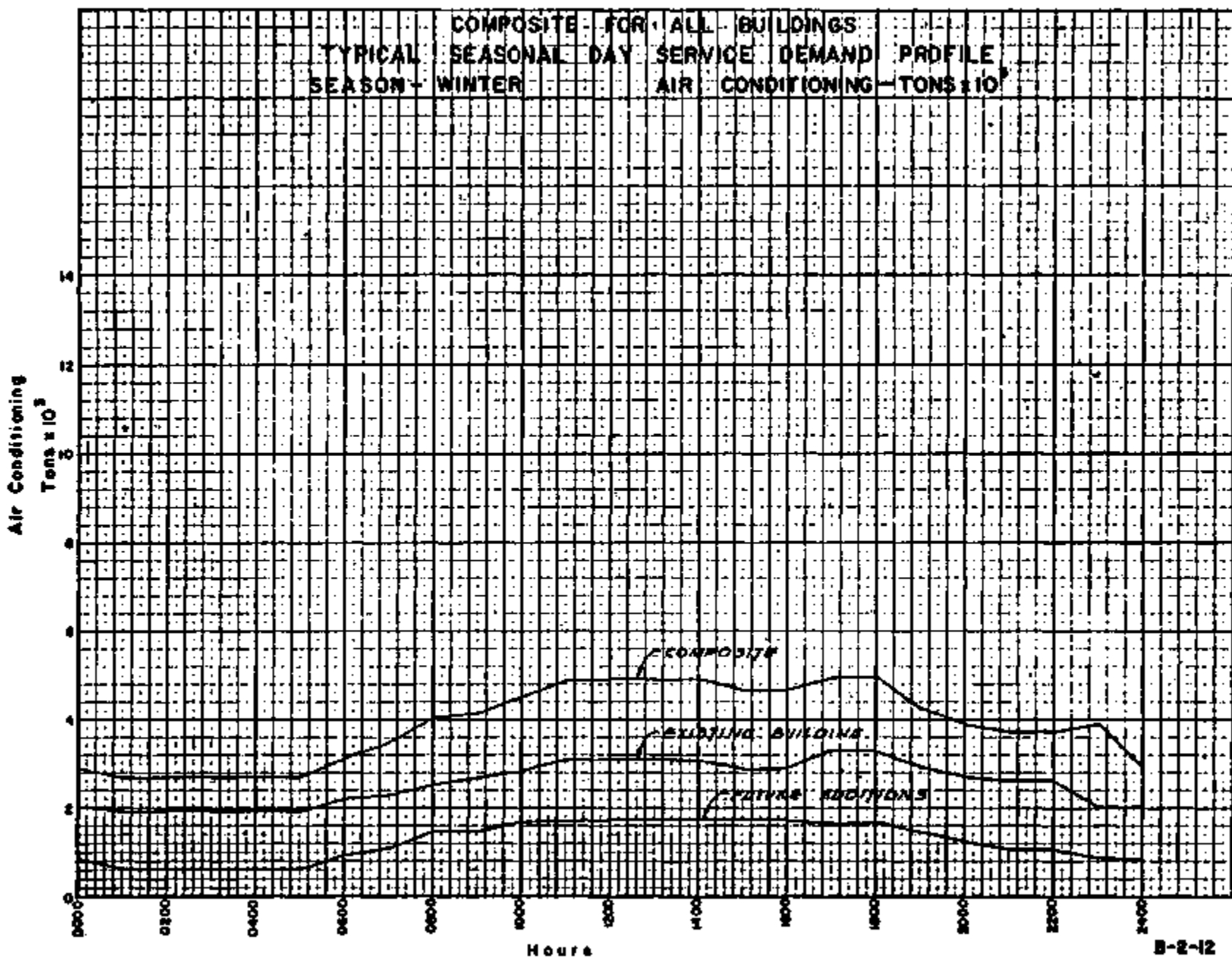
11-2-9

Air Conditioning

Tons  $\times 10^3$



B-2-12

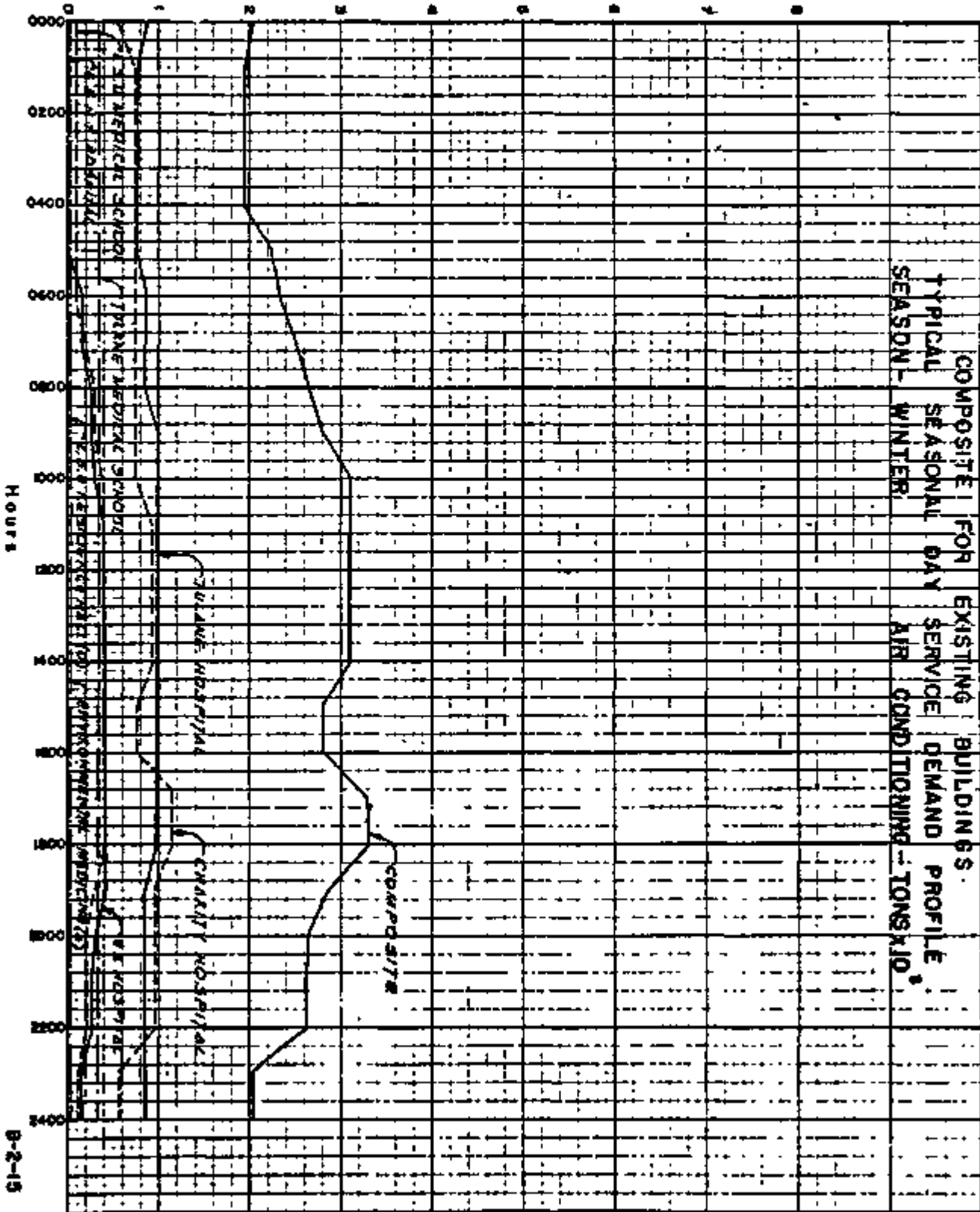


B-2-12



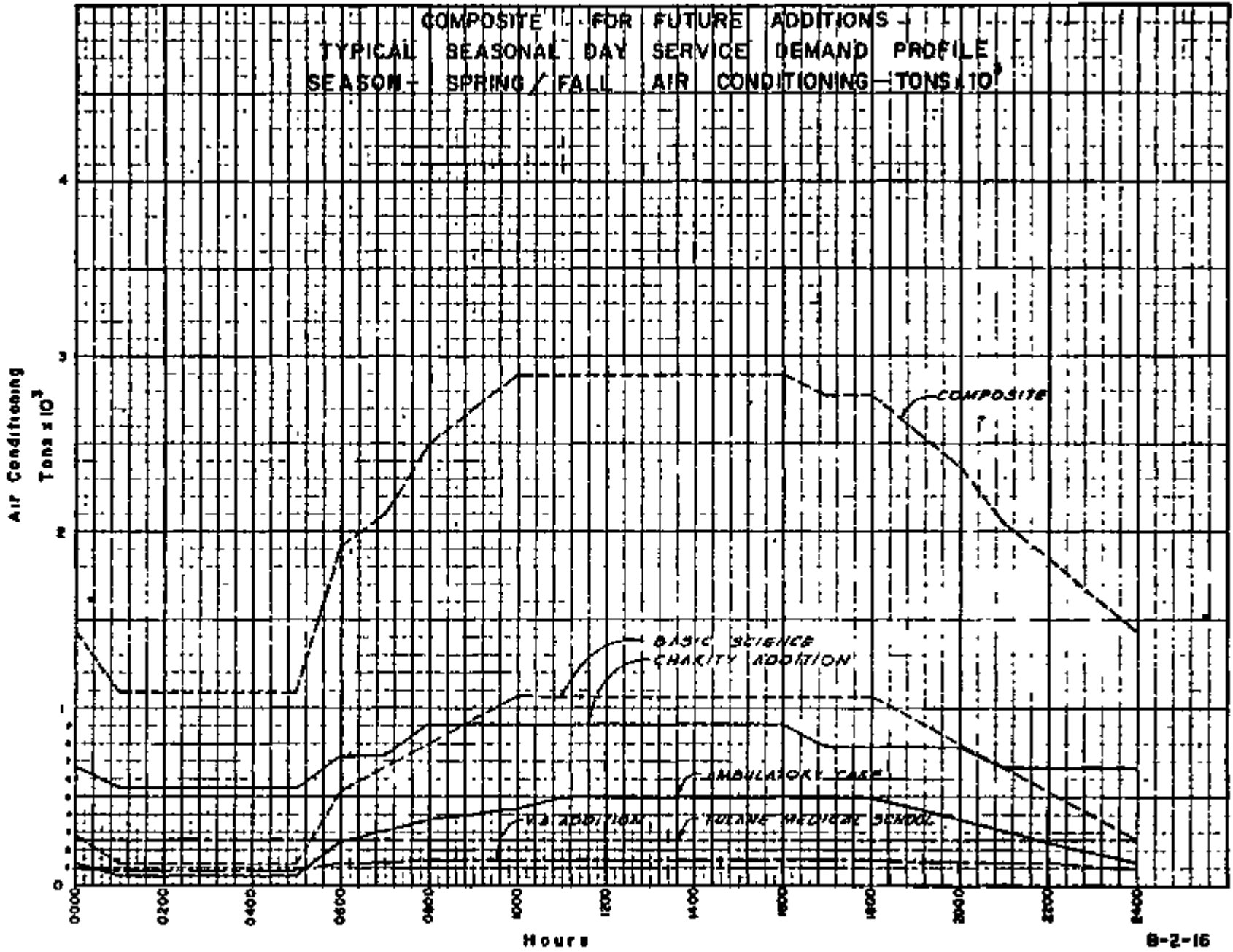


Air Conditioning  
Tons x 10<sup>3</sup>



COMPOSITE FOR EXISTING BUILDINGS  
TYPICAL SEASONAL DAY SERVICE DEMAND PROFILE  
SEASON - WINTER AIR CONDITIONING -- TONS x 10<sup>3</sup>

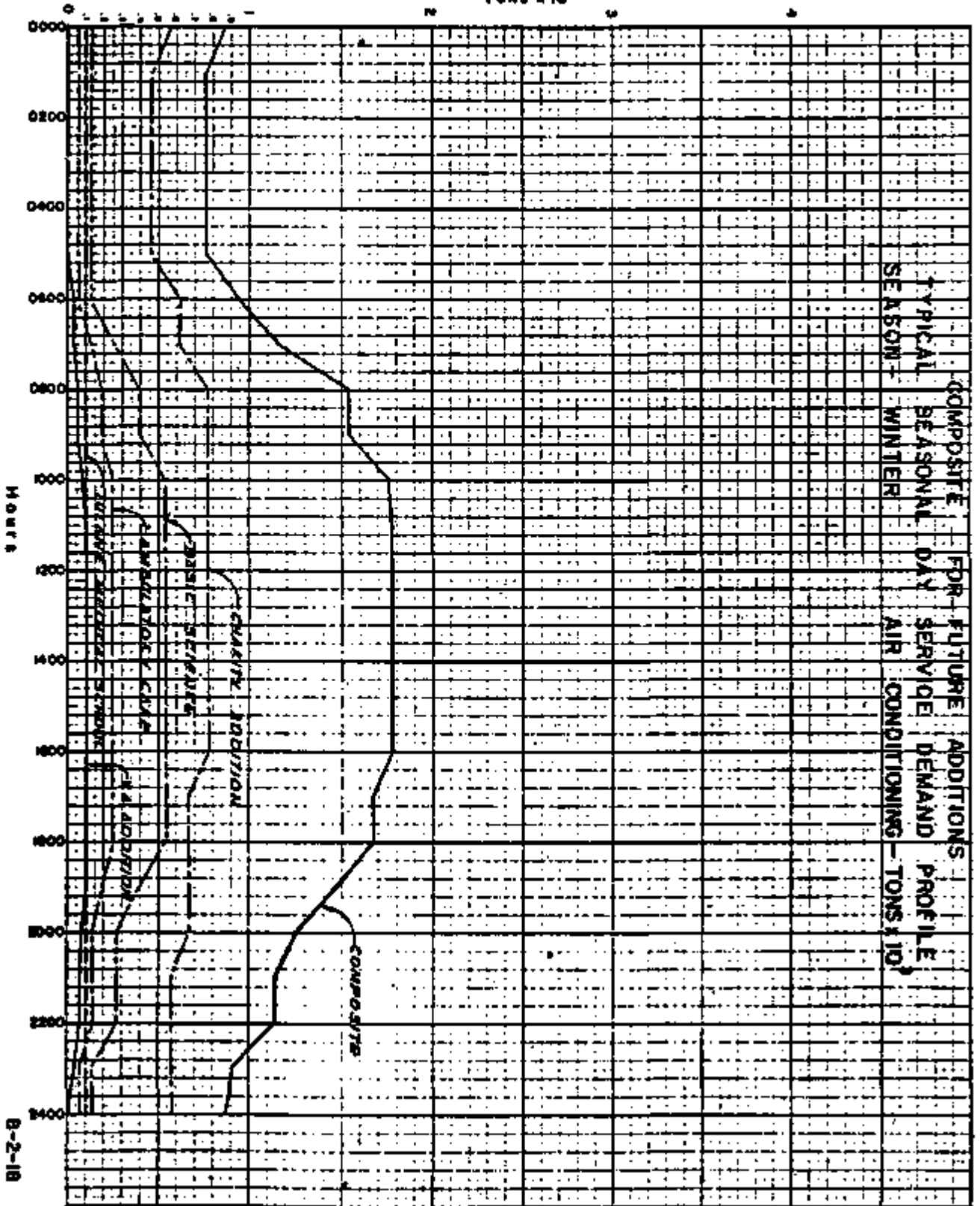
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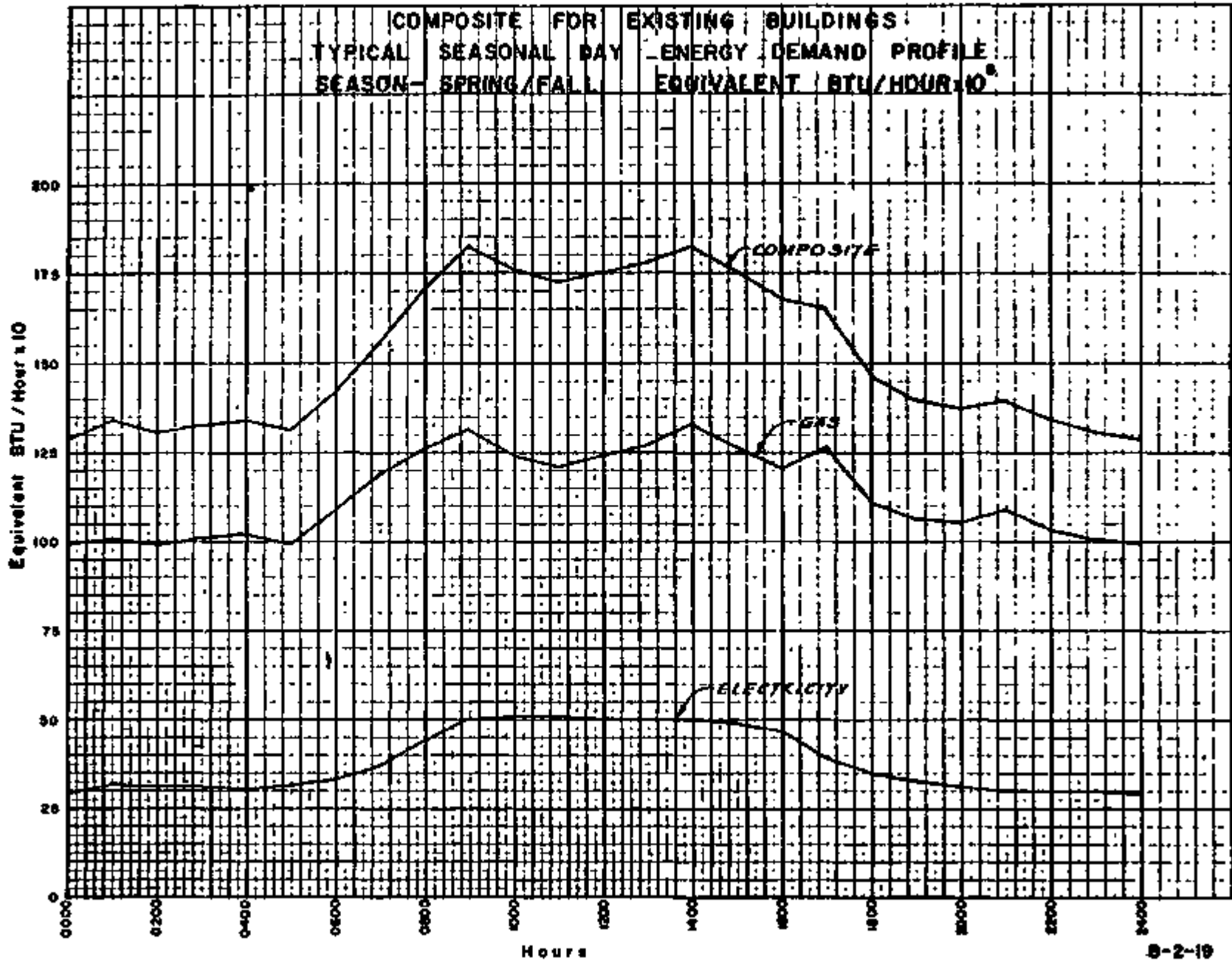
B-2-16



Air Conditioning  
Tons x 10<sup>3</sup>

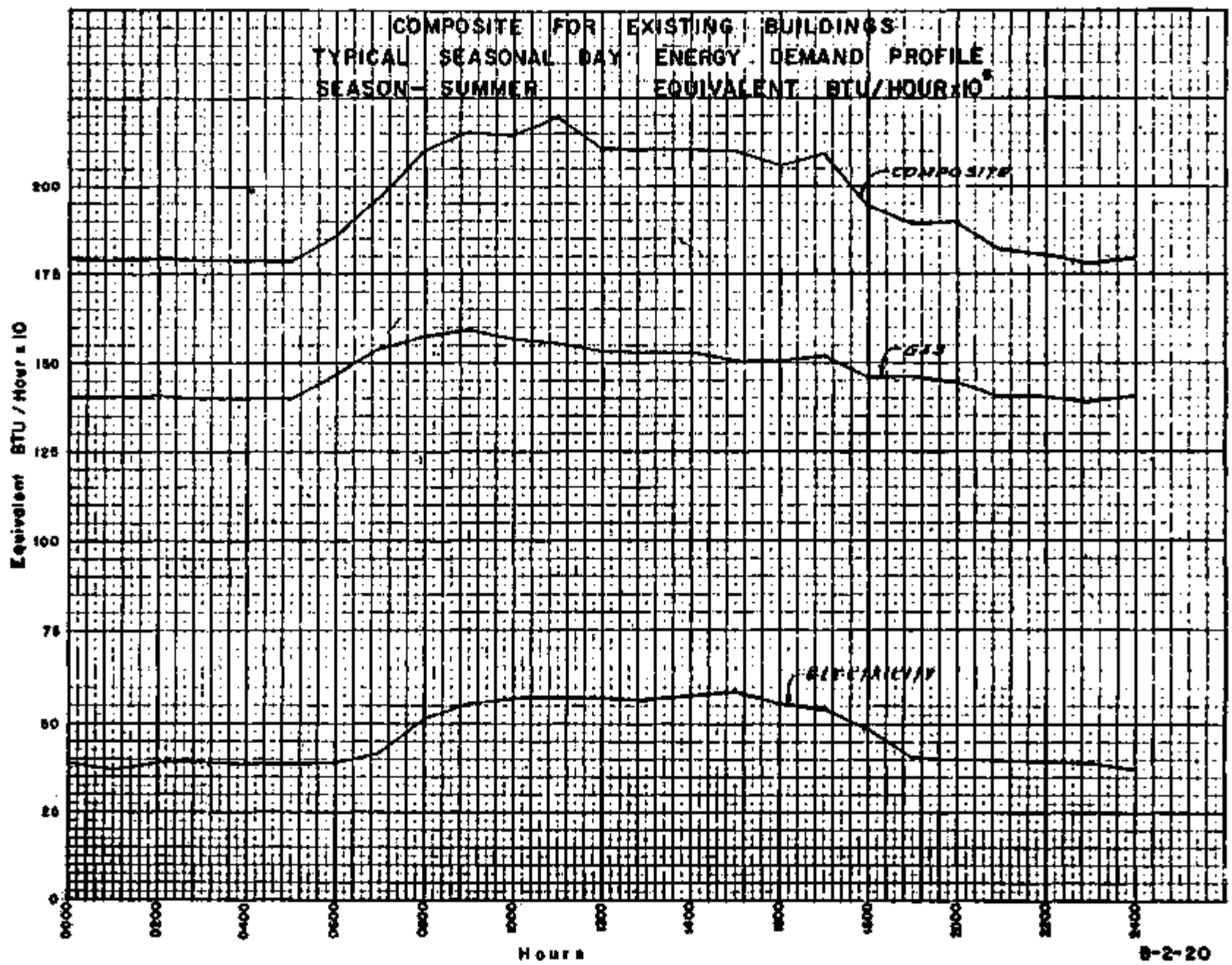


B-2-19



B-2-19

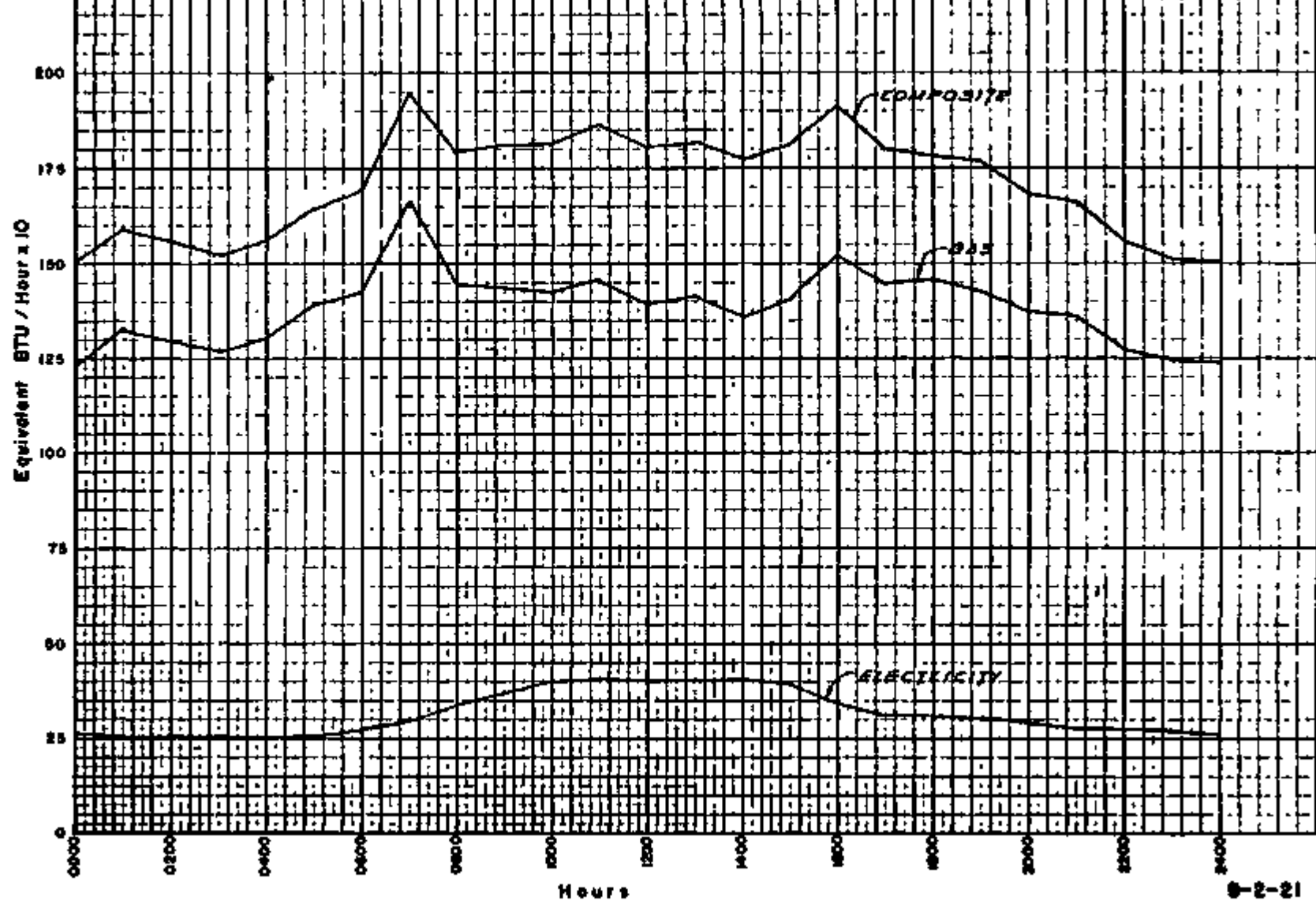
COMPOSITE FOR EXISTING BUILDINGS  
 TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE  
 SEASON - SUMMER EQUIVALENT BTU/HOUR x 10<sup>6</sup>



B-2-20

B-2-20

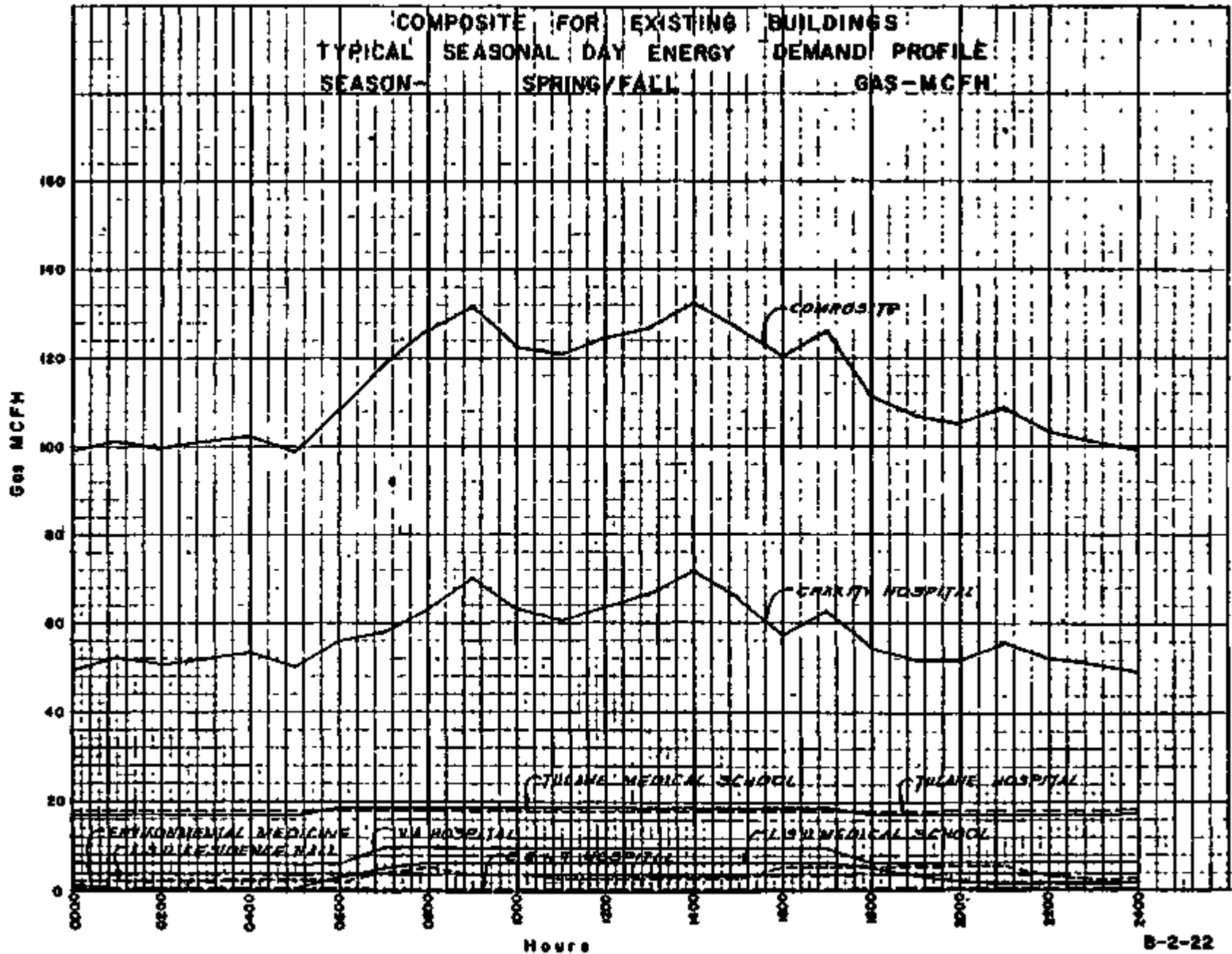
COMPOSITE FOR EXISTING BUILDINGS  
 TYPICAL SEASONAL DAY ENERGY DEMAND PROFILE  
 SEASON- WINTER EQUIVALENT BTU/HOUR x 10<sup>6</sup>



B-2-21

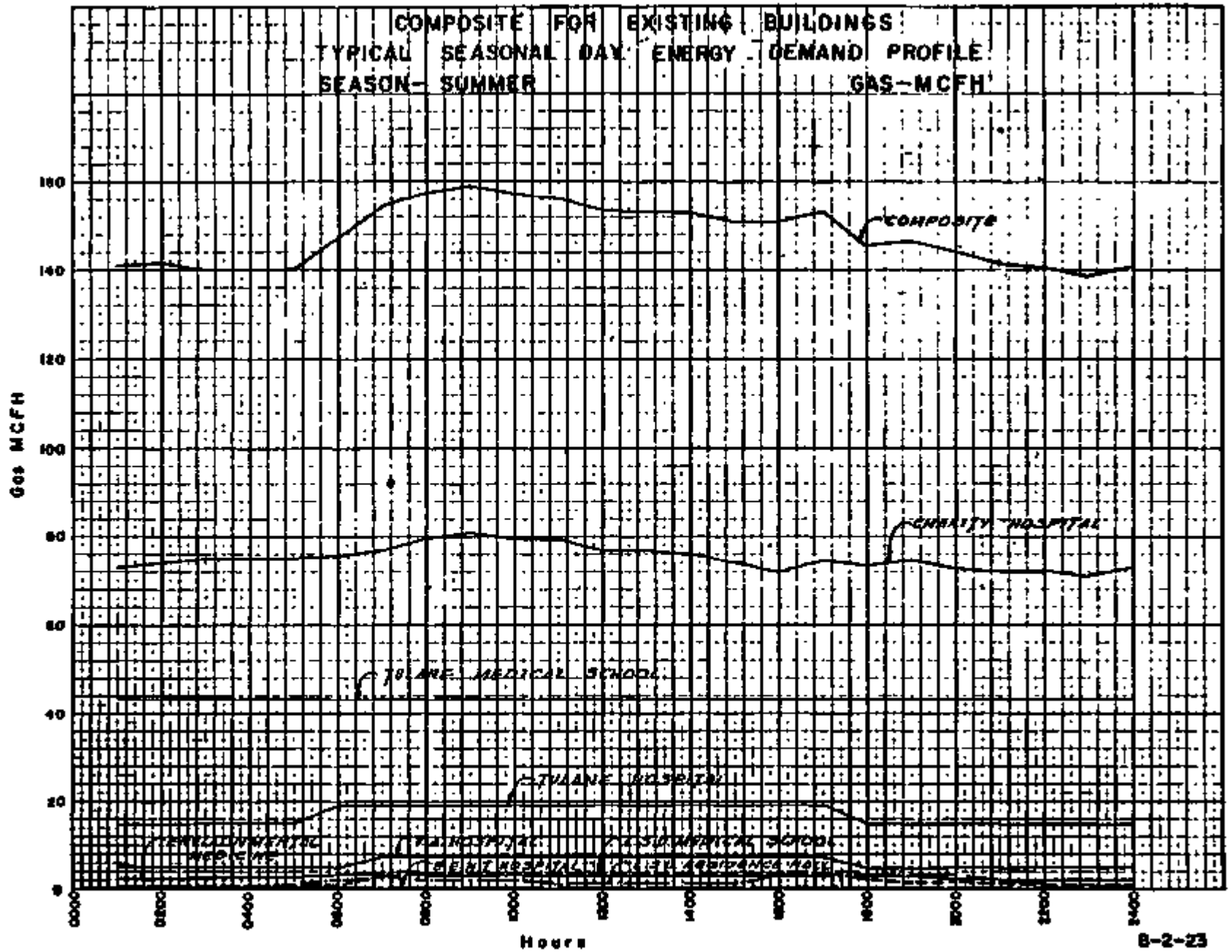
B-2-21

8-2-22



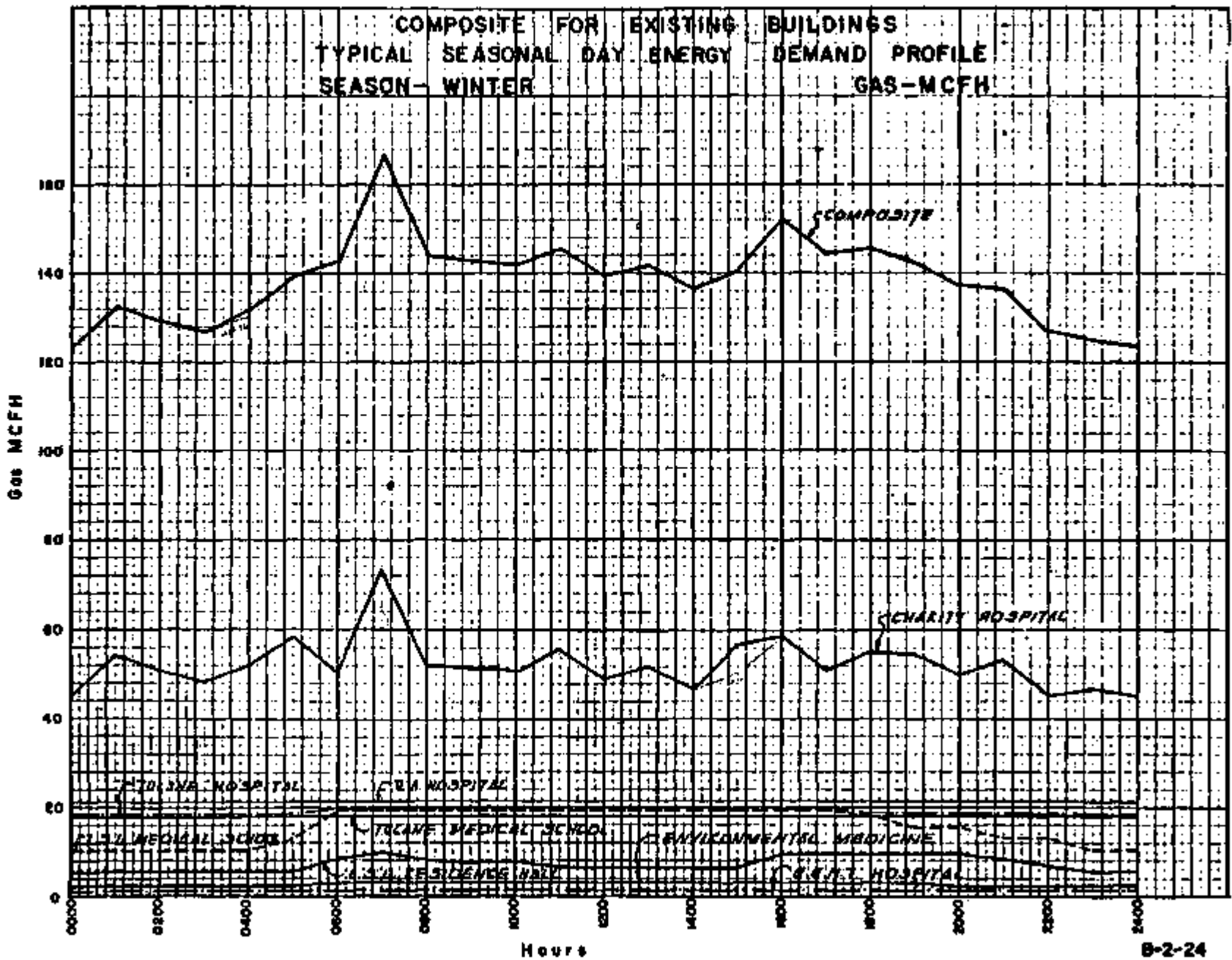
8-2-22

B-2-23



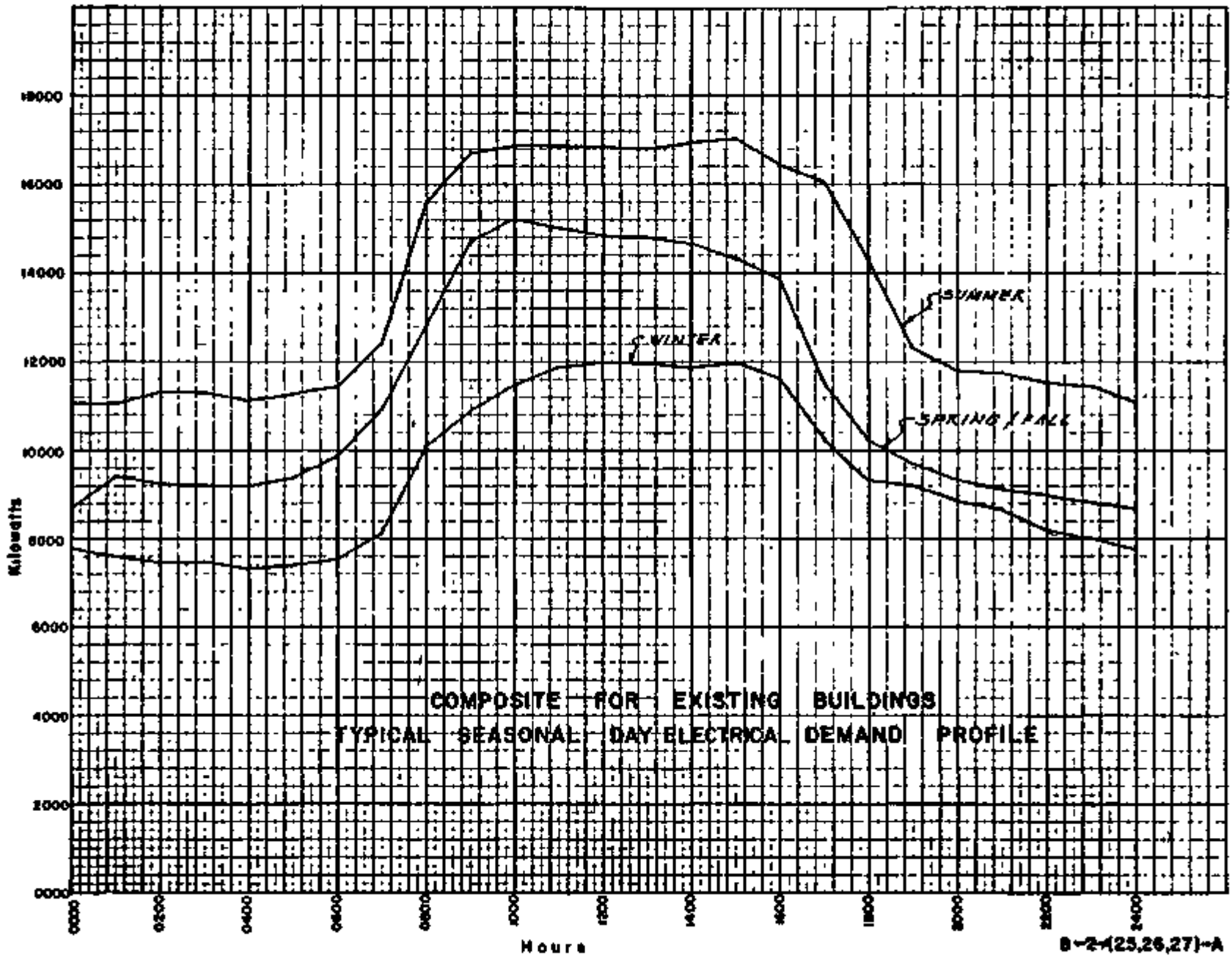
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B-2-24



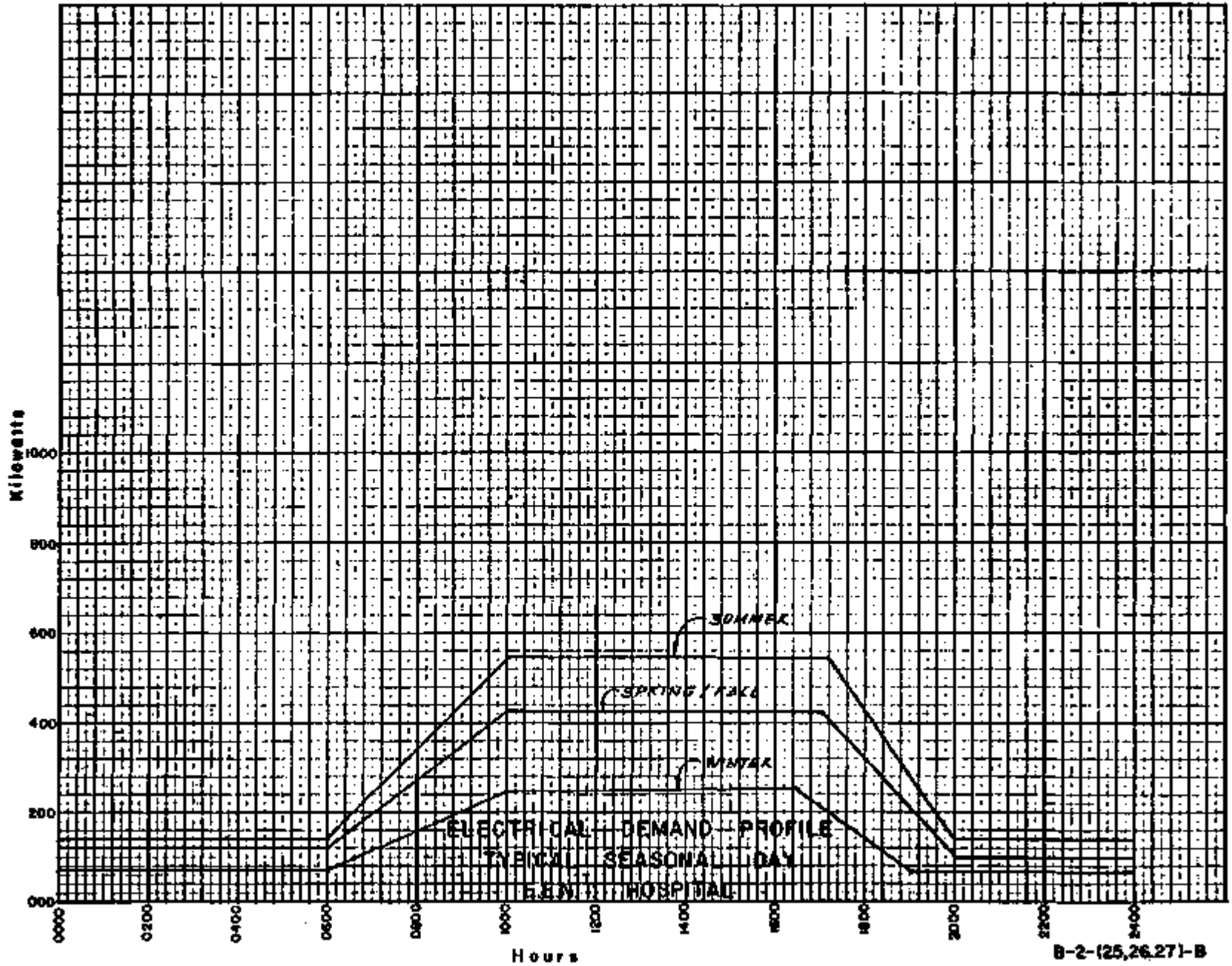
B-2-24

B-2-(25,26,27)-A



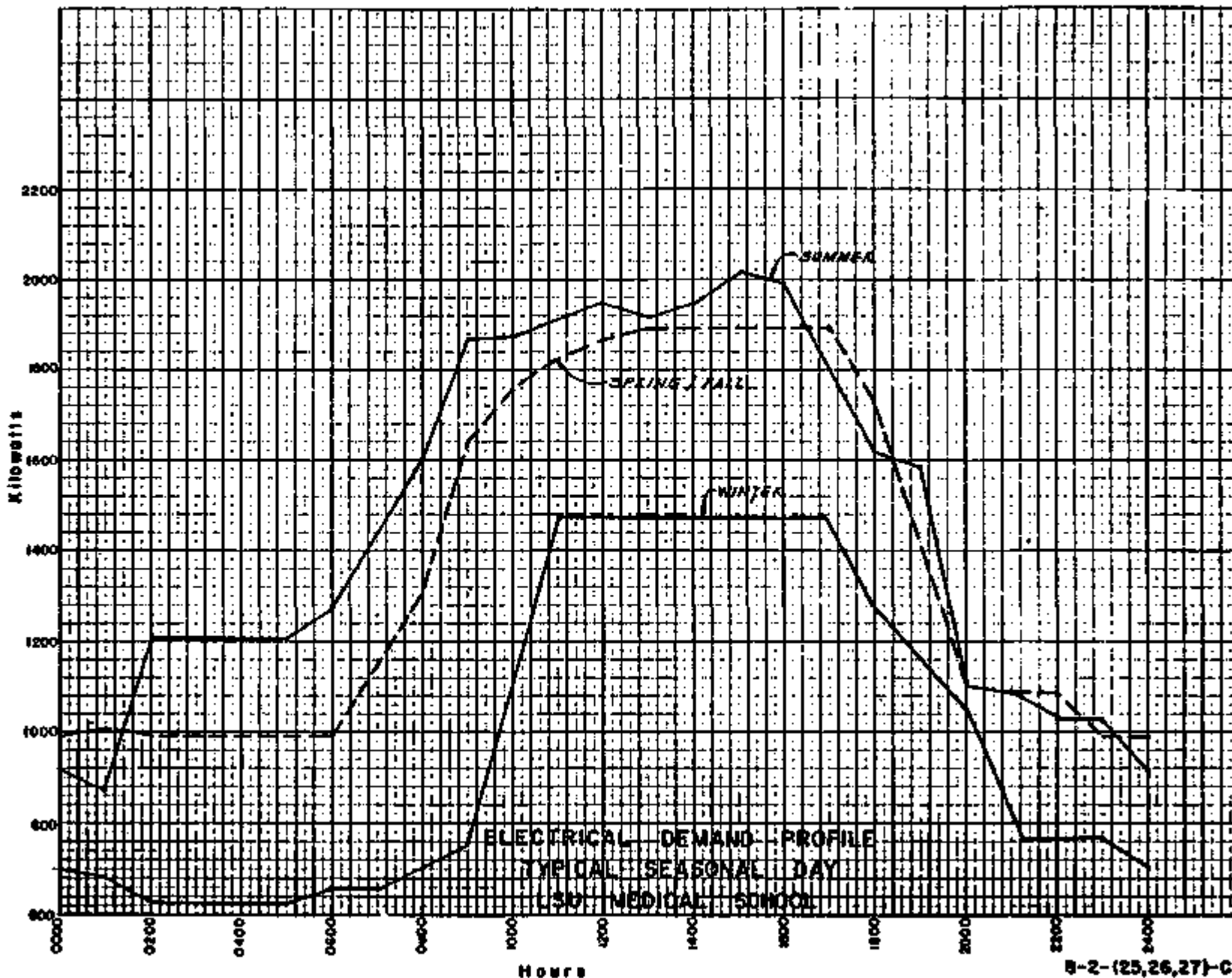
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B-2-(25,26,27)-B



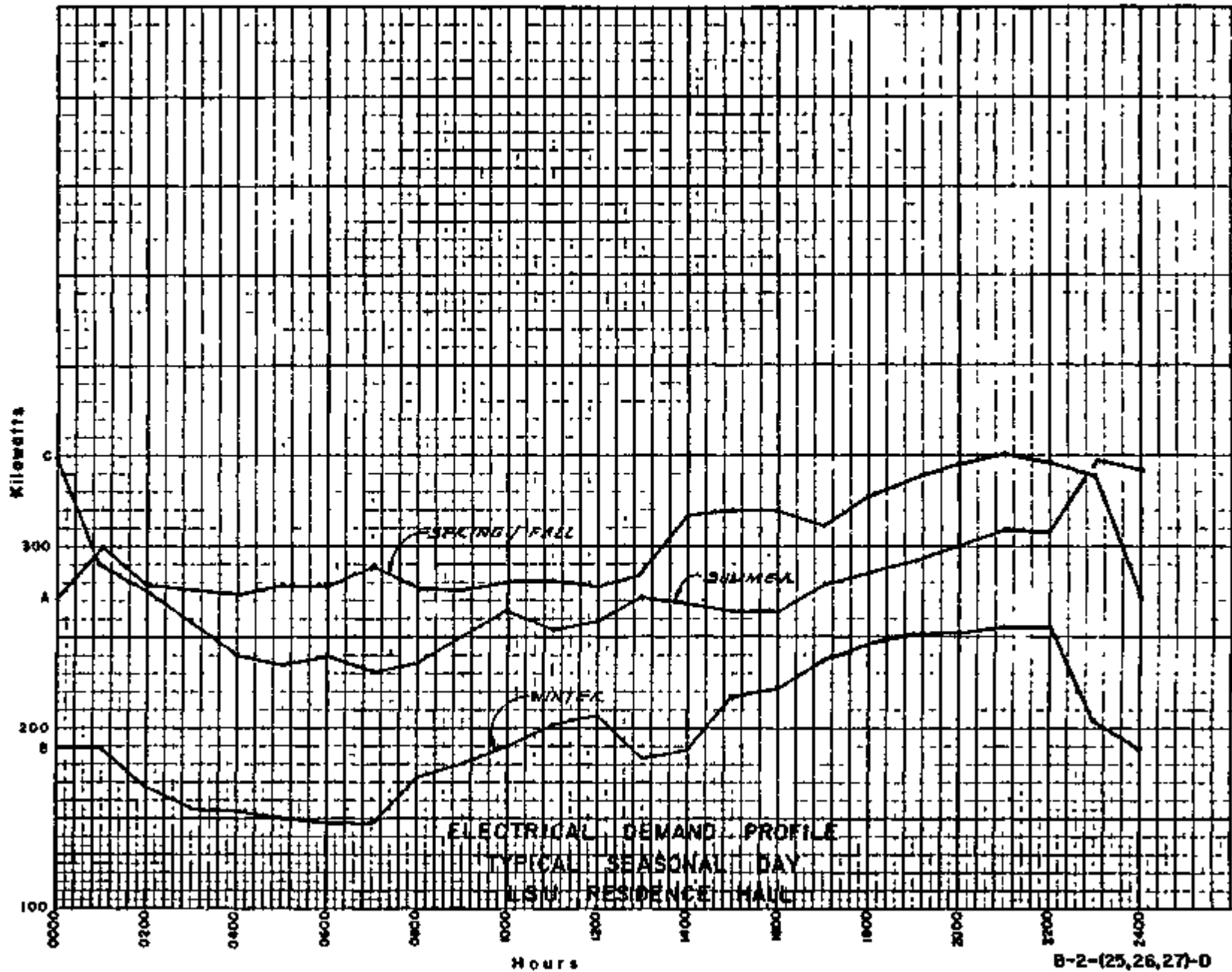
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B-2-(25,26,27)-C



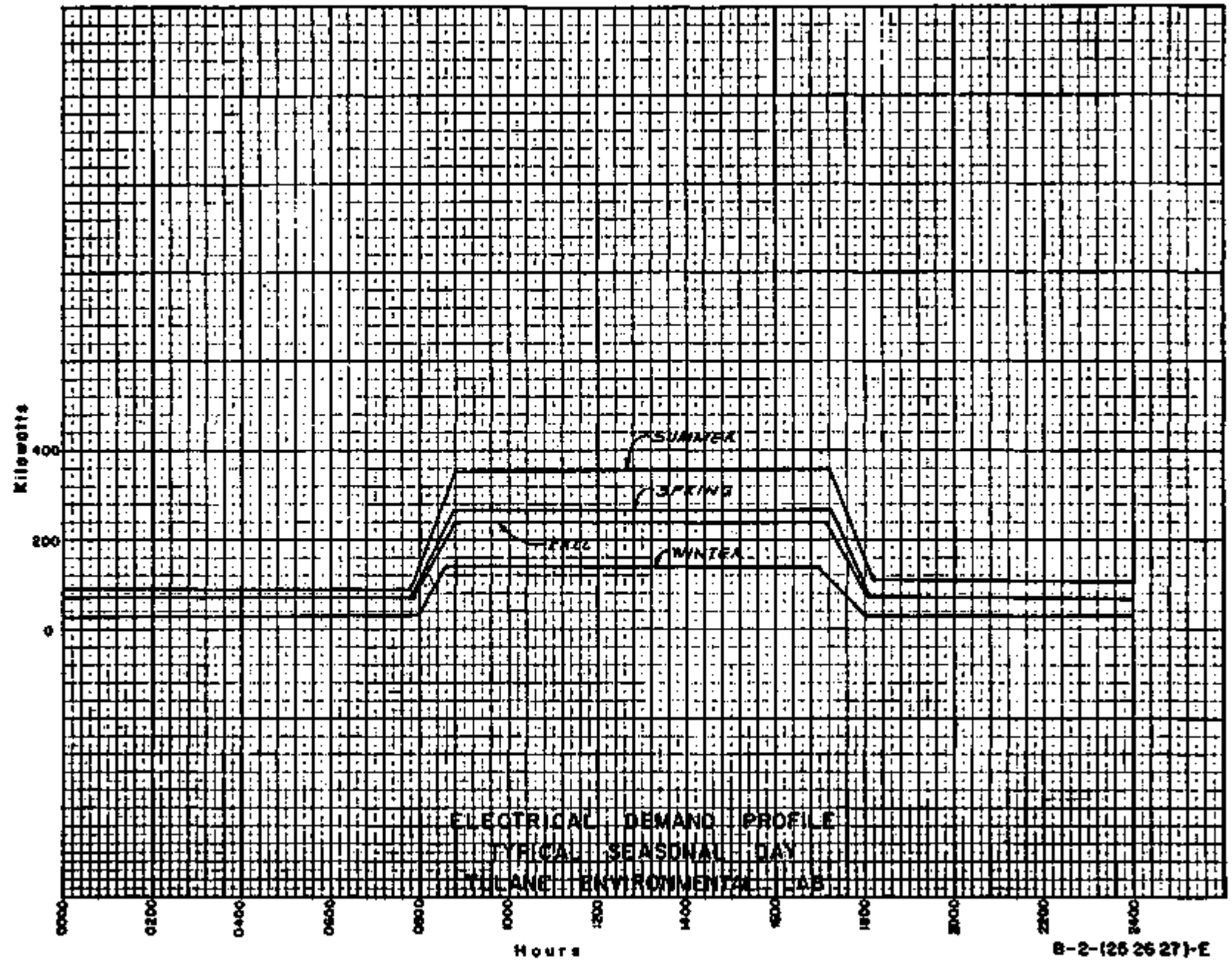
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B-2-(25,26,27)-0



B-2-(25,26,27)-0

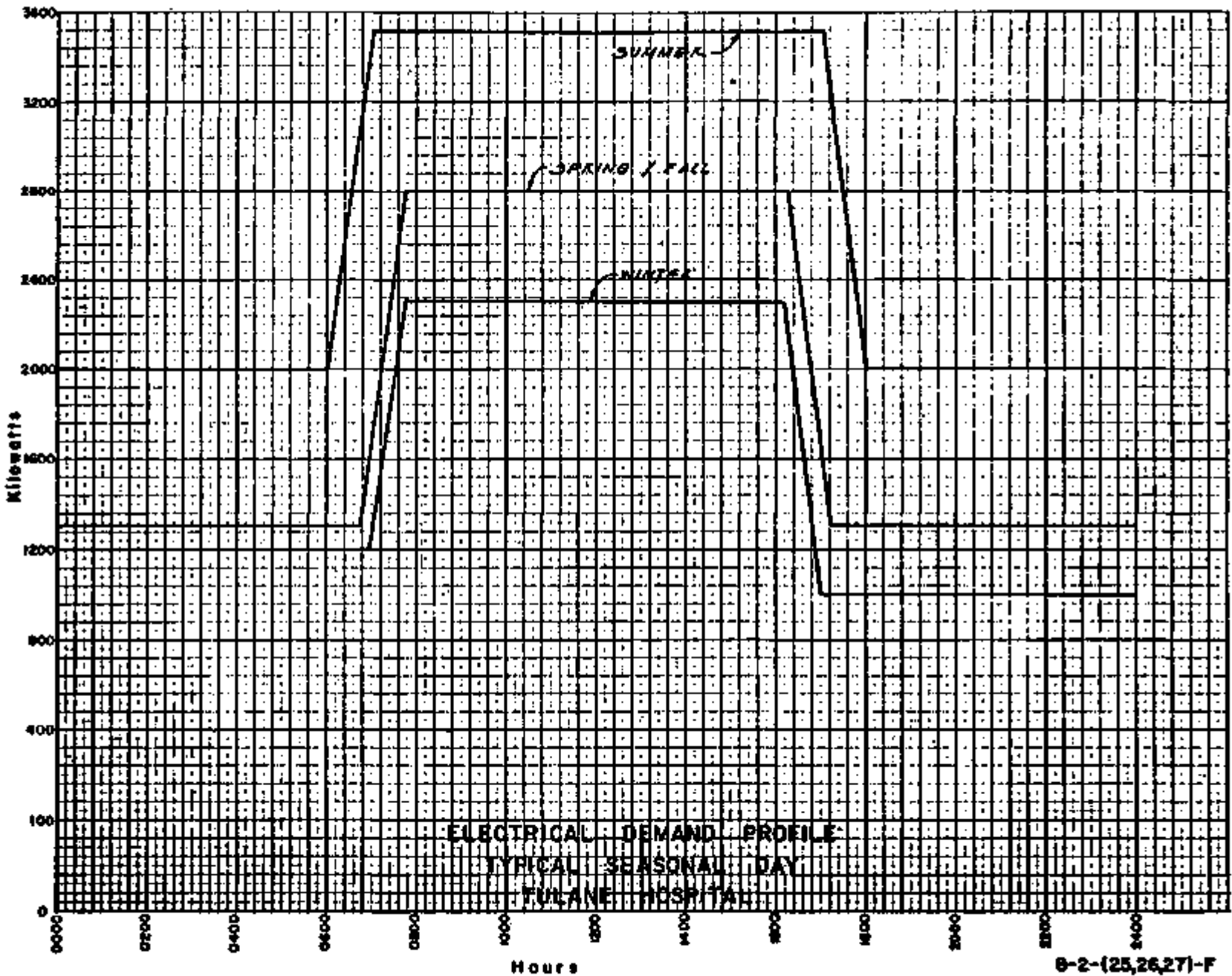
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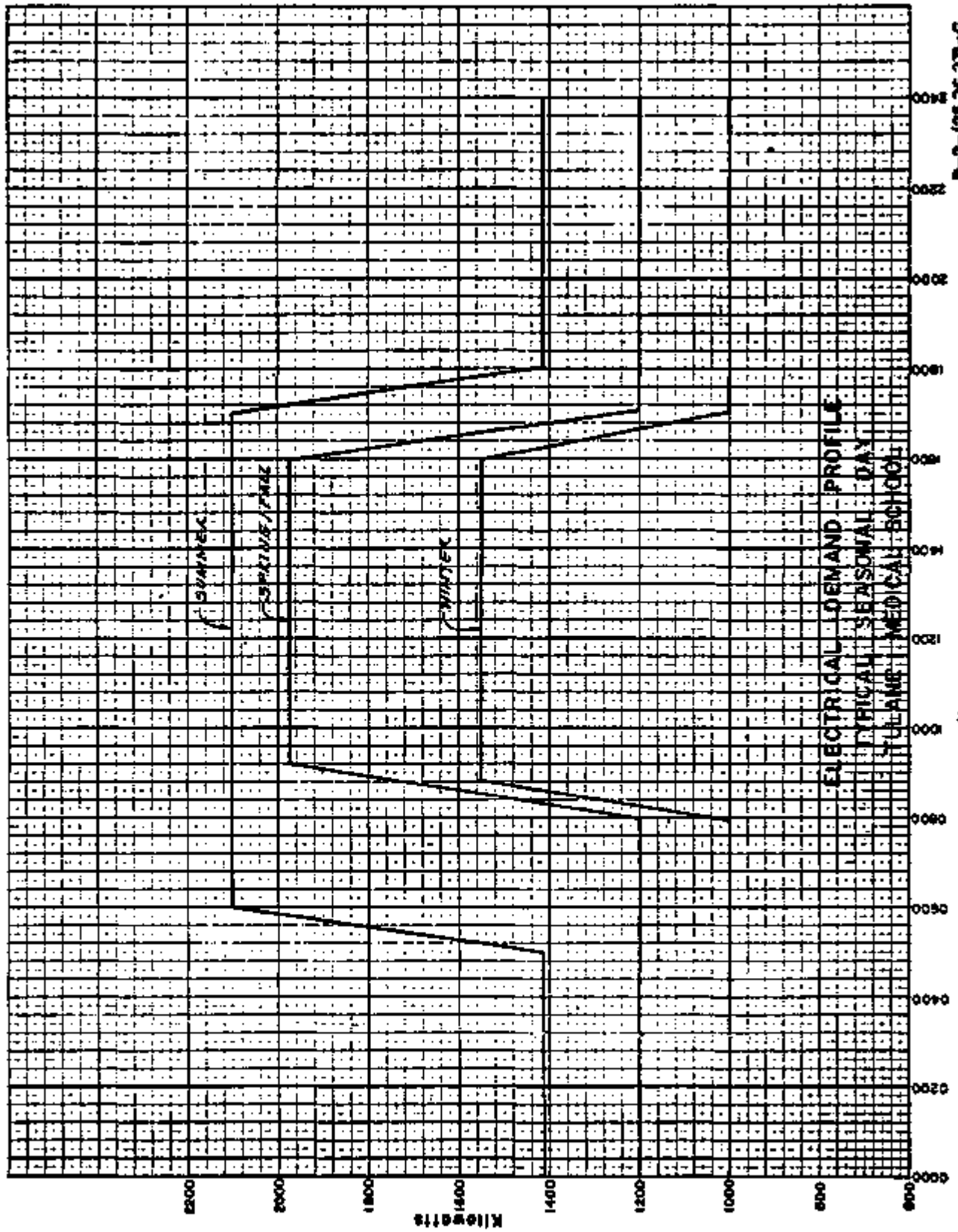
ELECTRICAL DEMAND PROFILE  
TYPICAL SEASONAL DAY  
TULANE ENVIRONMENTAL LAB

B-2-(25 26 27)-E

B-2-(25,26,27)-F



B-2-(25,26,27)-F

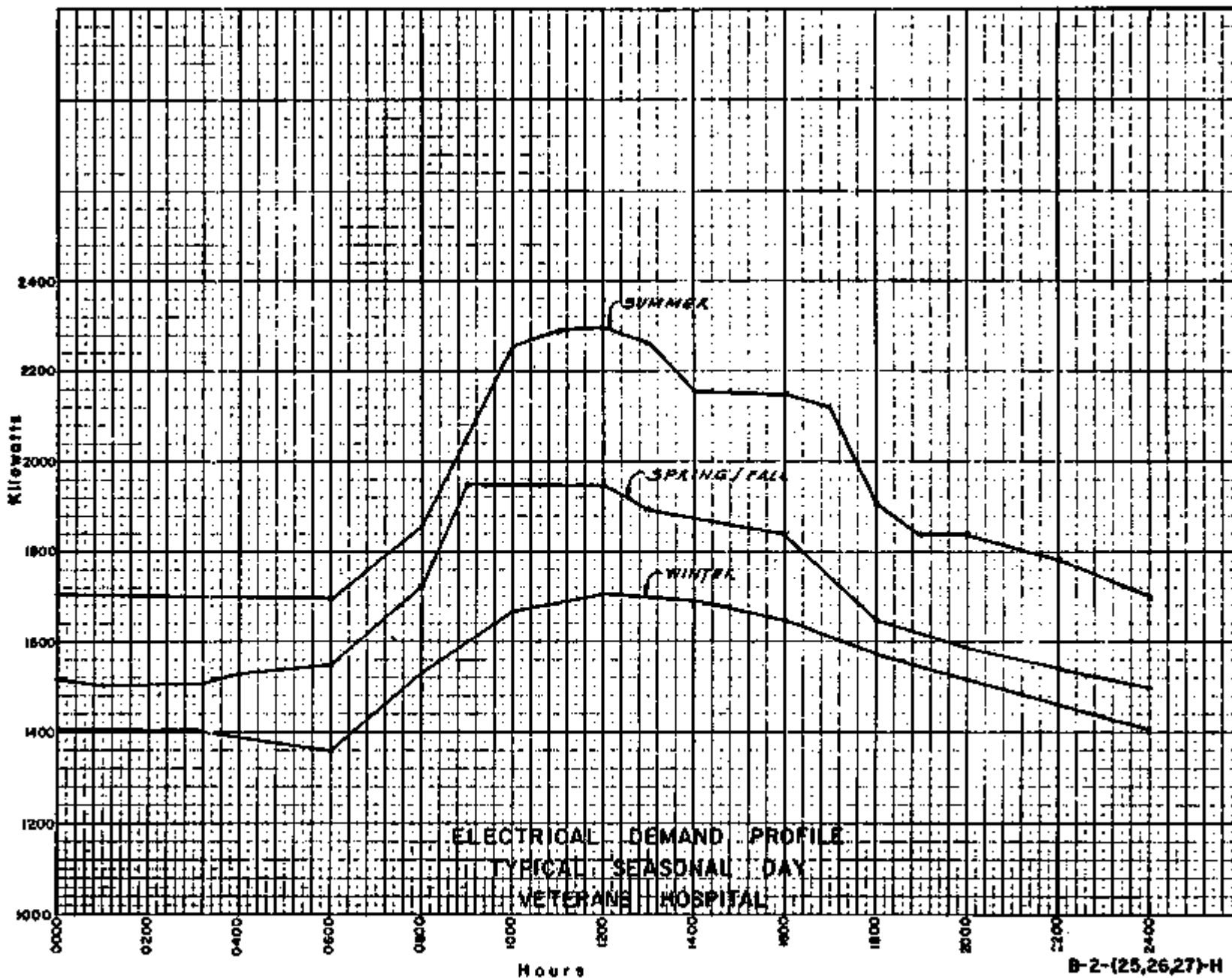


B-2-(25,26,27)-G

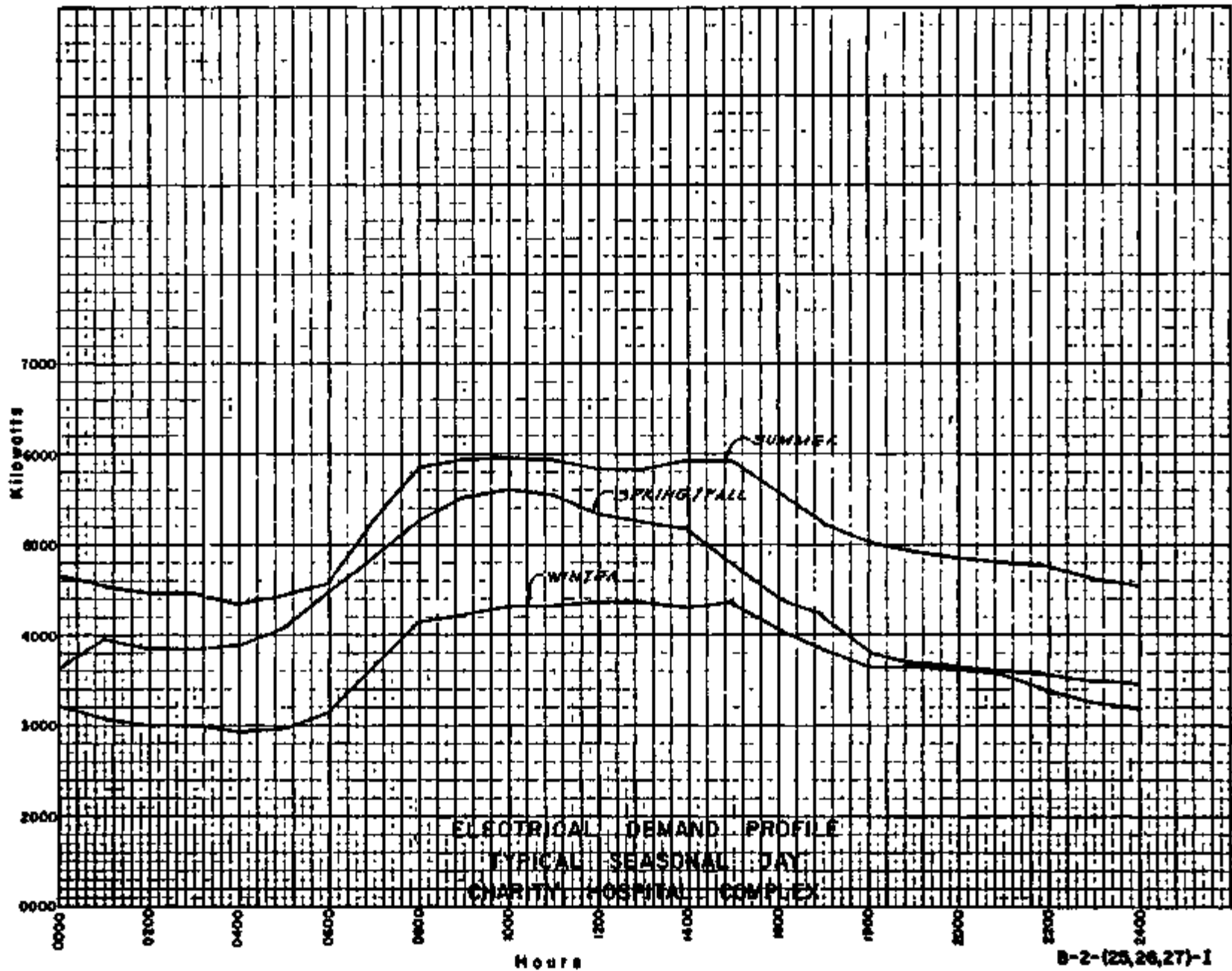
B-2-(25,26,27)-G

ELECTRICAL DEMAND PROFILE  
 TYPICAL SEASONAL DAY  
 ULAMB MEDICAL SCHOOL

B-2-(25,26,27)-H

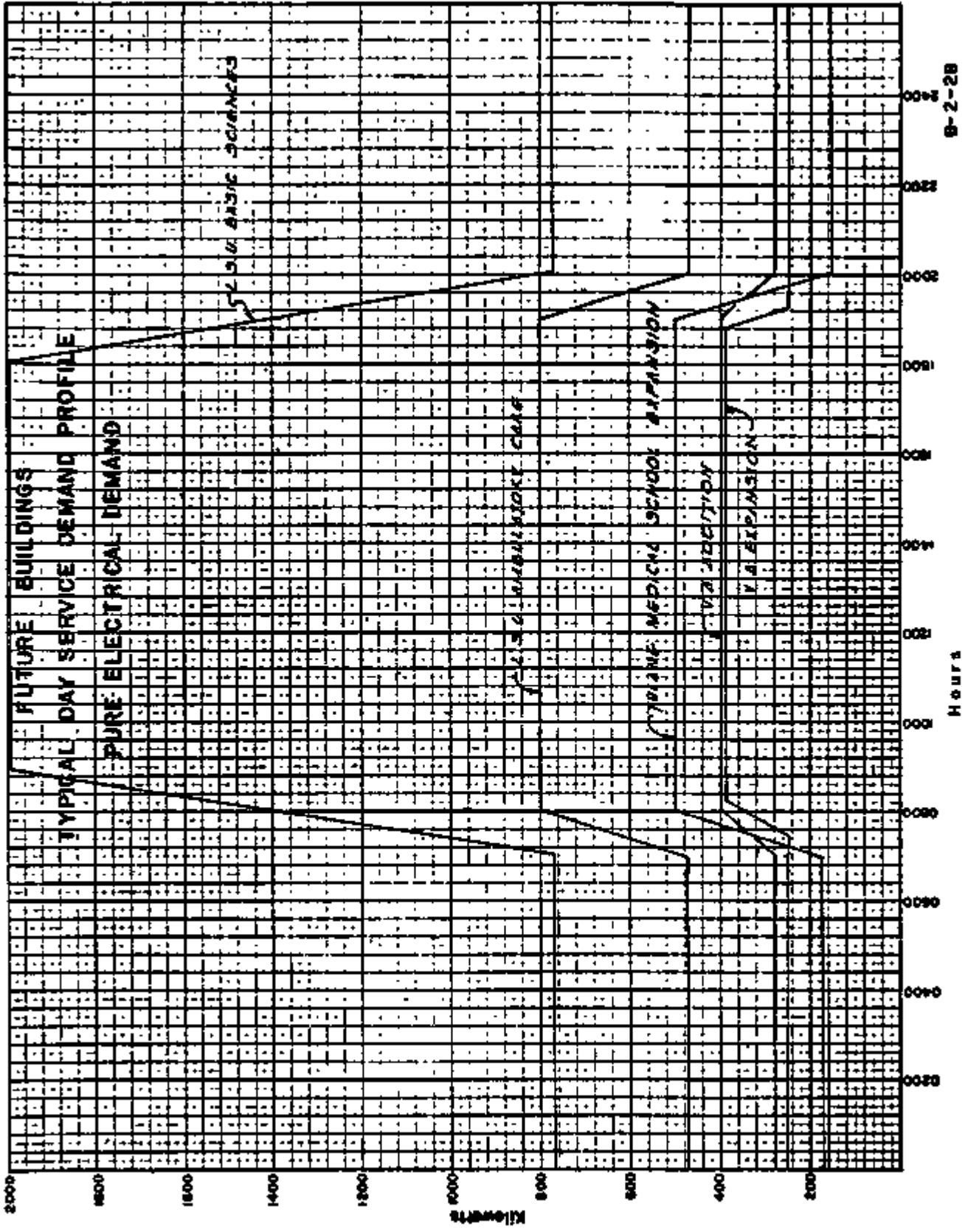


B-2-(25,26,27)-1



ELECTRICAL DEMAND PROFILE  
TYPICAL SEASONAL DAY  
CHARITY HOSPITAL COMPLEX

B-2-(25,26,27)-1



APPENDIX C  
ENVIRONMENTAL ASSESSMENT  
AIR QUALITY & NOISE  
C-1-1 THRU C-1-57

## EXISTING SOUND AND AIR QUALITY LEVELS FOR THE HEAL COMPLEX

### Summary

All levels of responsible governmental agencies were consulted in order to obtain current guidelines and levels of noise and air quality in New Orleans Central Business District. In addition, consultants and institutions were consulted to obtain the latest information pertaining to existing conditions in New Orleans. From these inquiries, the following data were obtained. Data for noise and carbon monoxide levels in the city were obtained from The Environmental Impact Statement for The Proposed Greater N.O. Mississippi River Bridge. Contours of concentrations were plotted and are presented for both noise and CO. The current federal guidelines from both EPA and OSHA are presented. Data for existing levels of air pollution in the project area and state guidelines were obtained from the State Air Quality Commission. Also included are Federal Emission and Guidelines factors for coal and fuel oil combustion.

In short, all data available to assess the current conditions of noise and air quality have been included in order that the requirement of ERDA may be met in regards to the environmental assessment for existing conditions to this project.

### Conclusions and Recommendations

From a comparison of existing data on noise and air quality in New Orleans to State and Federal Guidelines, it may be concluded:

1. The noise levels in the HEAL Complex are tolerable as far as potential harm to hearing is concerned.
2. The noise levels are intolerable as far as interference to activity in a hospital zone is concerned based on the data obtained and locations measured with respect to the complex. However since areas within the heart of the complex were not measured, the data may need supporting measurements as it is suspected that the hospital zone may be quieter than indicated.
3. The air quality, with the exception of oxidants, is not at intolerable conditions in the HEAL area.
4. Since emission standards for stationary sources for combustion of coal and fuel oil do not provide for oxidants, the existing oxidant violations will have no effect on the project.

### Recommendations

1. A survey of the noise measurements in the HEAL area will have to be made in order to provide more substantial facts about the Demonstration Community.

### Existing Sound Levels and Air Quality

#### Sound Levels

There are three dimensions which are important in determining man's response to sound; the level of intensity of the sound, the frequency spectrum of the sound, and the time varying character of sound. The magnitude of air pressure fluctuations produced by sound is referred to as the sound level and is measured in decibels (dB). Examination of Table I along with the following five relationships will help in the understanding of decibel values used in this report.

Zero dB corresponds roughly to the threshold of sensitivity of human hearing.

Except in carefully controlled laboratory experiments, a sound level increase of only one dB cannot be perceived.

Outside of the laboratory, a sound level increase of three dB is considered a just-noticeable difference.

A change in sound level of at least five dB is required before any noticeable change in community response would be expected.

A ten dB increase in sound level is subjectively heard as approximately a doubling in loudness.

The frequency of a sound is the number of complete pressure fluctuations per second and its unit of measure is cycles per second or Hertz (Hz). Most of the sounds we hear do not consist of a single frequency, but are made up of a broad band of frequencies differing in relative level. The sound spectrum is the quantitative expression of the frequency and level content of a sound.

The urban environmental sound level is continuously in a state of change. This sound level includes two different types of sound. These two types of sound differ with respect to time of duration, frequency, intensity or loudness and regularity of repetition.

One component of the total sound level is the background or ambient sound level. This background sound level consists of sound sources which can be considered as permanent sound sources, both stationary and mobile, of an urban environment. Some examples of sound sources which make up the background sound level are distant traffic sounds, wind and industrial activities. When these sound sources are combined to form

the background sound level, they become unidentifiable as separate, distinct sounds which in turn produces the hum of an urban environment. Characteristic of background sound levels are combined sounds which tend to be relatively constant over a short period of time, the frequencies of which, when taken as a whole, lie in the low frequency ranges and the repetition of such sounds tend to be regular. While the background sound level is fairly constant over a short period of time, it varies as natural forces and human activity change throughout the day.

Added to this ambient or background sound level, and differing from it, are sounds which are intermittent in nature, last for a brief duration, are generally higher in pitch or frequency and louder or more intense than the background sound level. Examples of these disturbing sound sources are busy roadways, low flying aircraft, trains and emergency vehicle sirens. These sounds create instantaneous peaks in the environmental sound level.

The accepted way to evaluate the time varying characteristics of environmental sound is by statistics. Statistically, the background sound level is defined as the sound level exceeded 90 percent of the time during any specific time period. Sounds produced by trucks, trains, planes or industrial processes cause the sound level to reach higher peak values.

TABLE I

WEIGHTED SOUND LEVELS AND HUMAN RESPONSE

<u>SOUND SOURCE</u>	<u>dB(A)</u>	<u>TREND OF RESPONSE</u>
	130	Painfully Loud Limit Amplified Speech
Jet Takeoff at 200 feet .....	120	
Discotheque .....	120	Maximum Vocal Effort
Riveting Machine .....	110	
Jet Takeoff at 2,000 Feet		
Shout (0.5 feet) .....	100	Very Annoying
Heavy Diesel Truck at 50 feet ....	90	
Food Blender.....	90	
Garbage Disposal .....	90	
Loud Radio or Hi-Fi .....	80	Annoying
Freight Train at 50 feet.....	80	
Cash Register .....	70	Complaining Possible
Typical Large Store.....	60	
Automobile (Average) 35-40 m.p.h..	60	
Air Conditioning Unit at 20 feet .	60	
Residence		Acceptance
Quiet Conference Room .....	50	Quiet
Living Room .....	40	
Bedroom .....	30	
Whisper at 5 feet .....	30	Very Quiet
Rustling of Leaves, Broadcast		
Studio .....	20	
	10	Just Audible
Faintest Possible Sound .....	0	Threshold of Hearing

SOURCE: Howard Needles Tammen & Bergendoff, 1973

These intrusions of sound can disturb or interrupt a person's train of thought and are associated with the 10 percent level. The maximum or peak sounds produced during any specific time period are associated with the 1 percent level. The mean sound level is at the 50 percent level and is about halfway between the 90 and 10 percent levels. The sound levels exceeded 90, 50, 10 and 1 percent of any specific time period are indicated by the designations  $L_{90}$ ,  $L_{50}$ ,  $L_{10}$  and  $L_1$  respectively.

While many rating methods are used to compare sounds with different spectra, the simplest method correlates with human response. The weighting curve which simulates human response the best is called the "A" scale and the level so measured is called the "A weight sound level". The A-level of a sound can be conveniently measured by all U.S. and International standard sound level meters as they include an electrical filter which corresponds to the "A" weighting curve.

#### Sound Guidelines

The guidelines used in this analysis are the recommended goals of the United States Environmental Protection Agency and the U.S. Department of Labor's Occupational Health and Safety Division. Table II shows EPA's defined information on levels on environmental noise requisite to protect public health and welfare with an adequate margin of safety March 1974. Also the Labor Department's Occupational Health and Safety Requirements are shown

in Tables III and IV, for general and construction. These tables represent the latest thinking of governmental agencies on the noise levels that individuals should be subjected to both on the job and off the job.

TABLE II

YEARLY AVERAGE\* EQUIVALENT SOUND LEVELS IDENTIFIED AS  
REQUISITE TO PROTECT THE PUBLIC HEALTH AND WELFARE WITH  
AN ADEQUATE MARGIN OF SAFETY

	Measure	Indoor Activity Inter- ference	Hearing Loss Conside- ration	To Protect Against Both Ef- fects (b)	Outdoor Activity Inter- ference	Hearing Loss Conside- ration	To Protect Against Both Ef- fects (b)
Residential with Out- side Space and Farm Residences	$L_{eq}$ $L_{eq}(24)$	45	70	45	55	70	55
Residential with No Outside Space	$L_{dn}$ $L_{eq}(24)$	45	70	45			
Commercial	$L_{eq}(24)$	(a)	70	70(c)	(a)	70	70(c)
Inside Transportation	$L_{eq}(24)$	(a)	70	(a)			
Industrial	$L_{eq}(24)(d)$	(a)	70	70(c)	(a)	70	70(c)
Hospitals	$L_{dn}$ $L_{eq}(24)$	45	70	45	55	70	55
Educational	$L_{eq}(24)$ $L_{eq}(24)(d)$	45	70	45	55	70	55
Recreational Areas	$L_{eq}(24)$	(a)	70	70(c)	(a)	70	70(c)
Park Land and General Unpopulated Areas	$L_{eq}(24)$				(a)	70	70(c)

CODE:

- a. Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity. (See Figure D-2 for noise levels as a function of distance which allow satisfactory communication.)
- b. Based on lowest level.
- c. Based only on hearing loss.
- d. an  $L_{eq}(24)$  of 75 dB may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average, i.e., no greater than an  $L_{eq}$  of 60 dB.

NOTE: Explanation of identified level for hearing loss: The exposure period which results in hearing loss at the identified level is a period of 40 years\* referred to energy rather than arithmetic averages.

OSHA REGULATIONS

Table III

NOISE: GENERAL

<u>DURATION</u>	<u>SOUND LEVEL dBA SLOW RESPONSE</u>
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Table IV

NOISE: CONSTRUCTION

<u>DURATION</u>	<u>SOUND LEVEL dBA SLOW RESPONSE</u>
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

### Existing Sound Levels

The sound levels in the New Orleans area are typical of a large urban area, with daytime L<sub>10</sub> sound levels ranging from 52 to 78 dBA and nighttime L<sub>10</sub> sound levels in the 46 to 63 dBA range. The highest L<sub>10</sub> sound level, 78 dBA, was recorded at three different locations. The first location was site 71, Bethel Evangelical Church of Christ on the corner of Franklin Avenue and Miro Street. The second was site 66, Gayarre School on Franklin Avenue and Robertson Street. Site 52 was the third location, and was located approximately 100 feet south of I-10 and west of Franklin Avenue. In all three of these readings, the sound level was due to traffic near the sites. The lowest L<sub>10</sub> sound level was recorded at site 48 on the NORD Playground on Patterson Road west of Elmira Avenue at 1:37 A.M. No traffic was observed during the 10 minute reading, resulting in the low 46 dBA L<sub>10</sub> sound level. The sounds monitored at this site were made up of many distant sounds that create a very dull hum, which is typical of large cities in the nation.

The purpose of the June, 1976 monitoring program was to measure sound levels during times of school operation, peak traffic conditions, and to monitor each site more than once to present ambient sound conditions that are typical in the study area.

Three readings were taken at each of 91 sites during the three day monitoring period, typifying the peak and off-peak traffic conditions, as well as a nighttime condition (after 9:00 P.M.).

The results of these measurements, Table V show three basic relationships among the readings taken at each site. The first relationship is one of little variation in sound level with the time of day. These sites are usually located in a residential area of the city, where distant sound sources produce a nearly constant level. An example of this relationship is the data from site 42.

A second relationship is one of little variation throughout the day, with a drop in the sound level at night. This type of site is usually located in an area with high daytime activity. Site 48 is a good example of this relationship. Shipping activity on the river near the NORD Playground on Patterson Road produced nearly constant sound levels of 60 and 62 dBA in the daytime, while at night the sound level dropped to 46 dBA  $L_{10}$ . Sites that show this relationship due to traffic related sound sources are sites 44 and 81, their daytime activity being arterial traffic and freeway traffic, respectively.

The last relationship is one in which the sound levels vary greatly throughout the day. This high variance is due to the constantly changing activity near the site, which causes

higher sound levels to be experienced regularly throughout the day. Site 8, the open area south of Guste Elementary School, is an example of this relationship. Children playing in the area at different times of day cause higher sound levels near the school. The open area is commonly used by children as a play area. Another example is site 85, the MORD Playground on Atlantic and Lamarque Streets. The intermittent operation of machinery in the General Electric Building east of the playground caused higher sound levels during the off-peak and night periods than during the peak traffic periods.

TAKEN FROM: -

Information on levels on environmental noise requisite to protect public health and welfare with an adequate margin of safety, March 1974, EPA 550/9-74-004.

TABLE Y

## FIELD RESULTS AND PROJECTED SOUND LEVELS

SITE NO.	TIME	DATE	LOCATION DESCRIPTION	TRUCKS <sup>a</sup>	CARS <sup>a</sup>	L <sub>10</sub> dBA	2000 Predicted		
							PARALLEL	PRESS STREET	Degree of Impact
							L <sub>10</sub> Sound Level (dBA)	DO NOTHING	
1	12:45-12:55 p.m.	7-9-74	Playground - Calliope Housing Project	20	234	70	72/Moderate	72/Moderate	71/Moderate
2	1:15-1:35 p.m.	7-9-74	Malpoeana Ave. & Niro	9	155	73	74/Moderate	75/Moderate	74/Moderate
3	1:45-2:05 p.m.	7-9-74	S.F. Williams School	17	183	71	72/Moderate	73/Moderate	72/Moderate
4	2:15-2:25 p.m.	7-9-74	Booker T. Washington School	20	157	77	77/Severe	77/Severe	77/Severe
5	2:45-2:55 p.m.	7-9-74	Poydras & Bolivar	49	236	73	N/A	N/A	N/A
6	3:15-3:25 p.m.	7-9-74	Hotel Dieu Hospital	77 <sup>b</sup>	431 <sup>b</sup>	63 <sup>c</sup>	N/A	N/A	N/A
7	4:45-4:55 p.m.	7-9-74	McDonogh School #36	-	-	59	N/A	N/A	N/A
8	3:45-3:55 p.m.	7-9-74	Church on Claiborne South of Felicity	30	299	75	77/Severe	77/Severe	77/Severe
9	4:30-4:40 p.m.	7-9-74	Guste Elementary School	-	-	67	67/None	N/A	N/A
	2:29-2:39 a.m.	6-10-76		-	-	49			
	7:43-7:53 a.m.	6-18-76		-	-	56			
	10:58-11:08 a.m.	6-7-76		-	-	61			
10	5:10-5:30 p.m.	7-9-74	Guste Housing Project	14	218	68	70/None	70/None	70/None
11	7:30-7:40 a.m.	7-10-74	Louise Day Care Center	J	J	70	69/None	69/None	72/Moderate
	12:53-1:03 a.m.	6-9-76	on Cliffo	J	J	63			
	2:35-2:45 p.m.	6-7-76		J	J	68			
	5:00-5:10 p.m.	6-8-76		J	J	66			
	11:02-11:12 p.m.	6-8-76		J	J	62			

C-1-15

	12	7:45-8:04 a.m.	7-10-74	Coliseum Square	20	200	68	69/None	70/None	70/None
	13	8:20-8:40 a.m.	7-10-74	Gloryland Mt. Gillion Baptist Church	31	239	75	78/Severe	77/Severe	77/Severe
	14	8:45-8:55 a.m.	7-10-74	St. John Church	73 <sup>b</sup>	636 <sup>b</sup>	74	76/Severe	76/Severe	76/Severe
	15	9:15-9:25 a.m.	7-10-74	U.S. Post Office - Loyola St.	21	312	66	68/None	68/None	68/None
		8:20-8:30 a.m.	6-8-76		14	180	64			
		12:52-1:02 p.m.	6-7-76		10	261	59			
		11:50-12:10 a.m.	6-8-76		4	153	57			
	16	9:45-9:55 a.m.	7-10-74	Lee Circle	15	201	74	76/Severe	76/Severe	77/Severe
	17	10:15-10:25 a.m.	7-10-74	Lafayette Square	9	248	66	N/A	N/A	N/A
	18	10:50-11:10 a.m.	7-10-74	Rabouin Jr. High School	10	177	69	N/A	N/A	N/A
C-1-116	19	12:00-12:20 p.m.	7-10-74	Industrial Area-Calliope & Magazine	25	256	77	78/Severe	78/Severe	78/Severe
	20	12:30-12:50 p.m.	2-10-74	Annunciation Square	24	157	63	N/A	N/A	N/A
	21	1:05-1:15 p.m.	7-10-74	Train Yard - Front St. & Terpischoe	26 <sup>b</sup>	269 <sup>b</sup>	67	N/A	N/A	N/A
	22	4:10-4:30 p.m.	7-10-74	St. Anthony School - Franklin St. N. of Burnmaster	16	234	69	71/Moderate	73/Moderate	71/Moderate
	23	5:10-5:30 p.m.	7-10-74	McDonogh #26-Madison St.	5	183	63	N/A	N/A	N/A
	24	7:45-7:55 a.m.	7-11-74	Henderson Elem. School	49 <sup>b</sup>	886 <sup>b</sup>	60	69/Moderate 65/None <sup>m</sup>	66/Moderate 64/None <sup>m</sup>	61/None
	25	8:00-8:10 a.m.	7-11-74	Mr. J. Fischer Homes - Wall Blvd.	74 <sup>b</sup>	954 <sup>b</sup>	68	77/Severe 70/None <sup>m</sup>	72/Moderate 68/None <sup>m</sup>	69/None
		9:39-9:49 a.m.	6-8-76		70	711	68			
		4:01-4:11 p.m.	6-7-76		51	688	72			
		11:29-11:39 p.m.	6-9-76		11	357	63			

26	8:20-8:30 a.m.	7-11-74	Hendee St. 50' from G.M.O. Bridge	55 <sup>b</sup>	764 <sup>b</sup>	74	75/Moderate 70/None <sup>m</sup>	74/Moderate 70/None <sup>m</sup>	75/Moderate
27	8:35-8:45 a.m.	7-11-74	Hendee St. 100' from G.M.O. Bridge	68 <sup>b</sup>	672 <sup>b</sup>	73	77/Severe 70/None <sup>m</sup>	73/Moderate 70/None <sup>m</sup>	74/Moderate
28	8:55-9:05 a.m.	7-11-74	William Fischer Homes 120' from Freeway	71 <sup>b</sup>	728 <sup>b</sup>	71	74/Moderate 70/None	71/Moderate 70/None	72/Moderate
29	9:15-9:25 a.m.	7-11-74	William Fischer Homes 400' from Freeway	51 <sup>b</sup>	654 <sup>b</sup>	67	72/Moderate 67/None <sup>m</sup>	67/None 67/None <sup>m</sup>	68/None
30	9:40-9:50 a.m.	7-11-74	McDonoghville Cemetery	70 <sup>b</sup>	674 <sup>b</sup>	79 <sup>d</sup>	N/A	N/A	N/A
31	10:05-10:25 a.m.	7-11-74	Lion's Club Building	10	137	66	68/None	68/None	68/None
32	11:00-11:10 a.m.	7-11-74	McDonogh Playground	-	-	66	N/A	N/A	N/A
33	11:25-11:35 a.m.	7-11-74	Residential-Magellan & Monroe	-	-	67	N/A	N/A	N/A
34	11:40-11:50 a.m.	7-11-74	Residential-Columbus & Monroe	-	-	68	N/A	N/A	N/A
35	12:05-12:15 p.m.	7-11-74	McDonogh School #27	-	-	55	63/Moderate	67/Moderate	57/None
36	1:30-1:40 p.m.	7-11-74	Cemetery-Hunez & DeArmas	59 <sup>b</sup>	669 <sup>b</sup>	55	57/None	56/None	57/None
37	1:50-2:00 p.m.	7-11-74	McDonogh School #32	61 <sup>b</sup>	635 <sup>b</sup>	60	N/A	N/A	N/A
38	2:10-2:20 p.m.	7-11-74	NORD Playground - Lamarque St.	68 <sup>b</sup>	650 <sup>b</sup>	60	N/A	63/Moderate	62/None
39	7:50-8:00 a.m.	6-10-76	Schwarz Elementary School	J	J	59	62/None	60/None	60/None
	2:35-2:45 p.m.	7-11-74		J	J	64			
	2:40-2:50 p.m.	6-8-76	(inside school-2nd floor)	J	J	56			
	2:40-2:50 p.m.	6-8-76		J	J	60			
	12:00-12:10 a.m.	6-10-76		J	J	54			

	40	3:10-3:20 p.m.	7-11-74	Second Good Hope Church	-	-	60	N/A	N/A	N/A
	41	3:25-3:45 p.m.	7-11-74	Belman Jr. High School	6	141	65	67/None	67/None	67/None
	42	1:20-1:30 a.m.	6-10-76	Residential - LeBoeuf N. of Opelousas	-	-	54			
		9:30-9:48 a.m.	6-7-76		-	-	59	61/None	63/None	61/None
		4:00-4:10 p.m.	7-11-74		-	-	56			
		4:18-4:38 p.m.	6-8-76		2	156				
	43	4:35-4:45 p.m.	7-11-74	Adolf Meyer Elem. School	4	211	74	76/Severe	76/Severe	76/Severe
	44	12:59-1:09 a.m.	6-10-76	Landry Jr. High School	-	-	58			
		7:45-8:05 a.m.	6-8-76		13	179	65			
		10:04-10:24 a.m.	6-7-76		23	190	65			
		5:00-5:20 p.m.	7-11-74		7	266	66	68/None	67/None	68/None
	45	5:50-6:00 p.m.	7-11-74	Arden Cahill Academy	-	-	53	66/Moderate	N/A	N/A
	46	5:30-5:50 p.m.	7-29-74	Parish Trade School	3	142	64	N/A	N/A	N/A
	47	6:05-6:15 p.m.	7-29-74	Holy Name of Mary School	-	-	57	N/A	N/A	N/A
	48	1:37-1:47 a.m.	6-10-76	MORO Playground-Eloina & Patterson	-	-	46			
		7:15-7:25 a.m.	6-8-76		1	27	62	N/A	N/A	N/A
		9:00-9:10 a.m.	6-7-76		-	6	60			
		6:25-6:35 p.m.	7-29-74		-	-	56			
	49	6:45-6:55 p.m.	7-29-74	Residential-LeBoeuf & Allix	-	-	58	N/A	59/None	N/A
	50	6:45-6:55 a.m.	7-30-74	150' N. of I-10 on Peoples Ave.	61	200	70	73/Moderate	73/Moderate	74/Moderate
	51	7:05-7:15 a.m.	7-30-74	Downtown Church of the Nazarene	6	171	72	74/Moderate	74/Moderate	74/Moderate

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52	7:25-7:35 a.m.	7-30-74	700' S. of I-10 W. of Franklin Avenue	39 <sup>b</sup>	440 <sup>b</sup>	78	80/Severe	80/Severe	80/Severe
53	7:50-8:00 a.m.	7-30-74	Carver Jr. -Sr. High School	-	-	56	N/A	N/A	N/A
54	8:00-8:10 a.m.	7-30-74	St. Philip School	-	-	55	N/A	N/A	N/A
55	8:20-8:30 a.m.	7-30-74	Community Center-Playground Benefit and Montegut	-	-	55	N/A	64/Moderate	N/A
56	8:45-8:55 a.m.	7-30-74	Lockett School	-	-	58	N/A	N/A	N/A
57	9:00-9:10 a.m.	7-30-74	Mary of the Angels School	-	-	57	N/A	N/A	N/A
58	9:20-9:30 a.m.	7-30-74	Bunny Friend Playground Roman & Gallier	-	-	59	N/A	N/A	N/A
59	9:45-9:55 a.m.	7-30-74	Claiborne and Desire	44 <sup>f</sup>	359 <sup>f</sup>	67	69/None	69/None	69/None
60	10:35-10:45 a.m.	7-30-74	Prieur and Montegut	-	-	52	N/A	64 Moderate	N/A
61	10:35-11:05 a.m.	7-30-74	Cemetery Urquhart and Villere St.	-	-	48	N/A	N/A	N/A
62	11:20-11:30 a.m.	7-30-74	Palmer School	-	-	59			
	1:03-1:33 p.m.	6-7-76		-	-	61			
	3:40-4:10 p.m.	6-7-76		-	34	58	N/A	N/A	N/A
	9:20-9:30 p.m.	6-7-76		-	-	62			
63	11:35-11:45 a.m.	7-30-74	Holy Angels Academy	23	213	75	77/Severe	77/Severe	77/Severe
64	12:00-12:10 p.m.	7-30-74	NDRD Playground - Piety and Royal	-	-	60	N/A	N/A	N/A
65	12:30-12:40 p.m.	7-30-74	St. Vincent De Paul Church Buildings	-	-	59	N/A	N/A	N/A

	66	1:20-1:30 p.m.	7-30-74	Gayarre School	37 <sup>g</sup>	300 <sup>g</sup>	78	80/Severe	80/Severe	80/Severe
	67	1:45-1:55 p.m.	7-30-74	St. Roch Shrine	-	-	57	N/A	N/A	N/A
	68	2:00-2:20 p.m.	7-30-74	St. Paul Lutheran Church	23	163	70	72/Moderate	72/Moderate	72/Moderate
	69	2:45-2:55 p.m.	7-30-74	Charles J. Colton School	8	226	68	70/None	70/None	70/None
	70	3:05-3:15 p.m.	7-30-74	First Lutheran Church School	19	173	63	65/None	65/None	65/None
	71	3:25-3:35 p.m.	7-30-74	Bethel Evangelical Church of Christ	27	236	78	80/Severe	80/Severe	80/Severe
	72	3:50-4:00 p.m.	7-30-74	McCue Playground	15	295	64	66/None	66/None	66/None
	73	5:20-5:50 p.m.	7-30-74	Residential - Willow & Vernon	-	-	69	N/A	N/A	N/A
C-1-20	74	5:40-5:50 p.m.	7-30-74	West Bank School for the Retarded	-	-	57	N/A	N/A	N/A
	75	6:45-7:05 a.m.	7-31-74	William Hart Elementary School	12	216	65	67/None	69/None	67/None
	76	7:15-7:25 a.m.	7-31-74	Gretna Elementary School No. 2	-	-	56	N/A	N/A	N/A
	77	7:35-7:45 a.m.	7-31-74	Cemetery - N.E. of Lafayette St., N.W. of West Bank Expressway	27 <sup>h</sup>	402 <sup>h</sup>	67	69/None	69/None	69/None
	78	8:10-8:20 a.m.	7-31-74	St. Mark United Church of Christ Services	-	-	58	N/A	N/A	N/A
	79	8:30-8:40 a.m.	7-31-74	Archbishop Blenk High School	3	159	63	N/A	N/A	N/A
	80	2:14-2:24 a.m.	6-10-76	Guste Housing Project	J	J	53	68/Moderate	N/A	N/A
		7:24-7:34 a.m.	6-8-76		J	J	63			
		1:15-1:25 p.m.	6-7-76		J	J	66			
	81	2:46-2:56 a.m.	6-10-76	St. John's Church	J	J	57	70/None	66/None	68/None
		8:00-8:10 a.m.	6-8-76		J	J	67			

82	12:34-12:44 a.m.	6-9-76	Carondelet St.-N. of Freeway	-	-	57	71/Moderate	71/Moderate	71/Moderate
	8:00-8:20 a.m.	6-10-76		12	240	70			
	2:09-2:19 a.m.	6-7-76		9	74	69			
83	9:08-9:18 a.m.	6-8-76	McDonoghville Cemetery -	-	-	59	62/None	60/None	60/None
	3:43-3:53 p.m.	6-7-76	Semmes & Bodenger	-	-	59			
	11:47-11:57 p.m.	6-9-76		-	-	53			
84	10:59-11:09 a.m.	6-9-76	McDonogh School #27	-	-	62	64/None	69/Moderate	66/None
	3:28-3:48 p.m.	6-8-76	(inside school)	7	97	49			
	4:24-4:44 p.m.	6-7-76		-	130	64			
	11:12-11:22 p.m.	6-9-76		-	-	55			
85	8:33-8:43 a.m.	6-9-76	NORD Playground - Atlantic	1	18	57	60/None	69/Moderate	59/None
	11:34-12:04 p.m.	6-7-76	St. N. of Lamarque	2	87	59			
	12:28-12:38 a.m.	6-10-76		-	-	63			
86	10:44-10:54 a.m.	6-8-76	Residential - Numa St. East of	-	-	53	62/Moderate	60/Moderate	N/A
	3:17-3:27 p.m.	6-7-76	Toll Area	-	-	54			
	10:55-11:05 p.m.	6-9-76		-	-	57			
87	2:20-2:30 p.m.	6-7-76	Residential - Benefit St. W. of	-	-	52	N/A	68/Moderate	N/A
	4:45-4:55 p.m.	6-7-76	Press	-	-	57			
	10:20-10:30 p.m.	6-7-76		-	-	55			
88	1:50 -2:00 p.m.	6-7-76	Residential - St. Ferdinand N.	-	-	52	N/A	66/Moderate	N/A
	4:30-4:40 p.m.	6-7-76	of Prieur	-	-	57			
	9:40-9:50 p.m.	6-7-76		-	-	55			
89	8:45-8:55 a.m.	6-8-76	Thayer Ave.N. of Lamarque St.	3	23	55	N/A	75/Severe 70/Moderate <sup>m</sup>	57/None
	10:47-11:15 a.m.	6-7-76		3	73	57			
	12:45-12:55 a.m.	6-10-76		4	196	52			
90	2:52-3:02 p.m.	6-7-76	Sage St. W. of Peoples Ave.	K	K	56	57/None	69/Moderate	57/None
	5:24-5:34 p.m.	6-7-76		K	K	55			
	10:00-10:10 p.m.	6-7-76		K	K	58			

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91	9:55 -10:07 a.m.	6-9-76	Industrial - Taylor St. and	73	348	69			
	5:44 -5:54 p.m.	6-7-76	Laltram Lane	31	462	64	71/Moderate	71/Moderate	73/Moderate
	10:12-10:22 p.m.	6-9-76		4	111	57			

a Observed traffic during measurement period.

b Traffic counts include vehicles on street directly adjacent to the location and all vehicles visible on the freeway.

c L<sub>10</sub> sound level approximately three decibels high due to cars picking up and discharging passengers in front of hospital.

d Lawnmowers operating in the area raised L<sub>10</sub> approximately 10 decibels.

e Too close to bridge to see traffic.

f Volumes include eastbound traffic on Robertson and westbound on Claiborne.

g Volumes include traffic on Robertson and Franklin.

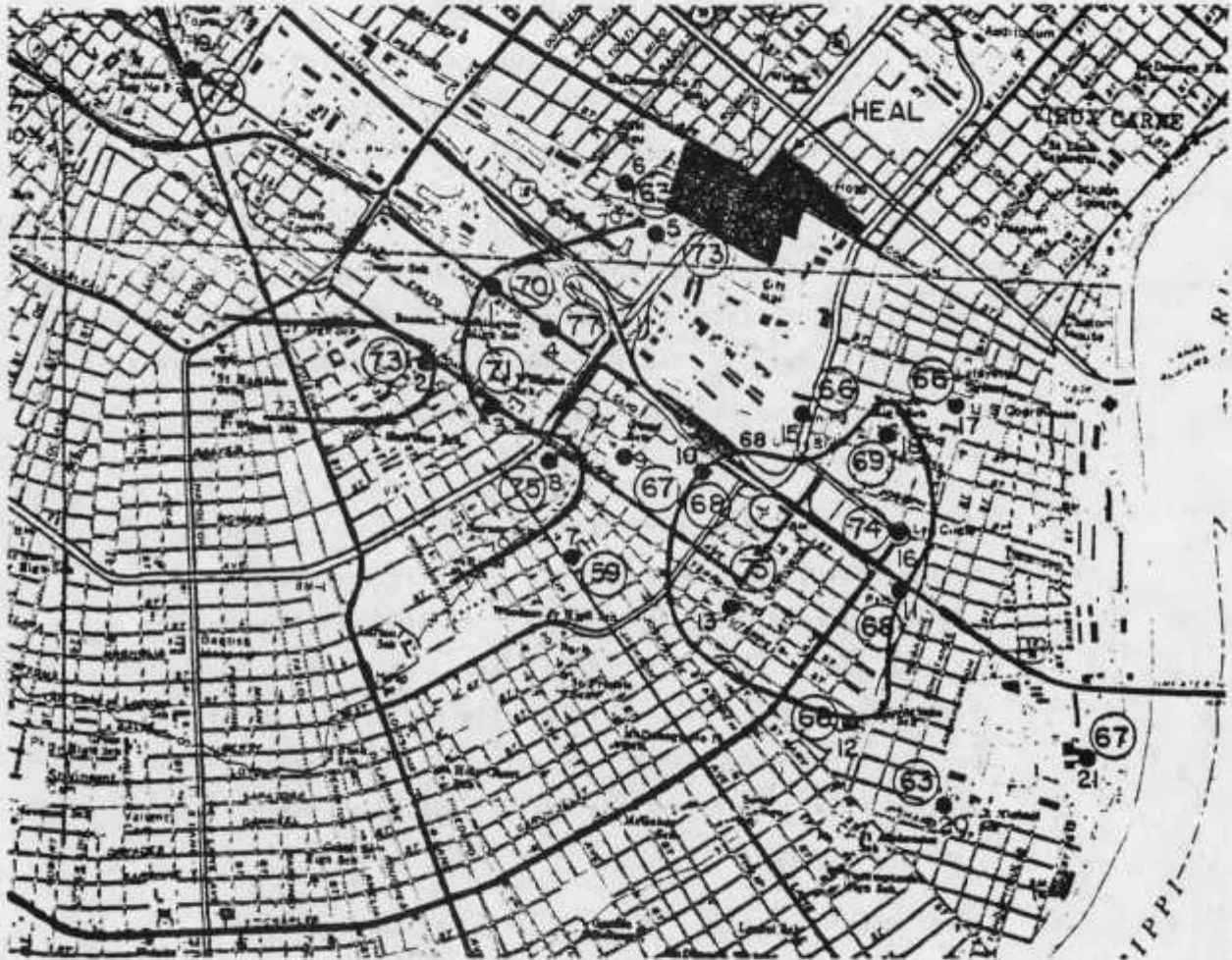
h Visible traffic on the West Bank Expressway.

j Too far from bridge or buildings blocked view of bridge to accurately count vehicles.

k Traffic on I-10 not visible from site.

m Projected sound level and impact with the construction of recommended barriers.

# EXISTING NOISE LEVELS CENTRAL BUSINESS DISTRICT NEW ORLEANS, LA.



## LEGEND

FIG. I

- LOCATION NOISE MEASUREMENT
- 13 LOCATION CODE NUMBER SEE TABLE
- (75) NOISE LEVEL dBA TAKEN BETWEEN  
3:00 P.M. TO 5:00 P.M.
- 66 EXISTING NOISE CONTOUR

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### Meteorology

Meteorological conditions are an important determinant of an area's air quality. Atmospheric processes govern the formation, transport and dispersion of air pollutants. Meteorological conditions, plus topographical effects, determine the concentrations of air pollutants as they travel from source to receptor.

The climate of Orleans Parish and northern Jefferson Parish is largely influenced by the many lakes and streams and the Gulf of Mexico. These water areas moderate the meteorological conditions, such as temperature and humidity, thus reducing the range between extremes.

The average maximum yearly temperature is 78.2° F, with a corresponding minimum of 59.0° F. Monthly temperature maximums vary from 90.7° F to 64.4° F, with monthly minimums ranging from 73.0°F to 44.8°F. Average rainfall is 53.9 inches per year with an average daily humidity range of 63 percent to 33 percent. An average of 33 percent of the days are clear, with the remainder being equally divided between cloudy and partly cloudy.

Most probable meteorological conditions and worst case conditions were determined from a classification system for atmospheric stability. Atmospheric stability is the

characteristic of a given layer or layers of air to control vertical motion throughout the layers. Low level atmospheric stability is determined primarily by net radiation (incoming short wave solar radiation versus outgoing long wave radiation.)

Stable atmospheric conditions will reduce vertical motion, restrict vertical dispersion and dilution of pollutants. Stability occurs with an excess of outgoing radiation and light winds. Neutral atmospheric conditions represent an optimum condition for both vertical and horizontal dispersion and dilution of pollutants. Neutral conditions occur with overcast skies or high wind speeds. Unstable atmospheric conditions, which increase vertical motion, improve the vertical dispersion and dilution of pollutants. Instability occurs with an excess of incoming solar radiation and low wind speed.

The stability classes are defined as follows: A) extremely unstable, B) unstable C) slightly unstable, D) neutral. E) slightly stable, F) stable and G) extremely stable.

Another important meteorological parameter is the mixing height. The mixing height is defined as the vertical limit of thorough horizontal and vertical mixing of the atmosphere.

Meteorological conditions for New Orleans are presented in Table VI . The most probable or typical conditions used for this study include Class D stability, a 6.7 meter per second wind out of the north, and an 800 meter mixing height.

Worst case meteorological conditions utilized Class D stability with a one meter per second wind blowing and a 500 meter mixing height.

TABLE VI  
METEOROLOGICAL CONDITIONS

SEASON	MOST PROBABLE STABILITY CLASS	RELATIVE FREQUENCY %	WIND DIRECTION	WIND SPEED (meters/second)
WINTER (December) (January) (February)	D	59.0	N	5.7 - 8.2
SPRING (March) (April) (May)	D	44.2	S	5.7 - 10.8
SUMMER (June) (July) (August)	G	32.3	W	1.5
AUTUMN (September) (October) (November)	D	34.3	N	5.7 - 8.2

C-1-27

SOURCE: Wind Distribution by Pasquill Stability Classes, Star Program, #12916, New Orleans, La., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Center, Asheville, N.C.

## 2.0 POSSIBLE ODOR AND AIR POLLUTANT SOURCES

Table VII shows the major stationary sources of air/odor pollutants in New Orleans. In addition to these stationary sources, one other major source of air/odor pollution exists, that is, transportation.

The effects of these sources on the project area are not felt to be important for three major reasons. They are as follows:

1. Weather Conditions - The weather and climate of New Orleans is such that dispersal of air pollutants is usually the case.
2. Implementation plan of the State Air Quality Section of the Louisiana Department of Health. The plan, when implemented, will result in the elimination of almost one half of the present emissions of air pollutants in New Orleans from stationary sources.
3. Current Levels - The current levels of air pollutants in New Orleans are below the requirements of the State and Federal Governments. (See enclosed report on Air Pollution Index - Section entitled "Monitoring (or Not Monitoring) New Orleans Air".)

TABLE VII

MAJOR SOURCES OF AIR POLLUTION IN NEW ORLEANS, LOUISIANA \*

1. U.S. Gypsum, Westwego, Louisiana
2. Lone Star Industries Incorporated
3. Kaiser Aluminum & Chemical Corporation
4. Tenneco Oil Company
5. Murphy Oil Corporation
6. Lake Grain
7. New Orleans Public Grain
8. City of New Orleans Asphalt Plant
9. Public Bulk Terminal
10. Thompson-Hayward Chemical Company
11. Radcliff Materials Incorporated
12. N.D. E. Incinerator
13. St. Louis Street Incinerator
14. Florida Street Incinerator
15. 7th Street Incinerator
16. Hendee Street Incinerator
17. Chevron Chemical Company
18. Avondale Shipyards, Incorporated, Service Foundry Division
19. Boh Brothers - Asphalt Plant
20. Celotex Corporation
21. Johns-Manville Products Corporation
22. Standard Paint & Varnish Company

\* "Implementation Plan", The Louisiana Air Control Commission,  
(January, 1972) Revised (November 21, 1972)

### 3.0 Existing Levels

The available data on ambient concentrations of several air pollutants in New Orleans are presented in this section. Some data were available from public agencies and some were from company files. Data are available on carbon monoxide, ozone, particulates, sulfur dioxide and nitrogen dioxide. Carbon monoxide emissions from this ICES project will be negligible, so the change from existing conditions due to this project will be insignificant. Ozone is a secondary pollutant (it is generated in atmospheric chemical processes from other air pollutants rather than emitted directly from pollution sources), and generally considered to be correlated with mobile source emissions, so the change from existing conditions due to this project will be insignificant. Particulates, sulfur dioxide and nitrogen dioxide are potential pollutants from this ICES project. As will be seen, the concentration levels of these pollutants are within the Primary Ambient Air Quality Standards in the demonstration area. Particulates do now exceed the Secondary Standards, so special attention will be paid to removing particulates from the stack gases in this ICES.

The existing carbon monoxide air quality for the New Orleans area was obtained from field monitoring data collected during the five day period of July 22, 1974 through July 26, 1974 (Table VIII). Carbon monoxide (CO) readings were taken at 15 locations. Sampling was conducted in the downtown CBD area, the West Bank area and the Press Street area. These readings were continuous measurements, generally from 7 a.m. to 6 p.m.

The locations of these sampling sites near the two alternate corridors are suitable to estimate existing carbon monoxide levels in the area of the proposed project.

Field monitoring data in the downtown CBD area showed the second highest one-hour and eight-hour averages for carbon monoxide were 8.2 parts per million (ppm) and 4.9 ppm, respectively. The Environmental Protection Agency recommends using the second highest monitoring value as the concentration to be rolled back for future carbon monoxide background concentrations. However, the highest monitored carbon monoxide concentrations for one-hour and eight-hour averages were 8.3 ppm and 4.4 ppm. In the West Bank area and Press Street area the second highest one-hour and eight-hour averages for carbon monoxide were 6.3 ppm and 3.1 ppm. The highest monitored carbon monoxide concentrations for one-hour and eight-hour averages were 7.2 ppm and 4.1 ppm. These field concentrations were slightly higher than the sampling data obtained from the Louisiana Air Control Commission for the downtown CBD area. Those data indicated the highest one-hour concentration occurring near the project site in 1974 was 4.5 ppm.

None of the areas currently exceed the National Ambient Air Quality Standard for carbon monoxide shown in Table XIII. These national standards were set "allowing an adequate margin of safety are requisite to protect human health."<sup>6</sup> The agency within the State of Louisiana that is responsible for implemen-

tation of the air quality standards is the State Board of Health through the Louisiana Air Control Commission.

Contours of existing carbon monoxide levels around the HEAL Complex are shown on Figure II.

TABLE VIII  
AIR QUALITY MONITORING LOCATIONS

<u>DATE</u>	<u>DURATION</u>	<u>DESCRIPTION</u>
7-22-74	7:00 a.m. - 6:00 p.m.	Clfo St. South of Dryades St.
7-22-74	2:00 p.m. - 6:00 p.m.	Falstaff Plant-Earhart Blvd. & Roman Street
7-22-74	7:20 a.m. - 6:00 p.m.	Coliseum Square
7-23-74	7:30 a.m. - 6:00 p.m.	Post Office Parking Lot
7-23-74	7:25 a.m. - 6:00 p.m.	McDonough School #27
7-23-74	7:05 a.m. - 6:00 p.m.	Lafayette Square
7-24-74	7:30 a.m. - 6:00 p.m.	Florida Ave. No. of Almonaster Ave.
7-24-74	7:05 a.m. - 6:00 p.m.	Playground - Piety St. & Royal St.
7-24-74	7:21 a.m. - 3:42 a.m.	Carver Jr. - Sr. High School
7-25-74	6:58 a.m. - 6:00 p.m.	Miss. River Bridge Toll Gate
7-25-74	12:00 Noon - 6:00 p.m.	Playground-Patterson St. & Elmira Ave.
7-25-74	7:15 a.m. - 3:20 p.m.	Water Station-Elmira Ave. & DeArmas St.
7-26-74	7:10 a.m. - 6:00 p.m.	Holiday Inn - Gretna
7-26-74	8:40 a.m. - 5:55 p.m.	Donner Canal at Bender Dr.
7-26-74	7:15 a.m. - 6:00 p.m.	Parish Trade School-First St. & Ocean St.

# CARBON MONOXIDE LEVELS CENTRAL BUSINESS DISTRICT NEW ORLEANS, LA.



LEGEND

FIG. II

- LOCATION CARBON MONOXIDE MEASUREMENT
- 10 LOCATION CODE NUMBER SEE TABLE
- ③.₈ CARBON MONOXIDE LEVEL (PPM) HIGHEST 8 HR. VALUE TAKEN BETWEEN 6:00AM. - 6:00PM.
- 3.₈ EXISTING CARBON MONOXIDE CONTOUR

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Sampling data on ozone ( $O_3$ ) from the New Orleans Health Department indicates that New Orleans does not have seriously high levels of this pollutant. Six months of sampling data during 1973 and 1974 did not show any violation. The highest recorded  $O_3$  concentration in those data was a maximum 1 hour average of .074 ppm, compared to a standard of .08 ppm. Concentrations were very low, i.e., .021 ppm, in the month of July, when concentrations would normally be expected to be near the highest. Table IX shows some more recent ozone data. This shows some excessive ozone levels, but since stationary source emissions are not responsible for ozone, this is not important to this study. Considering these data, New Orleans does not appear to have a serious oxidant problem.

TABLE   IX  

LOUISIANA AIR CONTROL COMMISSION  
 AIR QUALITY DATA NEW ORLEANS  
 CIVIL COURT BUILDING 1976  
 OZONE

<u>DATE</u>	<u>HIGHEST MEASUREMENT</u>	<u>2ND HIGHEST</u>	<u>PVI0</u>	<u># OBS</u>
1/1/76		0.0620 ppm.	0	98
1/23/76	0.0660 ppm			
2/19/76		0.0850 ppm	6	73
2/28/76	0.0960 ppm			
3/11/76		0.0510	0	98
3/24/76	0.0530			
9/8/76		0.0840	3	40
9/16/76	0.0890			
10/2/76	0.1180		34	75
10/3/76		0.1090		
11/7/76	0.0810	0.0760	1	96
12/4/76	0.0510	0.0490	0	98

Data from the Louisiana Health Department are shown in Table X.

Sampling data indicate that New Orleans does not have serious Air Pollution problems at the present time as can be seen by a comparison of the data in Table X versus the State and Federal Guidelines in Tables XI & XII.

TABLE XLOUISIANA AIR CONTROL COMMISSION-AIR QUALITY DATA  
NEW ORLEANS CIVIL COURT BUILDING  
1976

	<u>POLLUTANT</u>		
	<u>PARTICULATE</u>	<u>SO<sub>2</sub></u>	<u>NO<sub>2</sub></u>
Highest	119 ug/m <sup>3</sup>	6 ug/m <sup>3</sup>	48 ug/m <sup>3</sup>
2nd Highest	116 ug/m <sup>3</sup>	4 ug/m <sup>3</sup>	46 ug/m <sup>3</sup>
# Primary VIO	0	0	0
# Sec VIO	0	0	0
Geom. Mean	62 ug/m <sup>3</sup>	1.3 ug/m <sup>3</sup>	19.4 ug/m <sup>3</sup>

#### 4.0 State and Federal Air Quality Standards

Table XI presents current state air quality criteria. Also Table XII presents current Federal requirements. Table XIII presents emission requirements for new stationary sources of air pollution. It can be seen by a comparison of the existing measurements to the existing State and Federal Guidelines that the current levels are not violating the Governmental Guidelines, with one exception. This exception is the Oxidant levels which were measured in 1976. It is readily seen that some violations have occurred; however, since the emissions requirements for stationary sources do not address oxidants it is of only of passing interest and should not affect this study.

According to the state implementation plan the New Orleans area is in the southern Louisiana Region. In this region the priorities for each of the major pollutants are as follows:

<u>AIR POLLUTANT</u>	<u>PRIORITY</u>
Particulate	11
SO <sub>2</sub>	1
CO	111
NO <sub>2</sub>	111
HC(OX)	1

**TABLE XI**  
**PRIMARY**  
**AMBIENT AIR QUALITY STANDARDS**

AIR CONTAMINANT	STANDARDS MAXIMUM PERMISSIBLE CONCENTRATION
Suspended Particulate	75 $\mu\text{g}/\text{m}^3$ (Annual geometric mean) 260 $\mu\text{g}/\text{m}^3$ (Maximum 24 hr. concentration not to be exceeded more than once per year)
Dustfall	20 tons per square mile per month.
Coefficient of Haze	0.6 (coh/1000 linear feet) (annual geo. mean) 0.75 (coh/1000 linear feet) (annual arith. mean) 1.50 (coh/1000 linear feet) (24 hr. average)
Sulfur Dioxide (SO <sub>2</sub> )	80 $\mu\text{g}/\text{m}^3$ or 0.03 ppm (annual arith. mean) 365 $\mu\text{g}/\text{m}^3$ or 0.14 ppm (Maximum 24 hr. concentration not to be exceeded more than once per year)
Sulfur Acid Mist Sulfur Trioxide, or any combination thereof	4 $\mu\text{g}/\text{m}^3$ (Maximum annual average) 12 $\mu\text{g}/\text{m}^3$ (24 hr. average, not to be exceeded over 1% of the time) 30 $\mu\text{g}/\text{m}^3$ (1 hr. average, not to be exceeded over 1% of the time)
Carbon Monoxide (CO)	10,000 $\mu\text{g}/\text{m}^3$ or 9ppm (Maximum 8 hr. concentration not to be exceeded more than once per year) 40,000 $\mu\text{g}/\text{m}^3$ or 35ppm (Maximum 1 hr. concentration not to be exceeded more than once per year)
Carbon Monoxide (CO)	10,000 $\mu\text{g}/\text{m}^3$ or 9 ppm (Maximum 8 hr. concentration not to be exceeded more than once per year) 40,000 $\mu\text{g}/\text{m}^3$ or 35 ppm (Maximum 1 hr. concentration not to be exceeded more than once per year)

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TABLE XI - CONT'D

## PRIMARY

## AMBIENT AIR QUALITY STANDARDS

AIR CONTAMINANT	STANDARDS MAXIMUM PERMISSIBLE CONCENTRATION
* Hydrocarbons (other than Methane)	160 ug/m <sup>3</sup> (0.24 ppm) (Maximum 3 hr. concentration not to be exceeded more than once per year)
Total Oxidants	58.8 ug/m <sup>3</sup> 0.03 ppm (annual arith. mean) 98.0 ug/m <sup>3</sup> 0.05 ppm (4 hr. maximum) 160 ug/m <sup>3</sup> 0.08 ppm (maximum 1 hr. concentration not to be exceeded more than once per year)
Nitrogen Dioxide (NO <sub>2</sub> )	100 ug/m <sup>3</sup> (0.05 ppm) (annual arith. mean)

The contribution of any contaminant by a single source property shall be measured as the difference between the upwind level and the downwind level for the property, using methods approved by the Commission, or by the use of suitable engineering techniques such as source-dispersion calculations.

\* Revised December 18, 1973

\*TABLE XIa

SECONDARY

AMBIENT AIR QUALITY STANDARDS

AIR CONTAMINANT	STANDARDS MAXIMUM PERMISSIBLE CONCENTRATION
Suspended Particulate	60 ug/m <sup>3</sup> (Annual geometric mean) 150 ug/m <sup>3</sup> (Maximum 24 hr. concentration not to be exceeded more than once per year)
Sulfur Dioxide (SO <sub>2</sub> )	60 ug/m <sup>3</sup> or 0.02 ppm (Annual arith. mean) 260 ug/m <sup>3</sup> or 0.10 ppm (Maximum 24 hr. concentration not to be exceeded more than once per year) 1300 ug/m <sup>3</sup> (Maximum 3 hr. concentration not to be exceeded more than once per year)
Carbon Monoxide (Other than Methane)	10,000 ug/m <sup>3</sup> or 9 ppm (Maximum 8 hr. concentration not to be exceeded more than once per year)
Total Oxidants	58.8 ug/m <sup>3</sup> 0.03 ppm (annual arithmetic mean) 98.0 ug/m <sup>3</sup> 0.05 ppm (4 hr. Maximum) 160 ug/m <sup>3</sup> 0.08 ppm (Maximum 1 hr. concentration not to be exceeded more than once per year)
Nitrogen Dioxide (NO <sub>2</sub> )	100 ug/m <sup>3</sup> (0.05 ppm) (annual arithmetic mean)

The contributions of any contaminant by a single source property shall be measured as the difference between the upwind level and the downwind level for the property, using methods approved by the Commission, or by the use of suitable engineering techniques such as source-dispersion calculations.

TABLE XII  
 EPA - REGULATIONS  
 AIR POLLUTION

FEDERAL REQUIREMENTS:

<u>POLLUTANT</u>	<u>ANNUAL AVG.</u>	<u>24 HR. MAX/YR.</u>	<u>3 HR. MAX.</u>
SO <sub>2</sub> (primary) <sup>1</sup> (secondary) <sup>2</sup>	80 ug/m <sup>3</sup> 60 ug/m <sup>3</sup>	365 ug/m <sup>3</sup> 260 ug/m <sup>3</sup>	1300 ug/m <sup>3</sup> /yr.
Particulate (1) (2)	75 ug/m <sup>3</sup> 60 ug/m <sup>3</sup>	260 ug/m <sup>3</sup> 150 ug/m <sup>3</sup>	
CO <sub>2</sub>	(1)&(2) 10 mg/m <sup>3</sup> - 8 hr.	40 mg/m <sup>3</sup> - 1 Hr.	
Ox	(1)&(2) 160 ug/m <sup>3</sup> 1-hr.		
HC	(1)&(2) 160 ug/m <sup>3</sup> 3-hr.		
NO <sub>2</sub>	(1)&(2) 100 ug/m <sup>3</sup> Annual Arithmetic mean		

TABLE XIII

NATIONAL AND LOUISIANA AIR QUALITY STANDARDS  
(For Pollutants Related to Vehicular Emissions)

Suspended Particulate Matter (similar to EPA primary and secondary)	75	micrograms/cubic meter; annual geometric mean (primary standard)
	60	Micrograms/cubic meter; annual geometric mean (secondary standard)
	260	micrograms/cubic meter; max. 24 hour concentration, not to be exceeded more than once per year (primary standard)
	150	micrograms/cubic meter; 24 hour concentration, not more than once per year (secondary standard)
Carbon Monoxide (same as EPA primary and secondary)	9.0	ppm (10 milligrams/cubic meter), maximum 8 hour average, not more once per year.
	35	ppm (40 milligrams/cubic meter), maximum 1 hour average, not more than once a year.
Hydrocarbons (same as EPA primary and secondary)	.24	ppm (160 micrograms/cubic meter) maximum 3 hour concentration measured from 0600 to 0900, not to be exceeded more than once per year.
Nitrogen Dioxide (similar to EPA primary)	.25	ppm (100 micrograms/cubic meter), annual arithmetic mean
Total Oxidants (same as EPA primary and secondary)	.08	ppm (160 micrograms/cubic meter), maximum 1 hour average, not more than once per year.
	.03	ppm (58.8 micrograms/cubic meter), annual arithmetic mean
	.05	ppm (98.0 micrograms/cubic meter), 4 hour maximum

SOURCE: Louisiana Air Pollution Control Regulations, Ambient Air Quality Standards, August 16, 1973.

EPA - REGULATIONS

AIR POLLUTION -  $250 \times 10^6$  BTU/Hr.

Fossil Fuel

SO <sub>2</sub>	liquid	0.80 lb./10 <sup>6</sup> BTU	2 Hr. Avg.
	solid	1.2 lb./10 <sup>6</sup> BTU	2 Hr. Avg.
NO <sub>2</sub>	liquid	0.3 lb./10 <sup>6</sup> BTU	2 hr. Avg.
	solid	0.70 lb./10 <sup>6</sup> BTU	2 hr. Avg.
	gaseous	0.21 lb./10 <sup>6</sup> BTU	2 hr. Avg.

Emission Monitoring

Photoelectric smoke detector and recorder except gaseous fuels

Continuous monitoring and recording of SO<sub>2</sub> and NO<sub>2</sub> except gaseous fuels.

TABLE XIV  
 NEW ORLEANS MISSISSIPPI RIVER BRIDGE  
 CARBON MONOXIDE FIELD DATA - EIGHT HOUR AVERAGES

<u>STATION</u>	<u>HIGHEST 8-HR. AVERAGE</u>
1. Ohio & Dryades	4.3 ppm
2. Post Office Parking Lot	3.8 ppm
3. Florida Ave. & Almonaster	3.1 ppm
4. Mississippi River Br. Toll Gate	2.6 ppm
5. Holiday Inn - Gretna	1.8 ppm
6. McDonough School #27	4.1 ppm
7. Piety & Royal	3.4 ppm
8. Patterson & Elmira	4.0 ppm
9. Bonner Canal at Bender Drive	2.6 ppm
10. Coliseum Square	4.4 ppm
11. Lafayette Square	4.4 ppm
12. Elmira & DeArmas	0.7 ppm
13. Carver Jr.-Sr. High School	3.2 ppm
14. Parish Trade School	2.5 ppm

# HNTB

HOWARD NEEDLES TAMMEN & BERGENCOFF

## NEW ORLEANS MISSISSIPPI RIVER BRIDGE CARBON MONOXIDE FIELD DATA (ONE-HOUR AVERAGES)

### Cite Street & Dryades Street 7/22/74

7:00 - 8:00	am	8.3	ppm
8:00 - 9:00	am	4.1	
9:00 - 10:00	am	4.3	
10:00 - 11:00	am	4.5	
11:00 - 12:00	noon	4.2	
12:00 - 1:00	pm	3.6	
1:00 - 2:00	pm	3.2	
2:00 - 3:00	pm	3.4	
3:00 - 4:00	pm	3.1	
4:00 - 5:00	pm	3.2	
5:00 - 6:00	pm	3.1	

### Mississippi River Bridge Toll Gate 7/25/74

6:53 - 7:53	am	7.2	ppm
7:53 - 8:53	am	1.9	
8:53 - 9:53	am	1.2	
9:53 - 10:53	am	2.5	
10:53 - 11:53	am	1.5	
11:53 - 12:53	pm	0.7	
12:53 - 1:53	pm	0.5	
1:53 - 2:53	pm	2.0	
2:53 - 3:53	pm	2.9	
3:53 - 4:53	pm	5.3	
4:53 - 5:53	pm	5.4	

### Post Office Parking Lot 7/23/74 (Loyola Avenue)

7:00 - 8:00	am	5.7	ppm
8:00 - 9:00	am	3.1	
9:00 - 10:00	am	1.4	
10:00 - 11:00	am	2.1	
11:00 - 12:00	noon	4.9	
12:00 - 1:00	pm	4.8	
2:00 - 3:00	pm	5.3	
3:00 - 4:00	pm	6.8	
4:00 - 5:00	pm	5.9	
5:00 - 6:00	pm	8.2	

### Holiday Inn - Gretna 7/26/74

7:16 - 8:16	am	3.0	ppm
8:16 - 9:16	am	2.7	
9:16 - 10:16	am	2.5	
10:16 - 11:16	am	1.4	
11:16 - 12:16	pm	1.9	
12:16 - 1:16	pm	1.5	
1:16 - 2:16	pm	0.7	
2:16 - 3:16	pm	1.0	
3:16 - 4:16	pm	0.8	
4:16 - 5:16	pm	2.8	
5:00 - 6:00	pm	3.9	

### Florida Ave. & Almonester Ave. 7/24/74

7:30 - 8:30	am	6.3	ppm
8:30 - 9:30	am	4.9	
9:00 - 10:00	am	1.7	
10:00 - 11:00	am	1.6	
11:00 - 12:00	noon	1.7	
12:00 - 1:00	pm	2.7	
1:00 - 2:00	pm	4.4	
2:00 - 3:00	pm	1.9	
3:00 - 4:00	pm	1.8	
4:00 - 5:00	pm	2.6	

### Earhart Blvd. & Roman St. 7/22/74

2:00 - 3:00	pm	4.3	ppm
3:00 - 4:00	pm	4.5	
4:00 - 5:00	pm	5.0	
5:00 - 6:00	pm	3.6	

# HNTB

HOWARD NEEDLES TAMMEN & BERGENDOFF

## NEW ORLEANS MISSISSIPPI RIVER BRIDGE CARBON MONOXIDE FIELD DATA (CONTINUED) (ONE-HOUR AVERAGES)

### Piety Street & Royal Street 7/24/74

7:05 - 8:05	am	4.2	ppm
8:35 - 9:35	am	3.3	
9:05 - 10:05	am	3.6	
10:05 - 11:05	am	2.3	

### Patterson Street & Elaine Avenue 7/25/74

12:00 - 1:00	pm	1.2	ppm
1:00 - 2:00	pm	3.3	
2:00 - 3:00	pm	5.7	
3:00 - 4:00	pm	7.4	
4:00 - 5:00	pm	4.6	
5:00 - 6:00	pm	2.7	

### Donner Canal at Bender Drive 7/26/74

8:40 - 9:40	am	2.7	ppm
9:40 - 10:40	am	2.5	
10:40 - 11:40	am	3.2	
11:40 - 12:40	am	2.7	
12:40 - 1:40	pm	3.0	
1:40 - 2:40	pm	3.0	
2:40 - 3:40	pm	2.1	
3:40 - 4:40	pm	1.9	

### Coliseum Square 7/22/74

7:20 - 8:20	am	4.8	ppm
8:20 - 9:20	am	3.9	
9:20 - 10:20	am	3.2	
10:20 - 11:20	am	3.2	
11:20 - 12:20	pm	3.0	
2:00 - 3:00	pm	2.9	
3:00 - 4:00	pm	3.4	
4:00 - 5:00	pm	4.4	
5:00 - 6:00	pm	6.4	

### Lafayette Square 7/23/74

7:05 - 8:00	am	6.0	ppm
8:00 - 9:00	am	4.2	
9:00 - 10:00	am	4.1	
10:00 - 11:00	am	3.8	
11:00 - 12:00	noon	4.2	
12:00 - 1:00	pm	3.3	
1:00 - 2:00	pm	4.4	
2:00 - 3:00	pm	3.6	
3:00 - 4:00	pm	3.7	
4:00 - 5:00	pm	4.2	
5:00 - 5:45	pm	7.1	

### Carver Jr.-Sr. High School 7/24/74

7:21 - 8:00	am	3.2	ppm
8:00 - 9:00	am	4.3	
9:00 - 10:00	am	4.3	
10:00 - 11:00	am	2.1	
11:00 - 12:00	noon	2.5	
12:00 - 1:00	pm	3.2	

### Elaine Avenue & DeArmas 7/25/74

7:15 - 8:00	am	1.3	ppm
8:00 - 9:00	am	2.7	
9:00 - 10:00	am	0.2	
10:00 - 11:00	am	0.1	
11:00 - 12:00	noon	0.1	
12:00 - 1:00	pm	0.1	
1:00 - 2:00	pm	0.1	
2:00 - 3:00	pm	1.4	
3:00 - 4:00	pm	0.7	

# HNTB

HOWARD NEEDLES TAMMEN & BERGENDOFF

NEW ORLEANS MISSISSIPPI RIVER BRIDGE  
CARBON MONOXIDE FIELD DATA (CONTINUED)  
(ONE-HOUR AVERAGES)

Parish Trade School First Street & Ocean Street 7/26/74		McDonough School #27 7/23/74					
7:15 - 8:15	am	2.5	ppm	7:25 - 8:25	am	8.1	ppm
8:15 - 9:15	am	2.0		8:25 - 9:25	am	5.1	
9:15 - 10:15	am	2.0		9:25 - 10:25	am	2.9	
10:15 - 11:15	am	2.2		10:25 - 11:25	am	2.7	
11:15 - 12:15	pm	2.3		11:25 - 12:25	pm	2.7	
12:15 - 1:15	pm	2.0		12:25 - 1:25	pm	3.0	
1:15 - 2:15	pm	2.6		1:25 - 2:25	pm	4.5	
2:15 - 3:15	pm	2.7		2:25 - 3:25	pm	4.3	
3:15 - 4:15	pm	3.1		3:25 - 4:25	pm	3.9	
4:15 - 5:15	pm	2.5		4:25 - 5:25	pm	3.4	
5:15 - 6:15	pm	2.1		5:25 - 6:25	pm	3.0	

(EIGHT-HOUR AVERAGES)

Ohio Street & Dryades Street 7/22/74		Mississippi River Bridge Toll Gate 7/25/74					
7:00 - 3:00	pm	4.4	ppm	6:53 - 2:53	pm	2.1	ppm
8:00 - 4:00	pm	3.9		7:53 - 3:53	pm	1.6	
9:00 - 5:00	pm	3.7		8:53 - 4:53	pm	2.0	
10:00 - 6:00	pm	3.6		9:53 - 5:53	pm	2.6	

Post Office Parking Lot 7/23/74 (Loyola Avenue)		Holiday Inn - Gretna 7/26/74					
7:00 - 3:00	pm	3.8	ppm	7:16 - 3:16	pm	1.8	ppm
8:00 - 4:00	pm	3.8		8:16 - 4:16	pm	1.5	
9:00 - 5:00	pm	4.2		9:16 - 5:16	pm	1.6	
10:00 - 6:00	pm	5.1		10:16 - 6:00	pm	1.7	

Florida Ave. & Almonester Ave. 7/24/74		McDonough-School #27 7/23/74					
7:30 - 3:00	pm	3.1	ppm	7:25 - 3:25	pm	4.1	ppm
8:30 - 4:00	pm	2.5		8:25 - 4:25	pm	3.7	
9:00 - 5:00	pm	2.3		9:25 - 5:25	pm	3.5	
				10:25 - 6:25	pm	3.6	

# HNTB

HOWARD NEEDLES TAMMEN & BERGENDOFF

NEW ORLEANS MISSISSIPPI RIVER BRIDGE  
CARBON MONOXIDE FIELD DATA (CONTINUED)  
(EIGHT-HOUR AVERAGES)

<b>Platy Street &amp; Royal Street</b> 7/24/74		<b>Lafayette Square</b> 7/23/74	
7:05 - 11:00 am	3.4 ppm	7:05 - 3:00 pm	3.9 ppm
		8:00 - 4:00 pm	4.0
		9:00 - 5:00 pm	4.0
<b>Patterson Street &amp; Elmira Avenue</b> 7/25/74		10:00 - 5:45 pm	4.4
12:00 - 6:00 pm	4.0 ppm	<b>Elmira Avenue &amp; DeArmas</b> 7/25/74	
<b>Donner Canal at Bender Drive</b> 7/26/74		7:15 - 3:00 pm	0.7 ppm
8:40 - 4:40 pm	2.6 ppm	8:00 - 4:00 pm	0.7
<b>Colliseum Square</b> 7/22/74		<b>Carver Jr.-Sr. High School</b> 7/24/74	
7:20 - 3:00 pm	4.9 ppm	7:21 - 1:00 pm	3.2 ppm
8:20 - 4:00 pm	4.8	<b>Parish Trade School</b>	
9:20 - 5:00 pm	4.7	<b>First Street &amp; Ocean Street</b> 7/26/74	
10:20 - 6:00 pm	4.8	7:15 - 3:15 pm	2.2 ppm
		8:15 - 4:15 pm	2.4
		9:15 - 5:15 pm	2.4
		10:15 - 6:15 pm	2.5

Table 1.1-2. EMISSION FACTORS FOR BITUMINOUS COAL COMBUSTION WITHOUT CONTROL EQUIPMENT  
EMISSION FACTOR RATING: A

Furnace size, 10 <sup>6</sup> Btu/hr heat input <sup>a</sup>	Particulates <sup>b</sup>		Sulfur oxides <sup>c</sup>		Carbon monoxide		Hydro carbons <sup>d</sup>		Nitrogen oxides		Aldehydes	
	lb/ton coal burned	kg/MT coal burned	lb/ton coal burned	kg/MT coal burned	lb/ton coal burned	kg/MT coal burned	lb/ton coal burned	kg/MT coal burned	lb/ton coal burned	kg/MT coal burned	lb/ton coal burned	kg/MT coal burned
Greater than 100 <sup>e</sup> (Utility and large industrial boilers)												
Pulverized												
General	10A	8A	38S	19S	1	0.5	0.3	0.15	18	8	0.005	0.0025
Wet bottom	1.2A <sup>f</sup>	0.6A	38S	19S	1	0.5	0.3	0.15	30	15	0.005	0.0025
Dry bottom	17A	0.5A	38S	19S	1	0.5	0.3	0.15	18	8	0.005	0.0025
Cyclone	2A	1A	38S	19S	1	0.5	0.3	0.15	55	27.5	0.005	0.0025
10 to 100 <sup>e</sup> (large commercial and general industrial boilers)												
Spreader stoker <sup>h</sup>	1.2A <sup>f</sup>	0.5A	38S	19S	2	1	1	0.6	15	7.5	0.005	0.0025
Less than 10 <sup>e</sup> (commercial and domestic furnaces)												
Underfeed moker	2A	1A	38S	19S	10	5	3	1.5	0	3	0.005	0.0025
Hand fired units	20	10	38S	19S	90	45	20	10	3	1.5	0.005	0.0025

<sup>a</sup> 1 Btu/hr = 0.293 kW/hr  
<sup>b</sup> The factor A on all units other than hand-fired equipment indicates that the weight percentage of ash in the coal should be multiplied by the value given.  
 Example: If the factor is 10 and the ash content is 10 percent, the particulate emissions before the control equipment would be 10 times 10 or 100 pounds of particulates per ton of coal (10 times 0, or 00 kg of particulates per MT of coal).  
<sup>c</sup> S equals the sulfur content (see footnote b above).  
<sup>d</sup> Expressed as methane.  
<sup>e</sup> References 1 and 3 through 7.  
<sup>f</sup> Minus fly ash rejection.  
<sup>g</sup> References 1, 4, and 7 through 9.  
<sup>h</sup> For all other stokers use 8A for particulate emission factor.  
<sup>i</sup> Without fly ash rejection. With fly ash rejection use 20A. This value is not an emission factor but represents loading reaching the control equipment.  
<sup>j</sup> References 7, 8, and 10.

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External Combustion Sources

1.1-3

SOURCE: U.S. Department of Commerce, National Technical Information

Service - PB-254 274 "Compilation of Air Pollutant Emission

Factors" - Supplement No. 6 - Environmental Protection Agency

C-1-51

April, 1976

Table 1.3-1. EMISSION FACTORS FOR FUEL OIL COMBUSTION  
EMISSION FACTOR RATINGS: A

Pollutant	Type of boiler <sup>a</sup>					
	Power plants		Industrial and commercial		Domestic	
	lb/10 <sup>3</sup> gal	kg/10 <sup>3</sup> liter	lb/10 <sup>3</sup> gal	kg/10 <sup>3</sup> liter	lb/10 <sup>3</sup> gal	kg/10 <sup>3</sup> liter
Particulate <sup>b</sup>	c	c	e	e	2	0.26
Sulfur dioxide	16.75	186	18.75	186	14.25	173
Sulfur trioxide <sup>d</sup>	25	0.266	25	0.266	25	0.266
Carbon monoxide <sup>e</sup>	6	0.63	6	0.63	5	0.63
Hydrocarbons (total), as CH <sub>4</sub> <sup>f</sup>	1	0.12	1	0.12	1	0.12
Nitrogen oxides (total), as NO <sub>2</sub> <sup>g</sup>	105(50)(1)	12.6(6.25)(1)	60 <sup>h</sup>	7.0 <sup>i</sup>	22	2.9

<sup>a</sup> Emission rates for particulate, roughly, according to their gross displaced heat input rates, as shown below.

<sup>b</sup> Power plants for (1) boilers >200 x 10<sup>6</sup> Btu/hr

(2) >40 x 10<sup>6</sup> Btu/hr

Industrial boilers >10 x 10<sup>6</sup> Btu/hr

>3.7 x 10<sup>6</sup> Btu/hr

Commercial boilers >0.5 x 10<sup>6</sup> Btu/hr

>0.2 x 10<sup>6</sup> Btu/hr

Domestic (unretained) boilers <0.2 x 10<sup>6</sup> Btu/hr

<0.1 x 10<sup>6</sup> Btu/hr

<sup>c</sup> Based on Reference 3 through 6. Particulate is defined in this section as that material captured by EPA Method 5 (from test catchers).

<sup>d</sup> Particulate emission factors for residual oil combustions are best described, on the average, as a function of fuel oil sulfur content and sulfur content, as shown below.

Grade 0 oil: lb/10<sup>3</sup> gal = 10.1(9 + 3)

kg/10<sup>3</sup> liter = 1.26(11 + 0.28)

Grade 1 oil: lb/10<sup>3</sup> gal = 11.26(10 + 0.14)

kg/10<sup>3</sup> liter = 1.38(10 + 0.14)

Grade 2 oil: lb/10<sup>3</sup> gal = 12.46(9 + 0.14)

kg/10<sup>3</sup> liter = 1.50(9 + 0.14)

Grade 3 oil: lb/10<sup>3</sup> gal = 13.66(8 + 0.14)

kg/10<sup>3</sup> liter = 1.62(8 + 0.14)

Grade 4 oil: lb/10<sup>3</sup> gal = 14.86(7 + 0.14)

kg/10<sup>3</sup> liter = 1.74(7 + 0.14)

Grade 5 oil: lb/10<sup>3</sup> gal = 16.06(6 + 0.14)

kg/10<sup>3</sup> liter = 1.86(6 + 0.14)

Grade 6 oil: lb/10<sup>3</sup> gal = 17.26(5 + 0.14)

kg/10<sup>3</sup> liter = 1.98(5 + 0.14)

Grade 7 oil: lb/10<sup>3</sup> gal = 18.46(4 + 0.14)

kg/10<sup>3</sup> liter = 2.10(4 + 0.14)

Grade 8 oil: lb/10<sup>3</sup> gal = 19.66(3 + 0.14)

kg/10<sup>3</sup> liter = 2.22(3 + 0.14)

Grade 9 oil: lb/10<sup>3</sup> gal = 20.86(2 + 0.14)

kg/10<sup>3</sup> liter = 2.34(2 + 0.14)

Grade 10 oil: lb/10<sup>3</sup> gal = 22.06(1 + 0.14)

kg/10<sup>3</sup> liter = 2.46(1 + 0.14)

Grade 11 oil: lb/10<sup>3</sup> gal = 23.26(0 + 0.14)

kg/10<sup>3</sup> liter = 2.58(0 + 0.14)

Grade 12 oil: lb/10<sup>3</sup> gal = 24.46(-1 + 0.14)

kg/10<sup>3</sup> liter = 2.70(-1 + 0.14)

Grade 13 oil: lb/10<sup>3</sup> gal = 25.66(-2 + 0.14)

kg/10<sup>3</sup> liter = 2.82(-2 + 0.14)

Grade 14 oil: lb/10<sup>3</sup> gal = 26.86(-3 + 0.14)

kg/10<sup>3</sup> liter = 2.94(-3 + 0.14)

Grade 15 oil: lb/10<sup>3</sup> gal = 28.06(-4 + 0.14)

kg/10<sup>3</sup> liter = 3.06(-4 + 0.14)

Grade 16 oil: lb/10<sup>3</sup> gal = 29.26(-5 + 0.14)

kg/10<sup>3</sup> liter = 3.18(-5 + 0.14)

Grade 17 oil: lb/10<sup>3</sup> gal = 30.46(-6 + 0.14)

kg/10<sup>3</sup> liter = 3.30(-6 + 0.14)

Grade 18 oil: lb/10<sup>3</sup> gal = 31.66(-7 + 0.14)

kg/10<sup>3</sup> liter = 3.42(-7 + 0.14)

Grade 19 oil: lb/10<sup>3</sup> gal = 32.86(-8 + 0.14)

kg/10<sup>3</sup> liter = 3.54(-8 + 0.14)

<sup>b</sup> Based on Reference 1, 2 through 6, and 10. Hydrocarbon emissions are generally negligible unless oil is purposely cracked or not well maintained, in which case emissions may increase by several orders of magnitude.

<sup>c</sup> Based on Reference 1 through 6 and 8 through 11.

<sup>d</sup> Up to 50 lb/10<sup>3</sup> gal (45.25 kg/10<sup>3</sup> liter) for completely fluid boilers and 100 lb/10<sup>3</sup> gal (90.75 kg/10<sup>3</sup> liter) for all others, as full load, and normal (1.5 to 1.8 percent) excess air. At reduced loads, NO<sub>x</sub> emissions are reduced by 0.5 to 1 percent, on the average, for every percentage reduction in boiler load.

<sup>e</sup> Several combustion modification techniques can be employed for NO<sub>x</sub> reduction: (1) limited excess air firing can reduce NO<sub>x</sub> emissions by 5 to 20 percent, (2) staged combustion can reduce NO<sub>x</sub> emissions by 25 to 45 percent, and (3) flue gas recirculation can reduce NO<sub>x</sub> emissions by 14 to 45 percent. Combustion air preheating has been employed to reduce NO<sub>x</sub> emissions by as much as 80 percent in certain boilers. See section 1.4 for a discussion of these NO<sub>x</sub> reducing techniques.

<sup>f</sup> Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are strongly dependent on the fuel nitrogen content and can be estimated more accurately by the following empirical relationship:

$$E_{NO_x} = 0.00015 \text{ (lb/10}^3 \text{ gal)} = 0.00015 \text{ (kg/10}^3 \text{ liter)}$$

$$\text{where } E_{NO_x} \text{ is the nitrogen content, by weight, in the oil.}$$

<sup>g</sup> Based on Reference 2 through 6 and 8 through 10. Carbon monoxide emissions may increase by a factor of 10 to 100 if a unit is improperly operated or not well maintained.

<sup>h</sup> Based on Reference 1 through 6, 8, 9, 11, the percentage, by weight, of sulfur in the oil.

<sup>i</sup> Based on Reference 2 through 6 and 8 through 10. Carbon monoxide emissions may increase by a factor of 10 to 100 if a unit is improperly operated or not well maintained.

# AN AIR QUALITY INDEX FOR NEW ORLEANS\*

by Dee S. Dundee and Barry Render

Transit strikes and economic woes. Fewer tourists, closing public schools, and high unemployment. There is not a whole lot of good news being printed these days in New Orleans. (Even the *Louisiana Business Survey* must plead no contest.)

Inflation and recession. The list goes on. Corruption and pollution. Pollution? Wait a second! Let's take a look at the pollution in the New Orleans Metrolplex. How bad is it? How do we stack up with other cities? What do we even know about the quality of our city's air or water? (Perhaps we know more about the water than we care to.) The citizenry is aware of our cost-of-living and consumer-price levels, aware of the temperature, river, and tide levels. But who knows what our pollution level is?

We think we should know. We think everyone in New Orleans should. This article, written by a biology professor and a business professor, looks into what has been done and what could and should be done in the area to monitor air pollution. In an effort to create public awareness of a potentially dangerous situation, we have devised an Index to Air Quality for New Orleans.

## Pollution

As in so many other cities, tons of dust and other particulates rain down monthly on New Orleans. Our air also contains a variety of other pollutants, such as sulphur dioxide, nitrogen oxides, hydrocarbons, carbon monoxide, photochemical smog, and aerosols.

Much of this ultimately arrives in our fresh waters. Runoff from the land into the rivers, in addition to the above, plus everything else which is floatable or dissolvable. Such items are present as fertilizers, pesticides, herbicides, agricultural wastes, city street filth, highway pollution (the hydrocar-

bons, lead, oil, rubber, etc. from our vehicles). In addition to all of this, we dump tons of raw sewage into our rivers daily, and industries along those waterways contribute tons of various chemicals. Heat, radioactive wastes, and solid wastes are likewise received by our streams. (Remember Cleveland's Cuyahoga River which set itself on fire a few years back?)

Our air and water, without which we cannot survive, are being degraded regularly. Simultaneously, we are damaging other organisms (that includes plants) upon which our survival depends. Green plants are the source of our oxygen and basis for all of our food chains.

## The Clean Air Amendments

In response to the public demand for an improvement in the quality of the environment beginning in the late 1960's, Congress enacted several major pieces of environmental legislation, including the Clean Air Amendments of 1970. The Amendments required the setting of national ambient air quality standards and the attainment of those standards by mid-1975. And they represented the most vigorous and far-reaching attack on air pollution ever undertaken in the United States.

In conformity with federal regulations, the State of Louisiana (by way of the Louisiana Air Control Commission) announced, in 1972, the following:

"It is hereby declared to be the public policy of the State of Louisiana to achieve and maintain such levels of air quality as will protect human health and safety and to the greatest degree practicable prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this State and facilitate the enjoyment of the natural attractions of the State."<sup>1</sup>

<sup>1</sup> The Louisiana Air Control Commission, *Air Control Regulations*, August 1, 1972 (reprinted), p. 13.

\*The authors wish to express their appreciation to DBER graduate research assistant George Krug for his help in data collection and analysis.

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One goal of an Air Quality Index is to provide the layman with an easily understood evaluation of daily air pollution levels. . . .

Dee S. Dundee, a Professor of Biological Sciences at the University of New Orleans, was interested in ecological problems long before such interests were vogue. She has taught courses in ecology and has a number of publications in the field. Professor Dundee received her doctorate in biology at the University of Michigan.

Barry Render's business background complements that of his science-oriented co-author. He holds a Ph.D. in Operations Research from the University of Cincinnati and has conducted research in the areas of management, marketing, computers, and quantitative analysis. Dr. Render has a joint appointment at the University of New Orleans as Associate Director of the Division of Business and Economic Research and as Assistant Professor of Management.



The primary and secondary national ambient air quality standards set forth by the Environmental Protection Agency (EPA) were adopted without change as Louisiana state standards. (Several other states implemented more stringent guidelines, although Louisiana is considered one of the toughest enforcers of air quality regulations.) These standards for the major categories of air pollutants are illustrated in Table 1.

The determination of primary standards was based upon medical and scientific evidence as to (1) which pollutants had an adverse effect on public health and welfare, and (2) the concentration below which such pollutants had no demonstrable effect on human health. An "adequate margin of safety" was then added to the above value.<sup>1</sup>

Secondary standards, slightly stricter than the primary ones which were intended to protect public health, are designed to "protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutants in the ambient air."<sup>2</sup> Their intention is generally to minimize damage to property, soil, animals, and plants, and to combat deterioration in standards of public comfort and well-being.

#### An Air Quality Index for New Orleans

Many U. S. cities currently have Air Quality Indices which are made public on a daily basis through the local news media. The goal of such indices is usually twofold: (1) to provide the layman with an easily understood evaluation of daily air pollution levels, and (2) to create an aura of public awareness as to local problems and trends in the maintenance of good air quality.

<sup>1</sup>Jan R. Mansure, "Air Pollution in Texas: Implementing the 1970 Clean Air Amendments," *Texas Business Review*, September, 1974.

<sup>2</sup>Environmental Protection Agency, *The Clean Air Act*, Washington, D.C., 1970, p. 11.

These goals are not inappropriate to the New Orleans area. We are surely not giants in the field of industrial pollution. New Orleans has nothing resembling the filth-spewing smokestacks of a Birmingham, a Cincinnati, or a Detroit. But if we do have air quality control problems, or if our air purity is gradually declining to the level of America's industrial capitals, now is the time to monitor, to measure, to record, and to report.

TABLE 1. LOUISIANA PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS

	$\mu\text{g}/\text{m}^3$ <sup>1</sup>	$\text{ppm}$ <sup>2</sup>
<b>Particulates</b>		
<b>Primary</b>		
Geometric mean (annual)	75	
24-hour maximum	260	
<b>Secondary</b>		
Geometric mean (annual)	68	
24-hour maximum	158	
<b>Sulfur dioxide</b>		
<b>Primary</b>		
Arithmetic mean (annual)	58	.08
24-hour maximum	365	.14
<b>Secondary</b>		
3-hour maximum	1,308	.5
<b>Carbon monoxide</b>		
<b>Primary and secondary</b>		
8-hour maximum	10,000 (18 mg) <sup>3</sup>	9.0
1-hour maximum	40,000 (40 mg)	35.0
<b>Oxidants</b>		
<b>Primary and secondary</b>		
1-hour maximum	168	.08
<b>Hydrocarbons</b>		
<b>Primary and secondary</b>		
3-hour maximum	150	.24
<b>Nitrogen dioxide</b>		
<b>Primary and secondary</b>		
Arithmetic mean (annual)	100	.80

<sup>1</sup>Micrograms per cubic meter.

<sup>2</sup>Parts per million.

<sup>3</sup>Milligrams per cubic meter.

Source: *Podomi Register* 38 (April 30, 1971); *Federal Register* 38 (September 14, 1973).

Ideally, we should have liked to derive from our study an overall index, one which would have included air, water, solid wastes, thermal, noise, and radioactivity. Measurements of a good many of these are not available in New Orleans and doubtless will not be for some time. (As it is, we seem to have difficulties even measuring the air, a point we shall return to shortly.)

In retreating to the sole consideration of air quality, we recognize that there are five major pollutants to be considered:

1. Sulphur Dioxide (from coal burning and other industries)
2. Particulates (dust, fallout from stacks, etc.)
3. Carbon Monoxide (auto exhaust)
4. Photochemical Oxidants (ozone and peroxyacetyl nitrate from synergistic reactions)
5. Nitrogen Dioxide (engines, power plants, other combustion)

In addition to the primary and secondary air quality standards which have been established for each of these pollutants (as outlined in Table 1), episodic conditions defined as Alert, Warning, and Emergency levels were set down by the EPA during the Ruckelshaus administration. These are presented in Table 2.

The foundation for calculating an Air Quality Index for New Orleans (patterned after studies in Cincinnati and Washington, D. C.)<sup>1</sup> is the effect

of each pollutant as determined by the Louisiana primary and secondary standards and the EPA Alert, Warning, and Emergency levels. Secondary standards for all pollutants are assigned an arbitrary Index value of 50—values below this level are described as "very good to excellent" air quality because there are no known effects in this range.

Louisiana primary standards are defined to be at a value of 100—values between 50 and 100 are described as "fair to good" air quality because there are no known human health effects, but there are plant and material damages.

The three stages of the episode system designed to protect public health from short-term effects determine the Index values 200 and above. The Alert criteria are assigned the level of 200, the Warning stage is given the value of 300, and the Emergency stage is assigned 400. All of these Index values are summarized in Table 3.

Curves were then plotted employing the above values as shown in Figures 1-5. To use this Index in New Orleans (actually, since all standards employed are state and national, its application is valid throughout all of Louisiana), one simply follows three steps:

1. Measure the concentration (in the appropriate time base) for any one of the five pollutants.
2. Read the corresponding Index value from the proper graph.
3. Report to the media the highest Index value as that day's "selective" Index.

<sup>1</sup>Ohio Environmental Protection Agency, Ohio Air Quality Index, Cuyahoga Falls, Ohio, February 6, 1973, and Metropolitan Washington Council on Governments, Air Quality

Index, Report No. 1 of the Air Quality Planning Committee Regional Air Pollution Advisory Board, Washington, D. C., November, 1973.

TABLE 2. NATIONAL EPISODIC AIR QUALITY LEVELS

<b>"Alert"</b> The Alert level is that concentration of pollutants at which first stage control actions are to begin. An Alert will be declared when any one of the following levels is reached at any monitoring site.	
SO <sub>2</sub> —800 $\mu\text{g}/\text{m}^3$ (163 p.p.m.), 24-hour average.	
Particulate—1.0 COHs or 375 $\mu\text{g}/\text{m}^3$ , 24-hour average.	
SO <sub>2</sub> and particulate combined—product of SO <sub>2</sub> , p.p.m., 24-hour average, and COHs equal to 0.2 or product of SO <sub>2</sub> , $\mu\text{g}/\text{m}^3$ , 24-hour average, and particulate $\mu\text{g}/\text{m}^3$ , 24-hour average equal to $85 \times 10^3$ .	
CO—17 mg/m <sup>3</sup> (15 p.p.m.), 8-hour average.	
Oxidant (O <sub>3</sub> )—200 $\mu\text{g}/\text{m}^3$ (101 p.p.m.), 1-hour average.	
NO <sub>2</sub> —1150 $\mu\text{g}/\text{m}^3$ (26 p.p.m.), 1-hour average; 282 $\mu\text{g}/\text{m}^3$ (10.8 p.p.m.), 24-hour average.	
and meteorological conditions are such the pollutant concentrations can be expected to remain at the above levels for twelve (12) or more hours or increase unless control actions are taken.	
<b>"Warning"</b> The warning level indicates that air quality is continuing to degrade and that additional control actions are necessary. A warning will be declared when any one of the following levels is reached at any monitoring site.	
SO <sub>2</sub> —1,200 $\mu\text{g}/\text{m}^3$ (24 p.p.m.), 24-hour average.	
Particulate—5.0 COHs or 750 $\mu\text{g}/\text{m}^3$ , 24-hour average.	
SO <sub>2</sub> and particulate combined—product of SO <sub>2</sub> , p.p.m., 24-hour average and COHs equal to 1.0 or product of SO <sub>2</sub> , $\mu\text{g}/\text{m}^3$ , 24-hour average and particulate $\mu\text{g}/\text{m}^3$ , 24-hour average equal to $327 \times 10^3$ .	
CO—34 mg/m <sup>3</sup> (30 p.p.m.), 8-hour average.	
Oxidant (O <sub>3</sub> )—300 $\mu\text{g}/\text{m}^3$ (15 p.p.m.), 1-hour average.	
NO <sub>2</sub> —1,280 $\mu\text{g}/\text{m}^3$ (28 p.p.m.), 1-hour average; 385 $\mu\text{g}/\text{m}^3$ (10.3 p.p.m.), 24-hour average.	
and meteorological conditions are such that pollutant concentrations can be expected to remain at the above levels for twelve (12) or more hours or increase unless control actions are taken.	
<b>"Emergency"</b> The emergency level indicates that air quality is continuing to degrade to a level that should never be reached and that the most stringent control actions are necessary. An emergency will be declared when any one of the following levels is reached at any monitoring site.	
SO <sub>2</sub> —2,200 $\mu\text{g}/\text{m}^3$ (44 p.p.m.), 24-hour average.	
Particulate—10 COHs or 1,000 $\mu\text{g}/\text{m}^3$ , 24-hour average.	
SO <sub>2</sub> and particulate combined—product of SO <sub>2</sub> , p.p.m., 24-hour average and COHs equal to 1.0 or product of SO <sub>2</sub> , $\mu\text{g}/\text{m}^3$ , 24-hour average and particulate $\mu\text{g}/\text{m}^3$ , 24-hour average equal to $550 \times 10^3$ .	
CO—66 mg/m <sup>3</sup> (60 p.p.m.), 8-hour average.	
Oxidant (O <sub>3</sub> )—1,200 $\mu\text{g}/\text{m}^3$ (60 p.p.m.), 1-hour average.	
NO <sub>2</sub> —3,000 $\mu\text{g}/\text{m}^3$ (66 p.p.m.), 1-hour average; 756 $\mu\text{g}/\text{m}^3$ (21 p.p.m.), 24-hour average.	

Source: Federal Register, Vol. 36 (August 14, 1971)

**TABLE 3. AIR QUALITY DESCRIPTORS**

New Orleans Index Number	Effect	Air Quality Index Adjective
0-49	No known effects	Very good-Excellent
50-99	Damage to plants and materials	Fair-Good
100		Louisiana Clean Air Standard
101-149	Long-term damage to human health	Unsatisfactory-Poor
150-199	Increasing long-term damage to human health	Unhealthy
200-249	Short-term effects to health of sensitive persons	Hazardous
250-299	Short-term severe effects to health of general public	Dangerous
300	Very severe damage to human health	Very Dangerous

**Monitoring (or Not Monitoring) New Orleans Air**

For a program of air quality monitoring to be complete, an index for one-hour ambient concentrations of sulphur dioxide, particulate matter, carbon monoxide, photochemical oxidants, and nitrogen dioxide should be issued twice daily. Air would be considered to be of high quality if our city were to not exceed the Clear Air Standard, an Index value of 100, more than once a year.

However, measurements of all of the five important pollutants are, at present, not even being made in New Orleans on a daily basis. It appears that of the five only sulphur dioxide, carbon monoxide, and oxidants levels are available. The authors were unable to establish if and when the other two will be considered for inclusion. Nonetheless, for purposes of illustration, we were determined to sample several months of past data to try to establish some sort of range which at least incorporated the measurements which are available.<sup>2</sup>

Daily measurements from the months of June-July, 1974 and from November-December, 1974, were recorded and translated into an Index value. Generally speaking, the ambient standard value of 100 was seldom exceeded, although on December 5, 1974, an Air Quality Index of 202 hazardous, was recorded. The majority of the days saw an Index between 25 and 50.

These values must be considered biased (towards the desirable end of the scale) because of the information lack on two pollutants. A further complication results from the frequent collection equipment malfunctions. Out of 41 days recorded in the June-July period, on 13 days readings for sulphur dioxide were missing, on 22 days readings for carbon monoxide were missing, and on eight days readings for oxidants were not available. By November, the situation had not changed considerably, and "not available" filled over 25 percent of the recorded data files.

(Continued on Page 16)

<sup>2</sup>Data were obtained through the Louisiana Air Control Commission Laboratory, 325 Loyola Avenue, New Orleans

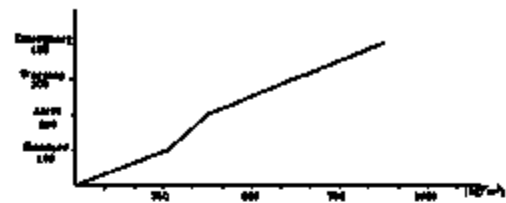


Figure 1. Particulate Matter (µg/m³)

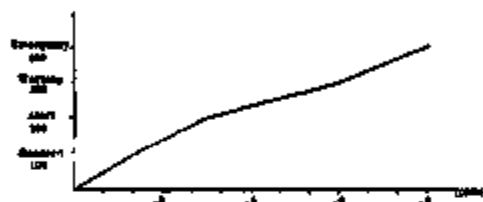


Figure 2. Sulphur Dioxide (ppm)

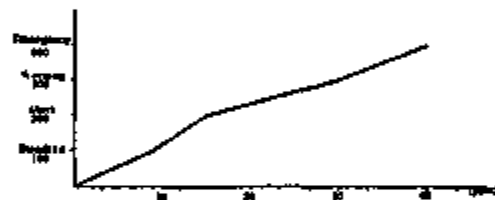


Figure 3. Carbon Monoxide (ppm)

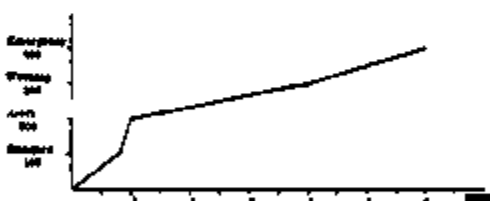


Figure 4. Oxidant (ppb)

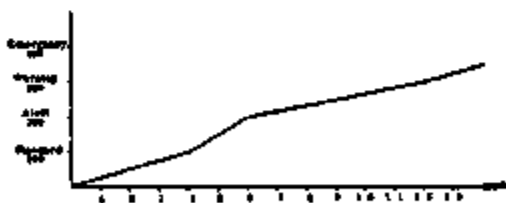


Figure 5. Nitrogen Dioxide (ppb)

**Where Do We Stand?**

*(Continued from Page 15)*

The quality of air in the New Orleans Metroplex would make many a big city mayor envious. But that is not to say that the air here is pure and that our lungs are pink. A test conducted by the New York-based Council on Municipal Performance, from 1968-1973, revealed that New Orleans ranks fourth in a list of 43 major cities in clear air. The city was seventh in the level of sulfur dioxide pollution, 11th in particulate matter, and 15th in nitrogen dioxide. The report also revealed that the amount of pollutants in the New

Orleans air has continued to rise over the past several years.

Our relative position is good at present. However, to maintain it we can and should begin to carefully monitor our city's pollutants; we must educate our citizenry to accept a stance of care and responsibility; and we ought to recognize the dangers of poor planning and neglect. New and more extensive monitoring equipment is needed—with it, perhaps the next issue of the *Louisiana Business Survey* can contain a daily summary of the past quarter's Air Quality Index.

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**APPENDIX D**

**FINANCING**

**EXHIBIT 4.3.C**

**EXHIBIT 4.3.D**

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HEALTH EDUCATION AUTHORITY OF LOUISIANA

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**General Resolution**

**Providing for the**

**Issuance of Revenue Bonds**

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ADOPTED MARCH 6, 1974

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EXHIBIT 4.3.g

D-7-1

**A GENERAL RESOLUTION PROVIDING FOR THE ISSUANCE OF REVENUE  
BONDS OF THE HEALTH EDUCATION AUTHORITY OF LOUISIANA**

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The following resolution was offered by Dr. Robert Charbonnet and seconded by Mr. C. C. Clifton, Jr.:

**A GENERAL RESOLUTION PROVIDING FOR THE ISSUANCE OF REVENUE  
BONDS OF THE HEALTH EDUCATION AUTHORITY OF LOUISIANA**

WHEREAS, the Health Education Authority of Louisiana (the "Authority") was created and exists under the provisions of Act No. 112 of the Regular Session of the Legislature of Louisiana for the year 1968, as amended (which Act as so amended now appears as La. R.S. 17:3051 to La. R.S. 17:3060, inclusive), in order to promote the medical and health educational activities of various public and private agencies in the State of Louisiana and to assist in the acquisition of land and construction and development of facilities for the use of entities of a multi-institutional medical complex in the New Orleans Metropolitan Area; and

WHEREAS, the Authority deems it necessary, in order to carry out its authorized purposes, to borrow money from time to time and to evidence such borrowings by the issuance of its Bonds hereunder and to secure the payment of the principal thereof and the interest and premium, if any, thereon and the performance and observance of the covenants and conditions herein contained; and

WHEREAS, the Bonds to be issued hereunder are to be issued from time to time pursuant to the provisions of an applicable Series Resolution and are not limited in aggregate principal amount except as provided herein;

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the Health Education Authority of Louisiana:

**ARTICLE I**

**DEFINITIONS AND BOND CONTRACT**

Section 1.01. Definitions. As used in this Resolution, unless a different meaning clearly appears from the context:

"Act" means Act 112 of the Regular Session of the Legislature of Louisiana for the year 1968 as amended, which Act as so amended now appears as La. R.S. 17:3051 to La. R.S. 17:3060, inclusive and all future acts supplemental thereto or amendatory thereof.

"Agreement" means an Agreement between the Authority and the Institution, relating to the Project described or defined in the Applicable Series Resolution.

"Annual Administrative Fee" means the annual fee for the general administrative services of the Authority in the amount stated or defined in the Applicable Series Resolution.

"Applicable Series Resolution" means the Series Resolution relating to a particular Project.

"Architect" means the Architect or firm of Architects designated or defined in the Applicable Series Resolution.

"Authority" means the Health Education Authority of Louisiana, the body corporate and public and instrumentality of the State of Louisiana created by the Act, regardless of whatever name it may be called, or if the Authority shall be abolished, the board, body, commission, department or officer succeeding to the principal functions of the Authority or to whom the powers vested in the Authority by the Act shall be given by Law.

"Authorized Newspaper" means The Daily Bond Buyer or any other publication carrying municipal bond notices and devoted primarily to financial news or the subject of state and municipal bonds, printed in the English language and customarily published at least once a day for at least five days (other than legal holidays) in each calendar week in the Borough of Manhattan, City and State of New York, or in the City of New Orleans, Louisiana, or, in the event that publication in any such Authorized Newspaper cannot be accomplished by reason of suspension of publication or otherwise, any other publication approved for the purpose by the Authority.

"Authorized Officer" means: (i) in the case of the Authority, the Chairman, Vice-Chairman, or Executive Director, and when used with reference to any act or document also means any other person

authorized by resolution of the Authority to perform such act or execute such document; (ii) in the case of the Institution, the person or persons authorized by resolution of the Institution to perform any act or execute any document; and (iii) in the case of the Trustee, means the President, any Vice President, any Corporate Trust Officer, any Trust Officer or any Assistant Trust Officer of the Trustee, and when used with reference to any act or document also means any other person authorized to perform any act or sign any document by or pursuant to a resolution of the Board of Directors of the Trustee.

"Bond" or "Bonds" means any of the bonds of the Authority authorized by this Resolution and issued pursuant to a Series Resolution.

"Bond Counsel" means a law firm having a national reputation in the field of municipal law whose opinions are generally accepted by purchasers of municipal bonds, appointed by the Authority.

"Bondholder" or the term "holder" or any similar term when used with reference to a Bond or Bonds, means any person who shall be the holder of any Bond or Outstanding Bond registered to bearer or not registered, or the registered owner of any Bond or Outstanding Bond which shall at the time be registered other than to bearer.

"Bond Year" or "Lease Year", as the case may be, unless as otherwise stated in the Applicable Series Resolution, means a period of twelve (12) consecutive months beginning on July 1 in any calendar year and ending on June 30 of the succeeding calendar year.

"Construction Fund" means each such fund so designated which shall be established for the Applicable Series Resolution pursuant to Section 5.01.

"Construction and Acquisition Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Debt Service Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Debt Service Reserve Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Debt Service Reserve Fund Requirement," unless otherwise stated in the Applicable Series Resolution, means, as of any particular date of computation, an amount of money equal to the greatest amount required in the then current or any future Bond Year to pay the sum of: (i) interest on the Bonds of a Series payable on January 1 of such Bond Year and on July 1 of the next succeeding Bond Year; and (ii) the principal of the Bonds of a Series payable on July 1 of the next succeeding Bond Year.

"Initial Administrative Fee" means the fee for the initial services of the Authority in regard to a Project in the amount stated or defined in the Applicable Series Resolution.

"Institution" means a Participating Institution or a Primary Institution, both as defined in the Act, designated or defined in the Applicable Series Resolution.

"Interest Account" means each such account so designated which shall be established in each Debt Service Fund for each Applicable Series Resolution pursuant to Section 5.01.

"Lease" means either the Lease or Lease and Agreement executed by and between the Authority and an Institution, relating to the Project described or defined in the Applicable Series Resolution.

"Operating Expenses" means, in the event that for any reason the Authority shall re-enter a Project, expenses incurred by the Authority for operation and maintenance of such Project by the Authority and shall include administrative expenses, insurance premiums, auditing and legal expenses and any other expenses incurred by the Authority under the provisions of the Resolution, Applicable Series Resolution, Agreement, Lease and the expenses and compensation of the Trustee, all to the extent properly attributable to such Project.

"Operating Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Outstanding," when used in reference to Bonds, means as of a particular date, all Bonds authenticated and delivered under the Resolution and the Applicable Series Resolution except: (i) any Bonds cancelled by the Trustee at or before such date; (ii) any Bonds for the payment or redemption of which the necessary amount or investment obligations permitted under Section 5.12, the principal of and interest on which, when due and payable, will provide such necessary amount, shall have been or shall concurrently be deposited with the Trustee; provided that, if such Bonds are being redeemed prior to maturity, the required notice of redemption shall have been given or irrevocable provisions for the giving thereof shall have been

made with the Trustee; and (iii) any Bonds in lieu of or in substitution for which other Bonds shall have been authenticated and delivered pursuant to Article II or Section 11.05.

"Paying Agent" means a bank or trust company appointed as Paying Agent for a Series of Bonds pursuant to the Applicable Series Resolution and its successor or successors.

"Principal Account" means each such account so designated which shall be established in each Debt Service Fund for each Applicable Series Resolution pursuant to Section 5.01.

"Project" means a facility or facilities to be constructed or acquired by the Authority pursuant to the Act which may include more than one part as more particularly described or defined in the Applicable Series Resolution and shall include, unless otherwise provided, site acquisition, site improvement, construction, equipment, furniture and utilities.

"Project Acquisition Fund" means each such fund so designated which shall be established for the Applicable Series Resolution pursuant to Section 5.01.

"Redemption Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Redemption Price," when used with respect to a Bond, means the principal amount of such Bond plus the applicable premium, if any, payable upon redemption thereof pursuant to the Resolution and Applicable Series Resolution.

"Renewal and Replacement Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Renewal and Replacement Fund Requirement" means the amount to be stated or defined as such requirement by the Applicable Series Resolution.

"Resolution" means this General Bond Resolution as the same may from time to time be amended or supplemented by a Supplemental Resolution or Resolutions.

The term "resolution of the Authority" means a resolution, other than this Resolution, a Series Resolution or a Supplemental Resolution, duly adopted by the Authority.

"Revenues" mean all rents, fees, charges, rates, and other income and receipts derived by or payable to the Authority or to the Trustee for the account of the Authority in respect of the Project as specified and described in the Applicable Series Resolution excluding the Annual Administrative Fee, the Initial Administrative Fee and reimbursements to the Authority for expenses incurred by the Authority for such Project.

"Revenue Fund" means each such fund so designated which shall be established for each Applicable Series Resolution pursuant to Section 5.01.

"Series of Bonds" or "Bonds of a Series" means the Series of Bonds authorized by the Applicable Series Resolution.

"Series Resolution" means a resolution of the Authority authorizing the issue of a Series of Bonds adopted by the Authority pursuant to Article IX.

"Sinking Fund Account" means each account so designated which may be established in each Debt Service Fund by each Applicable Series Resolution pursuant to Section 5.01.

"Sinking Fund Installment" means the amount of money sufficient to redeem Bonds at 100% of the principal amount thereof in the amounts, at the times and in the manner set forth in a Series Resolution.

"Sinking Fund Installment Payment Date" means the date of payment of a Sinking Fund Installment as specified in the Applicable Series Resolution.

"State Bond Commission" means the State Bond Commission of the State of Louisiana created pursuant to the provisions of Act 26 of the First Extraordinary Session of the Legislature of Louisiana for the year 1968, or any successor thereto.

"Supplemental Resolution" means any resolution of the Authority amending or supplementing this Resolution, any Series Resolution of the Bonds, adopted and becoming effective in accordance with the terms of this Resolution.

"Trustee" means the bank or trust company appointed as Trustee for a Series of Bonds pursuant to the Applicable Series Resolution and its successor or successors.

Section 1.02. Construction of Certain Words and Terms. Words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders. Unless the context

shall otherwise indicate, the words "bond," "coupon," "owner," "holder" and "person" shall include the plural as well as the singular number and the word "person" shall include corporations and associations, including public bodies, as well as natural persons.

Section 1.03. Resolution, the Applicable Series Resolution and Bonds Constitute a Contract. With respect to each Series of Bonds in consideration of the purchase and acceptance of the Bonds of a Series authorized to be issued under this Resolution and the Applicable Series Resolution by those who shall hold the same from time to time; (i) this Resolution and the Applicable Series Resolution shall constitute a contract between the Authority, the Trustee and the holders from time to time of such Bonds of a Series and coupons relating thereto; (ii) the pledge made herein and the covenants and agreements set forth to be performed by or on behalf of the Authority shall be for the equal and ratable benefit, protection and security of the holders of such Bonds of a Series and coupons relating thereto, all of which, regardless of the time or times of their issue or maturity, shall be of equal rank without preference, priority or distinction of any of such Bonds of a Series or coupons relating thereto over any other thereof except as expressly provided in or permitted hereby or by the Applicable Series Resolution; (iii) the Authority does hereby pledge and assign to the Trustee the Revenues and all income and receipts earned on funds held by the Trustee under the Resolution and the Applicable Series Resolution as security for the payment of the Series of Bonds to which the Applicable Series Resolution relates and the interest thereon and as security for the performance of any other obligation of the Authority under the Resolution and Applicable Series Resolution all in accordance with the provisions thereof and hereof; (iv) the pledge made hereby is valid and binding from the time when the pledge is made and the Revenues and all income and receipts earned on funds held by the Trustee hereunder and under the Applicable Series Resolution shall immediately be subject to the lien of such pledge without any physical delivery thereof or further act, and the lien of such pledge shall be valid and binding as against all parties having claims of any kind in tort, contract or otherwise against the Authority irrespective of whether such parties have notice thereof; and (v) the Bonds of a Series shall be special obligations of the Authority payable from and secured by a pledge of the Revenues as provided hereby and by the Applicable Series Resolution.

## ARTICLE II

### AUTHORIZATION AND ISSUANCE OF BONDS

Section 2.01. Authorization of Bonds. There are hereby authorized Bonds of the Authority to be issued as hereinafter provided, and there is hereby created a continuing pledge and lien as provided hereby to secure the full and final payment of the principal or Redemption Price of and interest on all Bonds. The aggregate principal amount of the Bonds of a Series which may be executed, authenticated and delivered is not limited except as provided by the Applicable Series Resolution. Bonds may be issued for any purpose authorized by the Act, including construction or acquisition of a Project or refunding or an indebtedness incurred therefor.

Section 2.02. Provisions for Issuance of Bonds; Series Resolution. The issue of Bonds of a Series shall be authorized by a Series Resolution or Series Resolutions adopted pursuant to Article IX.

Each Series Resolution shall specify:

- (1) The authorized principal amount of such Series of Bonds;
- (2) The purpose or purposes and the name or names of the Institution or Institutions for which such Series of Bonds is being issued;
- (3) The date, maturity dates and amounts of each maturity and the first and subsequent interest payment dates of the Bonds of such Series;
- (4) The interest rate or rates of the Bonds of such Series, or the manner of determining such rate or rates;
- (5) The denomination or denominations of and the manner of numbering and lettering the Bonds of such Series;
- (6) If any of the Bonds of such Series are issued in the form customarily known as "term Bonds," the amount and due dates of each Sinking Fund Installment payment for the Bonds of such Series, the date or dates and redemption price or prices upon which the Bonds may be redeemed from such

installments, and the manner and procedure of applying such Sinking Fund Installments to the redemption of such Bonds;

- (7) The Trustee or the manner of appointing such Trustee for the Bonds of such Series;
- (8) The Paying Agent or Paying Agents, or the manner of appointing such Paying Agent or Paying Agents;
- (9) The Redemption Price or Redemption Prices, if any, and, subject to Article III, the redemption terms, if any, for the Bonds of such Series;
- (10) Provisions for the sale of the Bonds of such Series;
- (11) Directions for the application of the proceeds of the Bonds of a Series as provided in Article V;
- (12) A statement of the amount of insurance to be provided in a blanket insurance policy or policies as permitted by Section 6.08 or in lieu thereof a different covenant of the Authority as to insurance in substitution for Section 6.08; and
- (13) Any other provisions deemed advisable by the Authority, which may include variations of this Resolution with respect to the Bonds to be issued under the Series Resolution and the Project financed thereunder.

**Section 2.03. Refunding Bonds.** In accordance with Section 8(E) of the Act, (R.S. 17:3035(E)), the Authority may issue refunding bonds to refund any one or more Series of Outstanding Bonds. Refunding bonds shall be issued pursuant to and in accordance with the provisions of a Series Resolution authorizing such refunding bonds.

**Section 2.04. Authorization of Additional Bonds.** In addition to any Series of Bonds initially issued for a Project, the Authority may issue additional Bonds by a Series Resolution to complete such Project and to provide additional funds for the Debt Service Reserve Fund for such Project, which additional Bonds shall thereafter be entitled to the pledge of the Revenues made by the Resolution and the Applicable Series Resolution on a parity with the Series of Bonds initially issued for such Project and for the purposes of Article V, Section 7.09, Article VII and Section 12.03 shall be deemed part of the same series. Such Series Resolution shall state the amount of the proceeds of such additional Bonds required to be paid to such Debt Service Reserve Fund to make the amount on deposit in such Fund equal to the Debt Service Reserve Fund Requirement after such additional Bonds have been issued.

Where any Bonds issued with respect to a Project are to be redeemed, the Bonds then subject to redemption, whether originally issued for the Project or issued as additional Bonds under this Section, shall be considered to be of a single issue for the purposes of determining any priority of redemption.

**Section 2.05. Place and Medium of Payment.** The Bonds of a Series shall be payable as to principal or Redemption Price of and interest thereon in lawful money of the United States of America. The principal of Bonds, unless registered other than to bearer, and the interest thereon, unless registered as to principal and interest, shall be payable at the principal office of the Trustee and, at the option of the holder, at the principal office of the Paying Agent or Paying Agents designated by the Applicable Series Resolution.

Payment of the principal of Bonds registered as to principal only, or as to both principal and interest, upon presentation and surrender thereof at the principal office of the Trustee, shall be made to the person appearing on the registration books of the Authority provided for herein as the registered owner thereof. Payment of interest on Bonds registered as to both principal and interest shall be made by check or draft mailed to the registered owner at his address as shown on such registration books.

**Section 2.06. Denominations, Numbers and Legends.** The Bonds may contain, or have endorsed thereon, such provisions, specifications and descriptive words not inconsistent with the provisions hereof or of any Series Resolution authorizing the same, as may be necessary or desirable and as may be determined by the Authority prior to their authentication and delivery.

**Section 2.07. Execution and Authentication.** The Bonds shall be executed in the name and on behalf of the Authority by the manual or facsimile signature of its Chairman or Vice-Chairman and sealed with its corporate seal (or a facsimile thereof), attested by the manual or facsimile signature of its Secretary. In case any officer whose manual or facsimile signature appears on such Bonds or coupons shall cease to be such officer before delivery of such Bonds, such signature shall, nevertheless, be valid and sufficient for all purposes as if he had remained in office until such delivery. Coupons, if any, attached to such Bonds shall bear the facsimile signature of its Chairman or Vice-Chairman or Secretary and the Authority may, by resolution, adopt and use for that purpose the facsimile signature of any person who shall have been such

officer, notwithstanding the fact that he may not have been such officer on the date of such Bonds or that he may have ceased to be such officer at the time when such Bonds shall be actually authenticated and delivered. The Bonds when so executed shall be delivered to the Trustee for authentication by it, and the Trustee shall authenticate and deliver such Bonds as herein provided and not otherwise.

No Bond or any coupons appertaining thereto shall be valid or obligatory for any purpose or shall be entitled to any right or benefit hereunder unless there shall be endorsed on such Bond a certificate of authentication in the form set forth in Section 2.10, duly executed by the Trustee, and such certificate of the Trustee, upon any Bond executed on behalf of the Authority, shall be conclusive evidence and the only evidence required that the Bonds so authenticated have been duly issued hereunder and that the holder thereof is entitled to the benefit of this Resolution. The certificate of the Trustee may be executed by any Authorized Officer of the Trustee.

Except as otherwise provided in Sections 2.08 and 2.09, the Trustee, before authenticating and delivering any of the Bonds, shall detach, cancel and destroy all matured coupons thereto attached.

**Section 2.08 Registration and Conversion of Bonds.** Bonds may be registered, at the option of the holder, as to principal only or as to both principal and interest unless otherwise provided by the Applicable Series Resolution.

The Bonds shall be negotiable instruments for all purposes and shall be transferable by delivery unless registered in the manner hereinafter provided. The Authority shall cause to be prepared books for registration of the Bonds, which registration books shall be kept by the Trustee which is hereby designated "Registrar" for the purpose of registering the Bonds. The holder of any Bond may register or discharge from registration such Bond upon such books, and Bonds which have been registered as to both principal and interest may be reconverted to coupon bearer Bonds by the affixing of appropriate coupons for unpaid interest, all in the manner and upon the terms and conditions set forth under the heading "Provisions for Registration" appearing on the Bond.

The Authority shall not charge or permit to be charged to the Bondholder any fee for registration, conversion, or reconversion, provided, however, that the cost of preparing and affixing new coupons required in any conversion or reconversion shall be paid by the Bondholder requesting such conversion or reconversion.

The Authority and the Trustee may deem and treat the bearer of any Bond which shall not at the time be registered as to principal and the bearer of any coupon, whether the Bond to which such coupon appertains shall be registered as to principal or not, as the absolute owner of such Bond or coupon, as the case may be (whether or not such Bond or coupon shall be overdue and notwithstanding any notation of ownership or other writing thereon made by anyone other than the Authority or the Trustee), for the purpose of receiving payment thereof or on account thereof and for all other purposes, and neither the Authority nor the Trustee shall be affected by any notice to the contrary. The Authority and the Trustee may deem and treat the person in whose name any Bond registered either as to principal only or both principal and interest shall be registered as the absolute owner thereof (whether or not such Bond shall be overdue and notwithstanding any notation of ownership or other writing thereon made by anyone other than the Authority or the Trustee) for the purpose of receiving payment of or on account of the principal of such Bond, and for all other purposes except to receive payment of any interest represented by coupons appertaining to any such Bond registered as to principal only, and neither the Authority nor the Trustee shall be affected by any notice to the contrary. All such payments so made to any such bearer or registered owner, as the case may be, or upon his order shall be valid and, to the extent of the sum or sums so paid, effectual to satisfy and discharge the liability for moneys payable upon any such Bond or coupon.

**Section 2.09 Bonds Mutilated, Destroyed, Lost or Stolen.** In case any Bond shall become mutilated or be destroyed, lost or stolen, the Authority in its discretion may execute, and upon its request the Trustee shall authenticate and deliver, a new Bond of the same series and maturity (with coupons corresponding to the coupons, if any, appertaining to the mutilated, destroyed, lost or stolen Bond), bearing the same number as the mutilated, destroyed, lost or stolen Bonds, in exchange for the mutilated Bond and its coupons (if any), or in substitution for the Bond and its coupons (if any) so destroyed, lost or stolen. In case any coupon or coupons appertaining to any Bond shall become mutilated or be destroyed, lost or stolen, the Authority in its discretion may execute, and upon its request the Trustee shall authenticate and deliver, a new Bond of the same series and maturity (with coupons corresponding to the coupons appertaining to

such Bond) bearing the same number as such Bond, in exchange for such Bond and any coupons appertaining thereto which shall not be destroyed, lost or stolen, and in substitution for the coupons appertaining thereto which shall be mutilated, destroyed, lost or stolen. In every case of exchange or substitution, the applicant shall furnish to the Authority and to the Trustee such security or indemnity as may be required by them to save each of them harmless from all risks, however remote, and the applicant shall also furnish to the Authority and to the Trustee evidence to their satisfaction of the mutilation, destruction, loss or theft of the applicant's Bond (or coupon or coupons) and of the ownership thereof. The Trustee may authenticate any Bond issued upon such exchange or substitution and deliver the same with the appurtenant coupons (if any), upon the written request or authorization of an Authorized Officer of the Authority. Upon the issue of any Bond upon such exchange or substitution, the Authority may require the payment of a sum sufficient to cover any tax or other governmental charge that may be imposed in relation thereto and any other expenses, including counsel fees, of the Authority or the Trustee. In case any Bond or any coupon which has matured or is about to mature shall become mutilated or be destroyed, lost or stolen, the Authority may, instead of issuing a Bond in exchange of substitution therefor, pay or authorize the payment of the same (without surrender thereof except in the case of a mutilated Bond or coupon) if the applicant for such payment shall furnish to the Authority and to the Trustee such security or indemnity as they may require to save them harmless and evidence to the satisfaction of the Authority and the Trustee of the mutilation, destruction, loss or theft of such Bond or coupon and of the ownership thereof.

Every Bond so issued in exchange or substitution for any Bond which (or any coupon appertaining to which) is destroyed, lost or stolen shall constitute an additional contractual obligation of the Authority, whether or not the destroyed, lost or stolen Bond or coupon or coupons shall be found at any time, or be enforceable by anyone, and shall be entitled to all the benefits hereof equally and proportionately with any and all other Bonds and coupons duly issued under this Resolution. All Bonds and coupons shall be held and owned upon the express condition that the foregoing provisions are exclusive with respect to the replacement or payment of mutilated, destroyed, lost or stolen Bonds and coupons, and shall preclude any and all other rights or remedies, notwithstanding any law existing or hereinafter enacted to the contrary with respect to the replacement or payment of negotiable instruments or other securities without their surrender.

Section 2.10. Form of Bonds and Coupons. The Bonds, the registration endorsement to appear on the reverse side thereof, the endorsement of the State Bond Commission, the coupons to be attached thereto, and the Trustee's certificate of authentication, shall be in substantially the form hereinafter set forth with such insertions, omissions or variations as may be necessary or appropriate or as may be permitted by the Resolution, Applicable Series Resolution or the Act.

(FORM OF BOND)  
UNITED STATES OF AMERICA  
STATE OF LOUISIANA

HEALTH EDUCATION AUTHORITY OF LOUISIANA  
REVENUE BOND

(Name of Institution) Issue, Series . . .

No. \$5,000

KNOW ALL MEN BY THESE PRESENTS that the Health Education Authority of Louisiana, a body politic and corporate and public instrumentality of the State of Louisiana (hereinafter called the "Authority"), for value received promises to pay (but only out of the Revenues described in the Resolution hereinafter mentioned) to the bearer, or if this Bond is registered, to the registered owner hereof, upon presentation and surrender hereof, in lawful money of the United States of America, the sum of

FIVE THOUSAND DOLLARS (\$5,000)

on the      day of      19      and to pay interest thereon (but only out of said Revenues)

from the date hereof at the rate of \_\_\_\_\_ per cent ( \_\_\_\_\_ %) per annum until the principal sum is paid, payable semiannually on the \_\_\_\_\_ days of \_\_\_\_\_ and \_\_\_\_\_ of each year. Payment of the interest on this Bond shall be made only upon presentation and surrender of the coupons hereto attached representing such interest as the same respectively fall due, or if this Bond shall be registered as to both principal and interest, to the registered owner. The principal of this Bond, unless registered other than to bearer, and the interest on this Bond, unless registered as to both principal and interest, are payable at the principal office of the Trustee, \_\_\_\_\_ or at the option of the holder,

at the principal office of \_\_\_\_\_

The principal of this Bond, while registered other than to bearer, is payable at the principal office of the Trustee. The interest on this Bond, while registered as to both principal and interest, is payable by check or draft mailed to the registered holder at his address as shown on the registration books.

This Bond is issued under the provisions of Act 112 of the Regular Session of the Legislature of Louisiana for the year 1968, as amended, which now appears as La. R.S. 17:3051 to R.S. 17:3060, inclusive (such Act, as amended, being hereinafter called the "Act"), and pursuant to the General Bond Resolution adopted by the Authority on March 8, 1974, and a Series Resolution adopted by the Authority on \_\_\_\_\_, 19\_\_\_\_ (both such resolutions hereinafter collectively called the "Resolution"). This Bond and the issue of which it is a part is a special obligation of the Authority payable solely from and secured solely by a pledge of, equally and ratably with all other Bonds of this issue and any additional bonds issued as permitted by the Resolution, the Revenues provided therefor pursuant to the Resolution. This Bond is one of an authorized series of Bonds of like designation herewith, aggregating \$ \_\_\_\_\_ in principal amount, issued to pay the cost of the Project defined in the Resolution and other purposes provided by the Resolution, to which Resolution reference is hereby made for a description of the Revenues assigned and pledged thereunder, the nature and extent of the security thereby created, and the rights, limitation of rights, obligations, duties and immunities of the Authority, the Trustee and the holders of the Bonds and coupons. Certified copies of the Resolution are on file in the office of the Trustee and in the office of the Authority.

The Resolution provides that additional bonds may be issued thereunder to complete the Project and to provide payment of additional funds to the Debt Service Reserve Fund created by the Resolution.

All Bonds of the issue of which this Bond is a part (except such Bonds maturing on or before \_\_\_\_\_, which are not subject to redemption prior to maturity) are redeemable prior to maturity beginning on or after \_\_\_\_\_, at the Authority or by operation of the Redemption Fund, as a whole at any time, or in part on any interest payment date, in inverse order of maturity (if less than all of the Bonds outstanding of any maturity shall be called for redemption, such bonds to be so redeemed shall be selected by the Trustee by lot in any customary manner of selection as determined by the Trustee), at the following prices expressed in percentages of their principal amount plus accrued interest to the redemption date:

Period During Which Redeemed	Redemption Price
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Notice of redemption having been published as required by the Resolution, the Bonds so called for redemption, on the date specified in such notice, shall become due and payable at the applicable Redemption Price herein provided, and, moneys for such redemption having been deposited with the Trustee, from and after the date so fixed for redemption interest on the Bonds so called for redemption shall cease to accrue.

In case an event of default, as defined in the Resolution, shall occur, the principal of this Bond may be declared due and payable in the manner and with the effect provided in the Resolution.

Neither the State of Louisiana nor the Authority shall be obligated to pay the principal of or interest on this Bond except from the revenues of the Project and neither the faith and credit nor the taxing power of the State of Louisiana or of any political subdivision thereof is pledged to the payment of the principal of or interest on this Bond.

No recourse shall be had for the payment of the principal of or interest on this Bond against any

member or other officer of the Authority, or any person executing this Bond, all such liability, if any, being hereby expressly waived and released by every holder or registered owner of this Bond by the acceptance hereof and as a part of the consideration hereof

The Resolution contains provisions permitting the Authority, with the consent of the holders of not less than 66 2/3% in aggregate principal amount of the Bonds outstanding, evidenced as in the Resolution provided, to adopt supplemental resolutions modifying any of the provisions of the Resolution or any supplemental resolution or of the Bonds or releasing the Authority from any of the obligations, covenants, agreements, limitations, conditions or restrictions therein contained, provided, however, that no such supplemental resolution shall (i) change any terms of redemption of Bonds, or the due date of principal or interest on Bonds or make any reduction in principal or redemption price of and interest on any Bond without the consent of the holder of each Bond so affected, or (ii) reduce the aforesaid percentage of Bonds, the consent of the holders of which is required for any such supplemental resolution, without the consent of the holders of all Bonds then outstanding

This Bond is a negotiable instrument for all purposes and shall be transferable by delivery unless registered as to principal other than to bearer. This Bond may be registered in the name of the holder as to principal only, or as to both principal and interest, in conformity with the provisions endorsed hereon

The Authority and the Trustee may treat the bearer hereof, or if registered as to principal, the registered holder hereof, and the bearer of any coupon appertaining hereto, whether or not this Bond shall be registered as to principal, as the absolute owner of this Bond or such coupon, as the case may be (whether or not this Bond shall be overdue and notwithstanding any notation of ownership or other writing hereon made by anyone other than the Authority or the Trustee), for the purpose of receiving payment of or on account of this Bond or such coupon and for all other purposes and neither the Authority nor the Trustee shall be affected by any notice to the contrary

It is hereby certified and recited by the Authority that all acts, conditions and things necessary to be done, precedent to and in the issue of the Bonds of the issue of which this Bond is a part in order to make them the legal, valid and binding obligations of the Authority in accordance with their terms, have been done, have happened and have been performed in regular and due form as required by law, and that the issue of such Bonds does not exceed or violate any constitutional, statutory or other limitation upon the amount of the bonded indebtedness prescribed by law for the Authority

Neither this Bond nor any of the annexed coupons shall be valid until the certificate of authentication hereon shall have been signed by the Trustee

IN WITNESS WHEREOF, the Health Education Authority of Louisiana has caused this Bond to be executed in its name by the manual or facsimile signature of the Chairman or Vice-Chairman of its Board of Trustees and its corporate seal (or a facsimile thereof) to be hereunto affixed, imprinted, engraved or otherwise reproduced and attested by the manual or facsimile signature of the Secretary of said Board of Trustees and coupons for interest bearing the facsimile signature of said Secretary to be hereunto attached, all as of the            day of            19           

HEALTH EDUCATION AUTHORITY OF LOUISIANA

By \_\_\_\_\_  
(Vice) Chairman  
Board of Trustees

ATTEST \_\_\_\_\_  
Secretary  
Board of Trustees

(FORM OF COUPON)

On the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_ (unless the Bond to which this coupon is attached shall have theretofore been duly called for previous redemption, and payment of the redemption price duly made or provided for), the Health Education Authority of Louisiana will pay to bearer, but only out of the Revenues referred to in the Bond, upon surrender of this coupon at the principal office of \_\_\_\_\_ the amount specified hereon in lawful money of the United States of America, being \_\_\_\_\_ months' interest then due on its Revenue Bond, \_\_\_\_\_ Issue, Series \_\_\_\_\_, dated as of the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

No. \_\_\_\_\_

HEALTH EDUCATION AUTHORITY OF LOUISIANA

\_\_\_\_\_  
Secretary  
Board of Trustees

TRUSTEE'S AUTHENTICATION CERTIFICATE

This Bond is one of the Bonds described in the within mentioned General Bond Resolution and Series Resolution of the Health Education Authority of Louisiana.

\_\_\_\_\_, TRUSTEE

By \_\_\_\_\_  
Authorized Officer

PROVISIONS FOR REGISTRATION

This Bond may be registered as to principal only in the name of the owner on the books kept by the Trustee as Registrar, such registration being noted hereon by such Registrar in the registration blank below, after which no transfer shall be valid unless made on such books by the registered owner or attorney duly authorized and similarly noted in the registration blank below; but it may be discharged from registration by being transferred to bearer, after which it shall be transferable by delivery, but it may be again registered as before. The registration of this Bond as to principal shall not restrain negotiability of the coupons by delivery merely, but all unmatured coupons may be surrendered to the Trustee and the interest represented thereby made payable only to the registered owner in which event the Registrar shall note in the registration blank below that the Bond is registered as to interest as well as to principal. At the request of the registered owner, this Bond, when converted into a Bond registered as to both principal and interest, may be reconverted into a coupon Bond at the expense of the owner and again converted into a Bond registered as to both principal and interest, as hereinabove provided. Upon reconversion of this Bond, when registered as to principal and interest, into a coupon Bond, coupons representing the interest payable on this Bond to date of maturity shall be attached thereto by the Registrar and the Registrar shall note in the registration blank below whether the Bond is registered as to principal only or payable to bearer. Registrations and transfers may be suspended by the Registrar for not exceeding ten days prior to any payment date.

Date of Registration	In Whose Name	Manner of Registration	Signature of Registrar
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

(FORM OF ENDORSEMENT BY STATE BOND COMMISSION  
TO BE PRINTED ON THE BOND PANEL)

"The Bond sold by the State Bond Commission on behalf of the Health Education Authority of Louisiana in accordance with the requirements of Act 26 of the First Extraordinary Session of the Legislature of Louisiana for the year 1968 "

STATE TREASURER

Section 2 11 Issuance and Delivery of Bonds Bonds may be executed by the Authority and delivered to the Trustee for authentication, and upon compliance by the Authority with the requirements of Section 2.12 and such other requirements as may be set forth in the Applicable Series Resolution, the Trustee shall thereupon authenticate and deliver such Bonds upon the order of the Authority

Section 2 12 Conditions Precedent to Delivery of Bonds The Trustee shall authenticate and deliver upon the order of the Authority any of the Bonds authorized to be issued pursuant to this Resolution and a Series Resolution which bear an endorsement executed by the Treasurer of the State of Louisiana evidencing the sale thereof by the State Bond Commission as required by R S 39 1403 (as the same now exists or may be amended or supplemented in the future) and upon delivery to the Trustee of

- (a) A copy of the Resolution and the Applicable Series Resolution, each certified by an Authorized Officer of the Authority,
- (b) The written order of the Authority as to the delivery of such Bonds, signed by an Authorized Officer, describing the Bonds to be authenticated and delivered, designating the purchaser or purchasers to whom such Bonds are to be delivered, and stating the purchase price of such Bonds
- (c) An opinion of Bond Counsel stating in the opinion of such firm that the Resolution and the Applicable Series Resolution authorizing the Series of Bonds have been duly and lawfully adopted by the Authority that the Resolution and the Applicable Series Resolution are in full force and effect and are valid and binding upon the Authority and enforceable in accordance with their terms, and that the Authority is duly authorized to issue such Series of Bonds and, upon the execution, authentication and delivery thereof, such Series of Bonds will be duly and validly issued and will constitute valid and binding special obligations of the Authority entitled to the benefits of the Resolution and such Applicable Series Resolution

Section 2 13 Temporary Bonds Pending preparation of definitive Bonds of any Series, or by agreement with the purchasers of all Bonds of any Series, the Authority may issue and, upon its request, the Trustee shall authenticate in lieu of definitive Bonds one or more temporary printed or typewritten Bonds of substantially the tenor recited above but in fully registered form without interest coupons Upon request of the Authority the Trustee shall authenticate definitive Bonds in exchange or and upon surrender of an equal principal amount of temporary Bonds Until so exchanged, temporary Bonds shall have the same rights, remedies and security hereunder as definitive Bonds

Section 2 14 Cancellation and Destruction of Surrendered Bonds Bonds and coupons surrendered for payment, redemption or exchange and Bonds purchased from any Fund established under the Resolution shall be cancelled and destroyed by the Trustee The Trustee shall deliver to the Authority a certificate of destruction in respect of all Bonds and coupons so destroyed

ARTICLE III

REDEMPTION OF BONDS

Section 3 01 Authorization of Redemption Bonds may be subject to redemption prior to maturity in accordance with this Article III, at such times at such Redemption Prices and upon such terms as may be specified in the Applicable Series Resolution

Section 3 02 Authority's Election to Redeem In addition to the redemption of Bonds by operation of the Redemption Fund, Bonds may be redeemed at the option of the Authority In exercising such option,

the Authority shall give written notice to the Trustee of its election to redeem and of the principal amount of the Bonds to be redeemed, which notice shall be at least sixty (60) days prior to the next date fixed for redemption, or such lesser number of days as shall be acceptable to the Trustee. In the event notice of redemption shall have been published as provided in Section 3.03, the Authority shall, prior to the date fixed for redemption, pay to the Trustee an amount in cash which, in addition to other moneys, if any, available therefor held by the Trustee, shall be sufficient to redeem at the Redemption Price thereof, plus accrued interest to the date fixed for redemption, all of the Bonds the Authority has so elected to redeem.

**Section 3.03 Notice of Redemption.** When Bonds are to be redeemed by operation of the Redemption Fund or as provided in Section 3.02, the Trustee shall give notice of the redemption of the Bonds in the name of the Authority which notice shall specify, (i) the Bonds to be redeemed, (ii) the date fixed for redemption, (iii) the numbers and other distinguishing marks of the Bonds to be redeemed (except in the event that all of the Outstanding Bonds are to be redeemed), and (iv) that such Bonds will be redeemed at the principal office of the Trustee. Such notice shall further state that on such date there shall become due and payable upon each Bond to be redeemed the Redemption Price thereof, together with interest accrued to the redemption date, and that moneys therefor having been deposited with the Trustee, from and after such date interest thereon shall cease to accrue. Such notice shall be given by publication once in an Authorized Newspaper, such publication to be not less than thirty (30) days prior to the redemption date. The Trustee shall also mail a copy of such notice, postage prepaid, not less than thirty (30) days prior to the date fixed for redemption, to the registered owners of any Bonds which are to be redeemed, at their last known addresses, if any, appearing on the registration books, but such mailing shall not be a condition precedent to such redemption, and failure to do so mail any such notice to any of such registered owners shall not affect the validity of the proceedings for the redemption of the Bonds.

**Section 3.04 Payment of Redeemed Bonds.** Notice having been given by publication in the manner provided in Section 3.03, the Bonds so called for redemption shall become due and payable on the redemption date so designated at the Redemption Price, plus accrued interest to the date fixed for redemption, upon presentation and surrender thereof at the office specified in such notice, together with, in the case of coupon Bonds, all appurtenant coupons maturing on or subsequent to the date fixed for redemption. All interest installments represented by coupons which shall have matured on or prior to the date fixed for redemption shall continue to be payable to the bearer of such coupons. If, on the date fixed for redemption, moneys for the redemption of all Bonds to be redeemed, together with interest to the date fixed for redemption, shall be held by the Trustee so as to be available therefor on such date, and after notice of redemption shall have been published as aforesaid, then, from and after the date fixed for redemption, the Bonds so called for redemption shall cease to bear interest and the coupons for interest appertaining thereto maturing subsequent to the date fixed for redemption shall be void and such Bonds and coupons shall no longer be considered as Outstanding hereunder. If such moneys shall not be so available on the date fixed for redemption, the principal of such Bonds shall continue to bear interest until paid at the same rate as they would have borne had they not been called for redemption provided however, the redemption premium shall not bear interest. In such event, both the principal and redemption premium shall be payable from the sources provided hereby for the payment of principal and the redemption premium shall be treated as principal for the purposes of Section 7.04 and for the purposes of determining the amounts required to be deposited in or transferred to the funds and accounts established hereby.

#### ARTICLE IV

#### CONSTRUCTION OF PROJECTS BY AUTHORITY

Unless or except as otherwise provided by the Applicable Series Resolution, the provisions of this Article shall apply to each Project constructed by the Authority and financed by a Series of Bonds issued under this Resolution.

**Section 4.01 Plans and Specifications, Construction Contracts.** The Authority shall cause plans and specifications to be prepared for each Project. Upon approval of such plans and specifications by the Authority and the Institution, the Authority shall proceed to award a construction contract or contracts

for the construction of the project with a responsible contractor or contractors licensed to do business in the State of Louisiana and cause the same to be constructed and completed pursuant thereto

**Section 4.02 Contractor's and Bid Bonds.** The Authority will obtain, or cause to be obtained, from the aforesaid contractor or contractors a bond or bonds covering (1) performance of the contract, including coverage for defects developing within one year after completion and acceptance, and (2) payment for labor and materials. The bond or bonds shall be executed by a responsible surety company qualified to do business in Louisiana and shall in each case be in an amount not less than 100% of the contract price, provided, that the one year maintenance portion of the bond or bonds may be limited to 10% of the contract price. The net amounts recovered on such bonds or on any bonds or deposits delivered in connection with competitive bids of contractors or underwriters in connection with any project shall be deposited in the Construction Fund.

**Section 4.03 Performance by Authority under Construction Contracts.** The Authority will faithfully perform, or cause to be performed, all agreements to be performed under construction contracts and will not do or refrain from doing any act whereby any surety on any bond may be released in whole or in part from any obligation assumed by it or from any agreement to be performed by it under the bond.

**Section 4.04 Builder's Risk, Liability and Workmen's Compensation Insurance.** The Authority will maintain, or cause to be maintained, builder's risk (or equivalent coverage) insurance upon any work done or materials furnished under construction contracts except excavations, foundations and any other structures not customarily covered by such insurance. The policies shall be issued by responsible companies qualified to do business in Louisiana and satisfactory to the Authority and shall be written in completed value form for 100% of the insurable value of the contract in the names of the Authority and/or the Institution and the contractor as their interests may appear. Any amounts payable to the Authority or the Institution thereunder shall be deposited in the Construction Fund, and the Authority will require the Institution to deposit any proceeds of such insurance received by it in the Construction Fund.

The Authority will also maintain, or cause to be maintained, workmen's compensation insurance covering all employees of contractors and subcontractors in amounts required by law, and public liability and property damage insurance in amounts of not less than \$500,000 for injuries to any one person (with an aggregate limitation for any one accident of not less than \$2,000,000) and \$200,000 for property damage (with an aggregate property damage limitation of not less than \$500,000), including contractual liability endorsement.

Each policy of insurance required by this Section or a copy thereof or insurance certificate in respect thereof, shall be deposited with the Trustee before commencement of the construction to which it relates.

## ARTICLE V

### FUNDS, ACCOUNTS, REVENUES AND APPLICATION THEREOF

#### Section 5.01 Establishment of Funds and Accounts

A. With respect to each Series of Bonds, unless otherwise provided by the Applicable Series Resolution, the following funds and separate accounts within funds shall be established, held and maintained for each Series of Bonds by the Trustee under the Applicable Series Resolution, except the Operating Fund, which shall be established, held and maintained by the Authority:

- Revenue Fund
- Operating Fund,
- Debt Service Fund
  - Interest Account,
  - Principal Account,
  - Sinking Fund Account,
- Debt Service Reserve Fund,
- Renewal and Replacement Fund,
- Redemption Fund

B. Unless otherwise provided by the Applicable Series Resolution there shall also be established for each Series of Bonds one of the following funds:

- (1) A Construction Fund in the case of a Project being constructed by the Authority
- (2) A Construction and Acquisition Fund in the case of a Project, a part of which is being constructed by the Authority and the remainder of which is being acquired by purchase
- (3) A Project Acquisition Fund in the case of a Project being acquired by the Authority through purchase

The fund so created pursuant to the provisions of this paragraph B shall, unless otherwise provided by the Series Resolution, be established, held and maintained by the Trustee

Hereinafter in this Resolution whenever the term 'Construction Fund' is used, it shall be deemed to mean and include either a Construction Fund, a Construction and Acquisition Fund or a Project Acquisition Fund

Each Applicable Series Resolution may contain provisions with respect to funds and accounts, and revenues and application thereof, which are in addition to or in lieu of provisions of this Article V

**Section 5.02 Application of Bond Proceeds and Allocation Thereof** Upon the receipt of the proceeds of a Series of Bonds, such proceeds shall be applied as provided in the Applicable Series Resolution.

**Section 5.03 Application of Moneys in the Construction Fund** All moneys deposited in the Construction Fund shall be held by the Trustee in trust subject to the provisions of this Resolution and the Applicable Series Resolution, shall be applied as hereinafter provided and, pending such application, shall be subject to a lien and charge in favor of the holders of the Bonds issued and outstanding under the Applicable Series Resolution and for the further security of such holders until paid out or transferred as herein provided

- (a) As soon as practicable after the delivery of each Series of Bonds, the Trustee shall pay from the Construction Fund established for such Series of Bonds to the persons entitled thereto the legal, administrative, financing and incidental expenses of the Authority relating to the issue of such Series of Bonds and shall pay the Initial Administrative Fee from such Fund to the Authority
- (b) Except as otherwise provided in this Article V and the Applicable Series Resolution, any moneys deposited in such Construction Fund shall be used only to pay the costs of or relating to the Project to which the Applicable Series Resolution relates
- (c) Except as otherwise provided in paragraph (d) hereof, payments pursuant to paragraphs (a) or (b) of this Section shall be made by the Trustee following the receipt by it of a requisition or requisitions signed by an Authorized Officer of the Authority stating the name of the payee, the purpose of each payment in terms sufficient for identification and the respective amounts of each such payment. With respect to any requisition for payment for work, labor and services performed or materials, equipment or supplies delivered for storage or fabrication, such requisition shall be accompanied by a certificate of the Architect stating that such work, labor or services were actually performed or such materials, equipment or supplies were actually used or installed in furtherance of the construction and equipping of the Project or delivered at the Site for that purpose or delivered for storage or fabrication at a place or places approved by said Architect or that such obligation was incurred as a progress payment due on equipment being fabricated to order
- (d) In the event that a Project is to be acquired by purchase from an Institution, the following provisions shall be applicable with respect to payment of items from the moneys credited to the Construction Fund in lieu of the provisions set forth in subsection (c) of this Section: Payment of the items of cost described in paragraphs (a) and (b) of this Section shall be made by the Trustee following receipt by it of a requisition signed by an Authorized Officer of the Institution and approval of such requisition by the Authority in the manner set forth in the Series Resolution. Such requisition shall state with respect to each payment to be made: (i) the name and address of the person to whom payment is to be made, (ii) the amount to be paid, (iii) that there has been expended (including allocations of expenditures) prior to the delivery of such requisition an amount on account of costs of the Project at least equal to the amount of the payment requested, and (iv) that no other requisition in respect of such expenditures is being or has previously been delivered to the Trustee
- (e) Upon completion of each Project, the Authority shall deliver to the Trustee a certificate signed by an Authorized Officer of the Authority certifying the balance of moneys then remaining in the

Construction Fund for such Project not needed to pay costs of the Project. The Trustee shall apply the balance, to the extent available, as follows and in the following order of priority:

FIRST to the Debt Service Reserve Fund for such Project, such amount as shall be necessary to make the amount on deposit in such Fund after such payment equal to the Debt Service Reserve Fund Requirement;

SECOND to the Renewal and Replacement Fund for such Project, such amount as shall be necessary to make the amount on deposit in such Fund after such payment equal to the Renewal and Replacement Fund Requirement, and

THIRD to the Redemption Fund for such Project, any balance remaining after making the payments required in subparagraphs FIRST and SECOND above.

Completion of each part (as specified in the definition of Project) of a Project shall be determined by a certificate signed by the Architect and delivered within thirty (30) days after the date of completion to the Authority, the Trustee and the Institution. Each such certificate shall state that such part of a Project has been completed, describe it in terms sufficient for identification, and specify the date of completion. In the case of the acquisition of a Project or any part thereof, completion of such acquisition shall be evidenced by a certificate signed by an Authorized Officer of the Authority and delivered within thirty (30) days after the date of completion of such acquisition to the Trustee. Each Project shall be determined to be completed when a certificate has been so delivered as to each such part of such Project, accompanied in the case of the last part by a certificate signed by an Authorized Officer of the Institution and the Authority stating that the Project has been completed and stating the amount of costs of the Project remaining to be paid from the Construction Fund.

Section 5.04. Payments by Institution to Trustee and Allocation Thereof. The Authority shall provide in each Applicable Series Resolution and the Agreement or Lease for the payments to be made by the Institution to the Trustee and for the deposit thereof in the funds and accounts established thereunder.

Section 5.05. Deposit of Revenues and Allocation Thereof. The Revenues received pursuant to each Agreement or Lease and any other moneys, which by any of the provisions of the Resolution and the Applicable Series Resolution are required to be deposited in the Revenue Fund, shall be promptly paid over or caused to be paid over by the Authority to the Trustee for deposit to the credit of such Revenue Fund.

Moneys deposited in the Revenue Fund shall be paid by the Trustee to the funds and accounts specified in the Applicable Series Resolution at the times, in the amounts and in the order of priority specified in such Applicable Series Resolution.

Section 5.06. Deposit of Revenues and Allocation Thereof Other Than Under Section 5.05. Notwithstanding the provisions of Section 5.05, in the event that for any reason the Authority shall re-enter a Project, the Revenues received from such Project by the Authority during each calendar month shall be paid over by the Authority to the Trustee as soon as practicable for deposit to the credit of the Revenue Fund for such Project. Moneys so deposited in such Revenue Fund shall be paid by the Trustee on or prior to the 10th business day after deposit thereof as follows and in the following order of priority:

FIRST: To the Authority, for deposit in the Operating Fund for such Project, the sum certified as sufficient to cover Operating Expenses for such Project until the Authority shall have adopted a budget of Operating Expenses for such Project, as required by Section 6.10, but only upon receipt by the Trustee from the Authority of a certificate signed by an Authorized Officer of the Authority stating that the Authority has re-entered such Project and certifying the amount sufficient to cover Operating Expenses until the Authority shall have adopted a budget of Operating Expenses as required by Section 6.10; and thereafter to the Authority for deposit in the Operating Fund the amount stated in such budget of Operating Expenses applicable to the month in which payment is made by the Trustee;

SECOND: To the Debt Service Fund for such Project to be credited to the Interest Account, an amount equal to one-sixth of the interest becoming due on the Series of Bonds for such Project on the next succeeding semi-annual interest payment date of such Bonds, except to the extent that an amount representing such interest is on deposit in such Fund;

THIRD: To the Debt Service Fund for such Project to be credited to the Principal Account and/or the Sinking Fund Account, an amount equal to one-twelfth of the principal amount or Sinking Fund Installment becoming due on the Series of Bonds for such Project on the next succeeding annual maturity date or Sinking Fund Installment Payment Date of such Bonds.

**FOURTH:** To the Debt Service Reserve Fund for such Project, the amount, if any, necessary to make the amount on deposit therein equal to the Debt Service Reserve Fund Requirement, and

**FIFTH:** To the Renewal and Replacement Fund for such Project, the amount, if any, necessary to make the amount on deposit therein equal to the Renewal and Replacement Fund Requirement.

Any balance remaining in the Revenue Fund for such Project at the expiration of any month when this Section is in effect shall be retained in such Revenue Fund for use in making the payments hereinabove set forth in the succeeding months.

**Section 5 07 Application of Moneys in the Debt Service Fund** The Trustee shall on each interest payment date pay or cause to be paid out of the Interest Account for a Series of Bonds the interest due on such Series of Bonds. The Trustee shall also pay out of such Interest Account any amounts required for the payment of accrued interest upon any redemption or purchase of Bonds of a Series for which such Interest Account has been established.

The Trustee shall on each principal payment date or Sinking Fund Installment Payment Date, as the case may be, pay or cause to be paid out of the Principal Account for a Series of Bonds the principal amount due or out of the Sinking Fund Account for a Series of Bonds, the Sinking Fund Installment payable on such Series of Bonds.

**Section 5 08 Application of Moneys in the Debt Service Reserve Fund.** If on any interest payment date the amount in the Interest Account for a Series of Bonds shall be less than the amount of interest then due on the Series of Bonds for which such Interest Account has been established or if on any principal payment date or Sinking Fund Installment Payment Date the amount in the Principal Account or Sinking Fund Account, as the case may be, for such Series of Bonds shall be less than the amount of principal then due or Sinking Fund Installment payable on the Series of Bonds for which such Principal Account or Sinking Fund Account has been established, the Trustee forthwith shall transfer moneys from the Debt Service Reserve Fund for such Series of Bonds, first, to the Interest Account, and second, to the Principal Account or Sinking Fund Account, as the case may be, to the extent necessary to make good the deficiency or deficiencies, as the case may be.

**Section 5 09 Application of Moneys in the Renewal and Replacement Fund.**

(a) If the Trustee at any time shall compute the value of the assets of the Debt Service Reserve Fund for a Series of Bonds and such computation discloses that the amount in such Debt Service Reserve Fund is less than the Debt Service Reserve Fund Requirement for such Series of Bonds and such deficiency cannot be remedied by transfer of moneys from the Redemption Fund for such Series of Bonds pursuant to Section 5.10, the Trustee shall transfer from moneys in the Renewal and Replacement Fund for such Series of Bonds to the Debt Service Reserve Fund for such Series of Bonds the amount necessary to maintain the Debt Service Reserve Fund Requirement for such Series of Bonds, and the Trustee shall notify the Authority and the Institution of such transfer and the amount thereof.

(b) Subject to the provisions of paragraph (a) hereof moneys in the Renewal and Replacement Fund for a Series of Bonds shall be applied to defray the extraordinary costs of maintaining, repairing, replacing, renovating and improving the Project to which such Fund relates and its equipment and to the repair and replacement of damaged property of such Project. All payments from such Renewal and Replacement Fund to defray such costs shall be made by the Trustee, upon receipt by the Trustee of a certificate of the Authority signed by an Authorized Officer, setting forth in reasonable detail the payments so to be made and that such payments are properly payable from moneys held by the Trustee in such Renewal and Replacement Fund as authorized by this Section.

**Section 5 10. Application of Moneys in the Redemption Fund.**

(a) If the Trustee at any time shall compute the value of the assets of the Debt Service Reserve Fund for a Series of Bonds and such computation discloses that the amount in such Debt Service Reserve Fund is less than the Debt Service Reserve Fund Requirement for such Series of Bonds, the Trustee shall transfer from moneys in the Redemption Fund for such Series of Bonds (other than moneys required to pay the Redemption Price of any Bonds of such Series theretofore called for redemption and moneys required for the purchase of such Bonds theretofore contracted to be purchased) to the Debt Service Reserve Fund for such Series of Bonds the amount, to the extent available, necessary to make the amount on deposit therein equal to the Debt Service Reserve Fund

**Requirement for such Series of Bonds**

- (b) Subject to the provisions of paragraph (a) hereof, moneys in the Redemption Fund for a Series of Bonds shall be applied by the Trustee to the purchase of Bonds of such Series at purchase prices not exceeding the Redemption Price applicable on the next interest payment date on which such Bonds are redeemable, plus accrued interest due, in such manner as the Authority may direct. If seventy-five (75) days prior to any interest payment date on which Bonds of such Series are subject to redemption, moneys in excess of Fifty Thousand Dollars (\$50,000) shall then remain in such Redemption Fund, the Trustee shall, subject to the provisions of paragraph (a) hereof, apply such moneys to the redemption of such Bonds as provided in Article III, at the Redemption Prices as specified in the Applicable Series Resolution.

**Section 5.11 Application of Moneys in the Operating Fund.** Moneys in the Operating Fund for a Series of Bonds shall be held separate and apart from all other funds or moneys of the Authority. Moneys in such Operating Fund shall be used only for the payment of the Operating Expenses of the Project to which such Operating Fund relates. Payments from such Operating Fund shall be made by the Authority pursuant to a requisition of the Authority signed by an Authorized Officer describing in reasonable detail the purposes for which such moneys are to be used and the amount thereof. The Authority covenants that, for the period from the date on which the Authority re-enters a Project to the beginning of the first month for which a budget of Operating Expenses for such Project has been prepared, such payments shall not exceed the actual Operating Expenses incurred by the Authority for such Project. The Authority further covenants that, for the first month included in a budget of Operating Expenses for such Project and for every month thereafter, such payments for any such month shall not exceed the amount provided for Operating Expenses of the Authority for such month.

**Section 5.12 Investment of Moneys.**

(a) Moneys in any of the funds and accounts held by the Trustee pursuant to Section 5.01 may be invested by the Trustee, as shall be directed by the Authority in a written order signed by an Authorized Officer thereof, but, unless otherwise provided in a Series Resolution, only in the following:

- i obligations of or guaranteed by the State of Louisiana or the United States of America,
- ii obligations issued or guaranteed by any instrumentality or agency of the United States of America, whether now existing or hereafter organized,
- iii interest-bearing deposits in any bank or trust company (which may include the Trustee), provided that all such deposits shall, to the extent not insured, be collaterally secured in the manner required by the Act or the Laws of Louisiana for the securing of such deposits, and only as follows:
  - iv moneys in each Interest Account, Principal Account or Sinking Fund Account of each Debt Service Fund only in obligations maturing or redeemable at the option of the holder in such amounts and on such dates as may be necessary to provide moneys to meet the payments from such ACCOUNTS,
  - v moneys in each Debt Service Reserve Fund only in obligations maturing or redeemable at the option of the holder not later than the last maturity date of the Bonds of the Series to which such Fund relates, provided, however, that at all times not less than twenty-five percent (25%) of the amount held in such Debt Service Reserve Fund shall consist of cash and obligations of or guaranteed by the State of Louisiana or the United States of America or any agency or instrumentality of the United States of America maturing or redeemable at the option of the holder not later than five (5) years from the date of purchase thereof,
  - vi moneys in each Renewal and Replacement Fund only in obligations maturing or redeemable at the option of the holder not later than three (3) years from the date of purchase thereof,
  - vii moneys in each Redemption Fund only in obligations maturing or redeemable at the option of the holder not later than the next succeeding interest payment date on which Bonds of the Series to which such Fund relates are subject to redemption, and
  - viii moneys in each Construction Fund only in obligations maturing or redeemable at the option of the holder not later than two (2) years from the date of purchase thereof.

(b) Interest earned, profits realized and losses suffered by reason of any investment shall be credited or charged, as the case may be, to the fund or account for which such investment shall have been made.

(c) The Trustee may sell or redeem any obligations in which moneys shall have been invested as in this Section provided, to the extent necessary, in its sole discretion, to provide cash in the respective funds or accounts, to make any payments required to be made therefrom, or to facilitate the transfers of moneys between various funds and accounts as may be required or permitted from time to time.

(d) In computing the assets of any fund or account, investments and accrued interest thereon shall be deemed a part thereof. Such investments shall be valued at the face value or the current market value thereof, whichever is the lower, or at the redemption price thereof, if then redeemable at the option of the holder, except for the Debt Service Reserve Fund, which shall be valued on the basis of "amortized value," which for the purposes of this section shall mean that the value of securities purchased at a premium above or discount below par is obtained as of a given date by dividing the total dollar amount of the premium or discount at which such securities were purchased by the number of days remaining to maturity on such securities at the time of such purchase and by multiplying the amount so calculated by the number of days having passed since the date of such purchase, and (i) in the case of securities purchased at a premium, by deducting the product thus obtained from the purchase price, and (ii) in the case of securities purchased at a discount, by adding the product thus obtained to the purchase price.

(e) Neither the Trustee nor the Authority shall be liable for any depreciation in the value or any obligations in which moneys of the funds or accounts shall be invested, as aforesaid, or for any loss arising from any investment.

(f) Notwithstanding the foregoing provisions of this Section 5.12, the Trustee shall not make any investment of any moneys held in any fund the effect of which investment would be to make any Series of Bonds "arbitrage bonds" under Section 103(d) of the Internal Revenue Code.

The Authority covenants that it will make no use of the proceeds of any Series of Bonds at any time, which, if such use had been reasonably expected at the time of issuance of such Series of Bonds, would have caused such Series of Bonds to be "arbitrage bonds" within the meaning of Section 103(d) of the Internal Revenue Code and the regulations thereunder as the same may be amended from time to time and that it will comply with the requirements of said Section 103(d) and regulations issued thereunder throughout the term of such Series of Bonds.

**Section 5.13 Deficiencies and Surpluses in Funds.** For the purposes of this Section (i) a "deficiency" shall mean (a) in the case of a Debt Service Reserve Fund, that the amount on deposit therein is less than the Debt Service Reserve Fund Requirement applicable thereto, and (b) in the case of a Renewal and Replacement Fund (but only after the Bond Year in which the amount on deposit therein first equals the applicable Renewal and Replacement Fund Requirement), that the amount on deposit therein is less than the Renewal and Replacement Fund Requirement applicable thereto, and (ii) a "surplus" shall mean (a) in the case of a Debt Service Reserve Fund, that the amount on deposit therein is in excess of the Debt Service Reserve Fund Requirement applicable thereto, and (b) in the case of a Renewal and Replacement Fund, that the amount on deposit therein is in excess of the Renewal and Replacement Fund Requirement applicable thereto.

At the time of any withdrawal from a Debt Service Reserve Fund for a Project or from a Renewal and Replacement Fund for such Project, respectively, which shall result in a deficiency therein, the Trustee shall promptly notify the Authority of the amount of any such deficiency.

The Trustee, as of the close of business on July 1 in each Bond Year, shall compute, in the manner set forth in Section 5.12, the value of the assets of the Debt Service Reserve Fund for a Project and the Renewal and Replacement Fund for such Project and shall as promptly as practicable after such July 1, notify the Authority as to the result of such computation and the amount of any deficiency or surplus as of such July 1 in any such Fund or Funds. The Trustee, as soon as practicable after such computation, shall apply any surplus in the manner and in the amounts as shall be set forth in the Applicable Series Resolution.

The Authority covenants that the amount of any deficiency existing in the Debt Service Reserve Fund as of July 1, in any Bond Year, shall be included as part of the rents, charges or payments due to the Authority on account of the appropriate Project for the Bond Year immediately next succeeding, and any deficiency in the Renewal and Replacement Fund shall be included as part of the rents, charges or payments due to the Authority on account of the appropriate Project for the then current Bond Year in the amounts and in the manner required by the Applicable Series Resolution for the establishment of such

Renewal and Replacement Fund, provided, however, this covenant shall not require the Authority to include as part of such rents, charges or payments, any amount which would necessarily create a surplus as defined herein.

Section 5.14. Information as to Status of Funds. The Trustee shall provide the Authority with such information as the Authority may need to furnish statements to the Institution as to the amounts due under the Lease or shall furnish such statements directly, with copies to the Authority, if so requested by the Authority.

Section 5.15. Application of Moneys in Certain Funds for Retirement of Bonds. Notwithstanding any other provisions of the Resolution and Applicable Series Resolution, if at any time the amounts held in the Revenue Fund, Debt Service Fund, Debt Service Reserve Fund, Renewal and Replacement Fund, and Redemption Fund relating to a Project are sufficient to pay the principal or Redemption Price of all Outstanding Bonds of the Series relating to such Project and the interest accruing on such Bonds to maturity or to the next date of redemption when all such Bonds are redeemable, the Trustee shall so notify the Authority. Upon receipt of such notice, the Authority may request the Trustee to apply such amounts to pay or redeem all such Outstanding Bonds, as the case may be. The Trustee shall, upon receipt of such request in writing by the Authority, proceed to pay or redeem all such Outstanding Bonds in the manner provided by the Resolution and the Applicable Series Resolution, and in such event all provisions of Section 12.01 hereof shall be operative.

## ARTICLE VI

### PARTICULAR COVENANTS

The Authority covenants and agrees as follows:

Section 6.01. Payment of Principal and Interest. The Authority shall pay or cause to be paid from the sources and to the extent provided herein the principal or Redemption Price of and the interest on every Bond of a Series on the date and at the places and in the manner mentioned in such Bonds or in the coupons thereto appertaining, respectively, according to the true intent and meaning thereof, but shall be required to make such payment solely out of its Revenues.

Section 6.02. Extension of Payment of Bonds and Coupons. The Authority shall not directly or indirectly extend or assent to the extension of the maturity of any of the Bonds of a Series or the time of payment of any of the coupons or claims for interest by the purchase or funding of such Bonds, coupons or claims for interest or by any other arrangement and in case the maturity of any of such Bonds or the time for payment of any such coupons or claims for interest shall be extended, such Bonds, coupons or claims for interest shall not be entitled in case of any default hereunder to the benefit of the Resolution and the Applicable Series Resolution or to any payment out of any assets of the Authority or the funds (except funds held in trust for the payment of particular Bonds, coupons or claims for interest pursuant to the Resolution and the Applicable Series Resolution) held by the Trustee, except subject to the prior payment of the principal of all Outstanding Bonds of such Series the maturity of which has not been extended and of such portion of the interest on such Bonds as shall not be represented by such extended coupons or claims for interest. Nothing herein shall be deemed to limit the right of the Authority to issue refunding bonds as permitted hereby, and such issue shall not be deemed to constitute an extension of the maturity of such Bonds.

Section 6.03. Project Revenues. The Authority covenants that adequate provisions will be made to assure that the Revenues derived from each Project will be sufficient at all times: (i) to pay the principal of and/or Sinking Fund Installment and interest on the Series of Bonds issued for such Project as the same respectively become due and payable; (ii) to make the payments required by the Resolution and the Applicable Series Resolution to the Debt Service Reserve Fund and the Renewal and Replacement Fund therefor; and (iii) to pay the expenditures of the Authority incurred in relation to the Project to which such Series of Bonds relates.

The Authority further covenants that, in the event that for any reason the Authority shall re-enter a Project, the Authority shall, within ten (10) days of such date of re-entry, adopt a schedule of charges or fees as of such date of re-entry for the use of such Project, which schedule of charges or fees shall be fixed

and revised from time to time by the Authority. The Authority further covenants to collect such charges or fees or cause the same to be collected. The Authority further covenants that such schedule of fees or charges shall be fixed so that the moneys derived therefrom for the use of such Project will be sufficient at all times (i) to pay the principal and/or Sinking Fund Installment of and interest on the Series of Bonds issued to finance such Project as the same respectively become due and payable, (ii) to pay the Operating Expenses of such Project, and (iii) to maintain the Debt Service Reserve Fund and Renewal and Replacement Fund for such Project at their respective Requirements.

**Section 6.04 Enforcement of Duties and Obligations of Each Institution.** The Authority shall take all legally available action to cause each Institution to fully perform all duties and acts and fully comply with the covenants of such Institution required by the Agreement or the Lease relating to such Institution in the manner and at the times provided in such Agreement or Lease. In the event of repossession of the Project or any portion thereof by the Authority pursuant to the default provisions of the Agreement or the Lease, the Authority shall use its best efforts to derive sufficient Revenues from the Project, with other available funds, to satisfy the obligations of the Institution to the Authority and to pay the Bonds and coupons when due.

**Section 6.05 Project Architect.** Until each Project is completed, the Authority shall employ or cause to be employed an Architect whose duties, among such other duties as may be imposed upon the Architect by the Authority or by this Resolution and the Applicable Series Resolution, shall be the customary duties of an architect in connection with the construction, reconstruction, or renovation as the case may be, and equipment of each part of such Project. The provisions of this Section shall not be applicable to a Project to be acquired by purchase.

**Section 6.06. Operation and Maintenance.** The Authority shall at all times after the completion of each Project operate the same in a sound and economical manner or cause the same to be so operated at such times as the Authority is not in possession thereof. The Authority shall maintain, preserve and keep the same property, or cause the same to be so maintained, preserved and kept, in good repair, working order and condition and shall from time to time make or cause to be made all necessary and proper repairs, replacements and renewals.

**Section 6.07 Alienation of Project.** The Authority shall perform all duties with respect to each Project required by law, and the Agreement or the Lease relating to such Project, and shall not pledge, mortgage or otherwise dispose of any part of such Project necessary, desirable or useful for the operation and maintenance thereof, except as permitted by this Resolution and the Applicable Series Resolution.

**Section 6.08 Insurance.** In addition to the insurance required under Section 4.04 hereof, the Authority shall, at the times specified in the following paragraphs, procure and maintain, or cause to be procured and maintained, the following insurance:

- (a) Commencing with the date that each Project or any part thereof is completed or occupied by the Institution fire, extended coverage, vandalism and malicious mischief insurance, not to exceed ten thousand dollars (\$10,000) deductible on the plant structure machinery equipment and apparatus comprising such Project or part thereof, in an amount not less than eighty per cent (80%) of the replacement value thereof, exclusive of excavations and foundations, provided, however, that the inclusion of such Project under a blanket insurance policy or policies of such Institution insuring against the above hazards in an amount set forth in the Applicable Series Resolution shall be a complete compliance with the provisions of this paragraph. Any such policy shall provide that the insurance company shall give at least ten (10) days' notice in writing to the Authority of the cancellation of the policy. In any event each such policy shall be in an amount sufficient to prevent such Institution and the Authority from becoming co-insurers under the applicable terms of such policy.
- (b) At all times, workmen's compensation insurance, disability benefits insurance, and each other form of insurance which the Authority or such Institution is required by law to provide, covering loss resulting from injury, sickness, disability or death of employees.
- (c) At all times insurance protecting the Authority and such Institution against loss or losses from liabilities imposed by law or assumed in any written contract and arising from bodily injury of persons or damage to the property of others caused by accident or occurrence, with limits of not less than \$1,000,000 per person and \$3,000,000 per accident or occurrence on account of injury.

of persons, and \$500,000 per accident or occurrence on account of injury of the property of others, excluding liability imposed upon the Authority or such institution by any applicable workmen's compensation law.

- (d) At all times, in each event that the Institution is a hospital or the Project is a health care facility, medical liability insurance, to the extent reasonably obtainable, protecting the Authority and such Institution against claims arising from the professional services performed by such Institution, with limits of not less than \$1,000,000 with respect to injury or death to any one person and not less than \$3,000,000 with respect to injury or death to more than one person arising out of a single occurrence
- (e) Fidelity insurance, in such amounts and under such terms as shall be determined by the Authority with due regard to each Institution's funds and accounts, and
- (f) In the event that the Authority shall re-enter a Project as provided for by the Agreement and Lease relating to such Project, the Authority shall maintain, to the extent reasonably obtainable, commencing with the date of such re-entry, use and occupancy insurance on such Project covering the loss of revenues attributable to such Project by reason of necessary interruption, total or partial in the use of such Project resulting from direct physical loss or damage thereto from causes customarily insured. Such insurance shall be in an amount and of such character as will provide a recovery, in the event of the occurrence of any such loss or damage, equal to the amount of such loss of such revenues for not less than a period of two (2) years provided, however, that such insurance may exclude the loss sustained by the Authority during the first fourteen (14) days of total or partial interruption of use.

If any of such insurance provided for in paragraphs (a), (b), (c), (d), and (e) of this Section is under a blanket insurance policy or policies of such Institution, then such institution shall deliver to the Authority in lieu of the original policy or policies a certificate thereof, and such delivery shall be a complete compliance with the provisions of this paragraph. The insurance policies required hereunder or insurance certificates with respect thereto shall be filed with the Trustee.

The proceeds of all such property insurance policies shall either be (i) applied or caused to be applied by the Authority to the repair and replacement of the damaged property of such Project, or (ii) deposited by the Authority with the Trustee for payment into the Revenue Fund relating to such Project accompanied by a certificate of an Authorized Officer of the Authority stating that such deposit is being made pursuant to this Section. The proceeds of any use and occupancy insurance policy or policies shall be deposited by the Authority with the Trustee for payment into such Revenue Fund accompanied by a similar certificate of an Authorized Officer of the Authority.

All policies of insurance shall be payable to the Institution for which such Project has been provided and the Authority, as their interests may appear, and the Authority shall have the sole right to receive the proceeds of such policies for the purposes of this Resolution and the Applicable Series Resolution.

All insurance prescribed by this Section shall be procured from financially sound and reputable insurers qualified to do business in the State of Louisiana. To the extent that any such insurance is not obtainable on reasonable terms, as determined by the Authority, the Authority may make exceptions to the required coverage or provide for reasonable substitutions of coverage. The policies shall be open to inspection by the Trustee at all reasonable times, and a list prepared as of the first day of each Bond Year describing such policies shall be furnished by the Authority to the Trustee annually within forty five (45) days after the beginning of each Bond Year, together with a certificate of an Authorized Officer of the Authority certifying that such insurance meets all requirements of the Resolution. The Trustee shall have no responsibility with respect to any such insurance except to receive such certificates and hold the same for inspection by any Bondholders.

**Section 6.09 Accounts and Audits.** The Authority shall keep proper books of records and accounts (separate from all other records and accounts) in which complete and correct entries shall be made of its transactions relating to each Project and Applicable Series Resolution, which books and accounts, at reasonable hours and subject to the reasonable rules and regulations of the Authority, shall be subject to the inspection of the Trustee or of any holder of a Bond of the Series issued for such Project or his representative duly authorized in writing. The Authority shall cause such books and accounts to be audited annually within ninety (90) days after the end of its fiscal year by a nationally recognized independent public accountant selected by the Authority. Annually within thirty (30) days after the receipt by the

Authority of the report of such audit, a signed copy of such report shall be furnished to the Trustee. Such report shall include at least: a statement of all funds (including investments thereof) held by such Trustee and the Authority pursuant to the provisions of the Resolution and the Applicable Series Resolution, a statement of the moneys received and paid by the Authority and the Trustee in connection with subject Project and Applicable Series Resolution, a statement that the balances in the Debt Service Reserve Fund and the Renewal and Replacement Fund for such Applicable Series Resolution meet the requirements of this Resolution and such Applicable Series Resolution, or, if not, a statement of the deficiency, and a statement that, in making such audit, no knowledge of any default in the fulfillment of any of the terms, covenants or provisions of this Resolution and the Applicable Series Resolution was obtained, or if knowledge of any such default was obtained, a statement thereof.

**Section 6.10. Budget of Operating Expenses.** The Authority covenants that, in the event that for any reason the Authority shall re-enter a Project, the Authority shall prepare, not later than sixty (60) days from the date of such re-entry, a budget of Operating Expenses for such Project, itemized by classification, made or to be made monthly for the balance of the Bond Year. The Authority further covenants that, at least sixty (60) days prior to the beginning of each Bond Year thereafter, the Authority shall prepare a budget of Operating Expenses for such Project, itemized by classification, made or to be made monthly for such Bond Year. Each such budget of Operating Expenses shall be filed by the Authority with the Trustee accompanied by a certificate signed by an Authorized Officer of the Authority stating that such budget has been prepared and is filed in accordance with the provisions of this Section 6.10.

Notwithstanding any other provisions of this Section 6.10 the Authority may, if it deems necessary, amend any such budget of Operating Expenses, and forthwith shall file such amendment with the Trustee in the same manner as provided hereinabove.

**Section 6.11. Indebtedness and Liens.** The Authority, so long as any Bonds of a Series shall be Outstanding, shall not issue any bonds, notes or other evidences of indebtedness, other than the Bonds of such Series and Bonds issued in accordance with the provisions of Sections 2.03 and 2.04, secured by (or otherwise create or cause to be created, any lien or charge on) the Revenues or other moneys, securities or funds required to be held or set aside or applied by the Authority or Trustee, ranking prior to or on a parity with the lien and pledge created by this Resolution and each Applicable Series Resolution but nothing herein contained shall prevent the Authority from issuing obligations (including bonds) having a subordinate lien in respect of the Revenues or other moneys, securities or funds pledged for the security of a Series of Bonds.

**Section 6.12. Payment of Lawful Charges.** The Authority shall pay or shall take all legally available action to cause each Institution to pay all taxes and assessments or other municipal or governmental charges, if any, lawfully levied or assessed upon or in respect of each Project provided for such Institution, or upon any part thereof or upon any Revenues therefrom when the same shall become due, and shall duly observe and comply with or cause such Institution to duly observe or comply with, all valid requirements of any municipal or governmental authority relative to any part of such Project. Except as provided in Section 6.11 hereof, the Authority shall not create or suffer to be created any lien or charge thereon or any part thereof or upon such Revenues, except the pledge and lien of the Bonds, the Resolution and the Applicable Series Resolution. The Authority shall pay or cause to be paid or cause to be discharged, or shall make adequate provisions to satisfy and discharge, within sixty (60) days after the same shall become due and payable, all lawful claims and demands for labor, materials, equipment, supplies or other objects which, if unpaid, might by law become a lien upon a Project or the Revenues relating to such Project, provided, however, that nothing in this Section shall require the Authority to pay or caused to be paid or cause to be discharged, or make provision for, any such lien or charge, so long as the validity thereof shall be contested in good faith and by appropriate legal proceedings.

**Section 6.13. Agreement or Lease.** Each Agreement or Lease shall be executed in at least three counterparts. An executed counterpart shall be filed in the office of the Authority and in the office of the Trustee, and a third executed counterpart delivered to the Institution which is a party thereto. One additional Agreement or Lease in form for recording, shall be prepared for recording with the appropriate recording officer. The Authority covenants not to enter into any amendment of any Agreement or Lease without filing a certified copy thereof with the Trustee.

**Section 6.14. Amendment of a Project.** The Authority shall not consent to any amendment of a Project

as permitted by the Agreement or Lease which shall (i) increase the cost of such Project to an amount in excess of the proceeds of the Bonds available for such Project, unless the Institution for which such Project is being provided shall make available moneys sufficient to pay such excess cost, or (ii) decrease the scope of such Project so that such Project shall be inadequate for the requirements of such Institution. Any such consent shall be given by a resolution of the Authority, and a copy of such resolution certified by an Authorized Officer shall be filed with the Trustee.

**Section 6.15. Deposit of Certain Moneys in the Construction Fund.** In addition to the proceeds of the Bonds of a Series to be deposited in the Construction Fund for such Series of Bonds, any moneys paid to the Authority for carrying out of a Project shall be deposited in such Construction Fund, except as may be otherwise required by applicable law or regulation.

**Section 6.16. Further Assurances.** The Authority shall not enter into any contract or take any action by which the rights of the Trustee or the Bondholders may be impaired and shall, from time to time, execute and deliver such further instruments and take such further action as may be required to carry out the purposes of the Resolution and each Applicable Series Resolution.

**Section 6.17. Filing and Recording.** The Authority shall cause all documents, statements, memoranda or other instruments to be registered, filed or recorded in such manner and at such places as may be required by law fully to protect the security of the Bondholders and the right, title and interest of the Trustee in and to the trust estate or any part thereof. Concurrently with the issuance and delivery of each Series of Bonds, the Authority shall obtain an opinion of Counsel and furnish a signed copy thereof to the Trustee, setting forth what, if any, action by the Authority or Trustee should be taken to protect and preserve such security.

**Section 6.18. Consultant.** In the event that for any reason the Authority shall re-enter a Project, the Authority shall employ a consultant having a favorable national reputation for skill and experience in the management of facilities of the type of which such Project is one, whose duties shall be the customary duties of a consultant in connection with the operation and management of such Project.

## ARTICLE VII

### CONCERNING THE TRUSTEE

**Section 7.01. Appointment and Acceptance of Trustee.** The Trustee shall be appointed in the manner provided in the Applicable Series Resolution. Such appointment shall be made prior to the delivery of the Bonds. Unless the Applicable Series Resolution shall otherwise provide, the Trustee shall also be the Paying Agent and registrar. The Trustee shall signify its acceptance by written notice delivered to the Authority. If such Trustee shall also be the Paying Agent and registrar, its acceptance of the trusts and the duties of Trustee shall also include the trusts and duties of Paying Agent and registrar.

**Section 7.02. Obligation of Trustee.** The Trustee shall be under no obligation to institute any suit or to take any proceeding under this Resolution or the Applicable Series Resolution or to enter any appearance or in any way defend in any suit in which it may be made defendant, or to take any steps in the execution of the trusts hereby created or in the enforcement of any rights and powers hereunder and under the Applicable Series Resolution, until it shall be indemnified to its satisfaction against all counsel fees and other costs and expenses and against all liability. The Trustee may nevertheless begin suit, or appear in and defend suit, or do anything else in its judgment proper to be done by it as the Trustee, without indemnity, and in such case the Authority shall reimburse the Trustee from the pledged Revenues of the Project in relation to which the Trustee has acted for all counsel fees and other costs and expenses properly incurred in connection therewith. If the Authority shall fail to make such reimbursement, the Trustee may reimburse itself from any moneys in its possession under the provisions of this Resolution and the Applicable Series Resolution and shall be entitled to a preference therefor over any of the Bonds or coupons of the Series relating to such Project and Outstanding hereunder and under the Applicable Series Resolution.

**Section 7.03. Responsibilities of Trustee.** The recitals contained in this Resolution, the Applicable Series Resolutions and in the Bonds shall be taken as the statements of the Authority and the Trustee assumes no responsibility for the correctness of the same. The Trustee makes no representations as to the

validity or sufficiency of this Resolution, the Applicable Series Resolution or of the Bonds or in respect of the security afforded by this Resolution or the Applicable Series Resolution and the Trustee shall incur no responsibility in respect thereof. The Trustee shall be under no responsibility or duty with respect to (i) the issue of the Bonds for value, or (ii) the application of the proceeds thereof except to the extent that such proceeds are received by it in its capacity as Trustee, or (iii) the application of any moneys paid to the Authority or others in accordance with this Resolution and the Applicable Series Resolution except as to the application of any moneys paid to it in its capacity as Trustee. The Trustee shall not be liable in connection with the performance of its duties hereunder and under the Applicable Series Resolution except for its own negligence or default.

The duties and obligations of the Trustee shall be determined by the express provisions of this Resolution and the Applicable Series Resolution, and the Trustee shall not be liable except for the performance of such duties and obligations as are specifically set forth therein.

The Trustee shall not be liable for any action taken or omitted by it in good faith and believed by it to be authorized or within the discretion or rights or powers conferred upon it.

**Section 7.04 Property Held in Trust.** All moneys and securities held by the Trustee at any time pursuant to the terms of this Resolution and the Applicable Series Resolution shall be and hereby are assigned, transferred and set over unto the Trustee in trust for the purposes and under the terms and conditions of this Resolution and Applicable Series Resolution.

**Section 7.05 Evidence on which Trustee May Act.** The Trustee shall be protected in acting upon any paper or document believed by it to be genuine. The Trustee may consult with counsel, who may or may not be of counsel to the Authority or Institution, and the opinion of such counsel shall be full and complete authorization and protection, in respect of any action taken or suffered by it in good faith and in accordance therewith. Whenever the Trustee shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action, such matter (unless other evidence in respect thereof be hereby specifically proscribed) may be deemed to be conclusively proved and established by a certificate signed by an Authorized Officer of the Authority. Such certificate shall be full warrant for any action taken or suffered in good faith upon the faith thereof, but in its discretion the Trustee may in lieu thereof accept other evidence of such fact or matter or may require such further or additional evidence as it may deem reasonable. Except as otherwise expressly provided, any request, order, notice or other direction required or permitted to be furnished by the Authority to the Trustee shall be sufficiently executed if executed in the name of the Authority by an Authorized Officer.

**Section 7.06 Compensation.** Unless otherwise provided by contract with the Trustee, the Authority shall pay or cause to be paid, from the pledged Revenues, to the Trustee from time to time, reasonable compensation for all services rendered by it hereunder, including its services as registrar and paying agent, and also all its reasonable counsel fees and other disbursements and those of its attorneys, agents, and employees, incurred in and about the performance of its powers and duties hereunder and the Trustee shall have a lien therefor on any and all funds at any time held by it hereunder and under the Applicable Series Resolution prior to any of the Bonds for which such services have been rendered. The Authority shall indemnify and save the Trustee harmless, from the pledged Revenues, against any expenses and liabilities which it may incur in the exercise and performance of its powers and duties, and which are not due to its negligence or default. None of the provisions contained in this Resolution or the Applicable Series Resolution shall require the Trustee to expend or risk its own funds or otherwise incur financial liability in the performance of any of its duties or in the exercise of any of its rights or powers, if there is reasonable ground for believing that the repayment of such funds or liability is not reasonably assured to it.

**Section 7.07 Permitted Acts.** The Trustee may become the owner of or may deal in Bonds as fully and with the same rights as if it were not the Trustee. The Trustee may act as depository for, and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, the Authority or any committee formed to protect the rights of Bondholders or to effect or aid in any reorganization growing out of the enforcement of the Bonds or this Resolution or the Applicable Series Resolution, whether or not such committee shall represent the holders of a majority in principal amount of the Outstanding Bonds of the Series in respect of which any such action is taken.

**Section 7.08 Resignation of Trustee.** The Trustee may at any time resign and be discharged of its duties and obligations by giving not less than sixty (60) days written notice to the Authority and publishing

notice thereof, specifying the date when such resignation shall take effect, at least once in an Authorized Newspaper, the first publication to be made within ten (10) days after the giving of such written notice. Such resignation shall take effect upon the date specified in such notice unless previously a successor shall have been appointed by the Authority as provided in Section 7 10 in which event such resignation shall take effect immediately on the appointment of such successor.

**Section 7.09 Removal of Trustee.** The Trustee for a Series of Bonds may be removed at any time by the holders of a majority in principal amount of the Outstanding Bonds of such Series, excluding any Bonds of such Series held by or for the account of the Authority, by an instrument or concurrent instruments in writing signed by such Bondholders or by their attorneys-in-fact duly authorized and delivered to the Authority. Copies of each such instrument providing for any such removal shall be delivered by the Authority to such Trustee and any successor thereof.

**Section 7 10 Successor Trustee.** In case the Trustee shall resign or shall be removed or shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or if a receiver, liquidator or conservator of the Trustee or of its property shall be appointed, or if any public officer shall take charge or control of the Trustee, or of its property or affairs, a successor shall be appointed by the Authority forthwith, with notification thereof being given to the predecessor Trustee and the Institution for which such Series of Bonds has been issued. Copies of any resolution of the Authority providing for any such appointment shall be delivered by the Authority to the Trustee so appointed, the predecessor Trustee and such Institution. The Authority shall publish notice of any such appointment at least once in an Authorized Newspaper, the first publication to be made within twenty (20) days after such appointment.

If in a proper case no appointment of a successor shall be made within forty-five (45) days after the giving of written notice in accordance with Section 7 08 or after the occurrence of any other event requiring or authorizing such appointment, the Trustee or any Bondholder may apply to any court of competent jurisdiction for the appointment of such a successor, and such court may thereupon, after such notice, if any, as such court may deem proper, appoint such successor. Any successor appointed under the provisions of this Section shall be a bank or trust company having a capital and surplus aggregating at least \$10,000,000, if there be such a bank or trust company willing and able to accept the appointment on reasonable and customary terms and authorized by law to perform all the duties required by this Resolution and the Applicable Series Resolution.

**Section 7 11 Transfer of Rights and Property to Successor Trustee.** Any successor appointed under the provisions of Section 8 10 shall execute and deliver to its predecessor, and also to the Authority, an instrument accepting such appointment, and thereupon such successor, without any further act, shall become fully vested with all moneys, estates, properties, rights, powers, duties and obligations of its predecessor hereunder and under the Applicable Series Resolution, with like effect as if originally appointed as Trustee. However, the Trustee then ceasing to act shall nevertheless, on request by the Authority or of such successor, execute, acknowledge and deliver such instruments of conveyance and further assurance and do such other things as may reasonably be required for more fully and certainly vesting and confirming in such successor all the right, title and interest of such Trustee in and to any property held by it hereunder, and shall pay over, assign and deliver to such successor any moneys or other properties subject to the trusts and conditions herein set forth. Should any deed, conveyance or instrument in writing from the Authority be required by such successor for more fully and certainly vesting in and confirming to it any such moneys, estates, properties, rights, powers, duties or obligations, such deeds, conveyances and instruments in writing shall, on request, and so far as may be authorized by law, be executed, acknowledged and delivered by the Authority.

**Section 7 12. Merger or Consolidation of the Trustee.** Any company into which the Trustee may be merged or with which it may be consolidated or any company resulting from any merger or consolidation to which it shall be a party or any company to which such Trustee may sell or transfer all or substantially all of its corporate trust business, provided such company shall be a bank or trust company qualified to be a successor to such Trustee under the provisions of Section 7 10, shall be the successor to such Trustee, without any further act.

## ARTICLE VIII

### REMEDIES

**Section 8 01 Events of Default** Each of the following events is hereby declared an event of default hereunder and under the Applicable Series Resolution (herein called "event of default") if

(a) Payment of the principal or Redemption Price of any of the Bonds of a Series shall not be made when the same shall become due and payable, either at maturity or by proceedings for redemption or otherwise, or

(b) Payment of the Sinking Fund Installment is not made when due, or

(c) Payment of an installment of interest on any Bonds of a Series shall not be made when the same shall become due and payable and such default shall continue for a period of thirty (30) days, or

(d) Final judgment for the payment of money shall be rendered against the Authority as a result of the ownership, control or operation of a Project or any part thereof and at any time after sixty (60) days from the entry thereof, (i) such judgment shall not have been discharged, or (ii) the Authority shall not have taken and be diligently prosecuting an appeal therefrom or from the order, decree or process upon which or pursuant to which such judgment shall have been granted or entered and have caused the execution of or levy under such judgment, order, decree or process or the enforcement thereof to have been stayed pending determination of such appeal, or

(e) An order or decree shall be entered, with the consent or acquiescence of the Authority, appointing a receiver or receivers of a Project or any part thereof or of the pledged Revenues thereof, or if such order or decree, having been entered without the consent or the acquiescence of the Authority, shall not have been vacated or discharged or stayed on appeal within sixty (60) days after the entry thereof, or

(f) Any proceeding shall be instituted, with the consent or acquiescence of the Authority, for the purpose of effecting a composition between the Authority, and its creditors or for the purpose of adjusting the claims of such creditors, pursuant to any Federal or state statute now or hereafter enacted, if the claims of such creditors are under any circumstances payable from the Revenues of a Project, or

(g) The Authority shall default in the due and punctual performance of any other of the covenants, conditions, agreements and provisions contained in the Bonds of a Series or in this Resolution or the Applicable Series Resolution on the part of the Authority to be performed and such default shall continue for thirty (30) days after written notice specifying such default and requiring same to be remedied shall have been given to the Authority by the Trustee, which may give such notice in its discretion and shall give such notice at the written request of the holders of not less than five per cent (5%) in principal amount of the Outstanding Bonds of such Series

A default under an Applicable Series Resolution in respect of a Series of Bonds shall not constitute a default under any other Applicable Series Resolution or in respect of any other Series of Bonds.

**Section 8 02 Acceleration of Maturity** Upon the happening and continuance of any event of default specified in Section 8 01, the Trustee may, and upon the written request of the holders of not less than twenty-five per cent (25%) in principal amount of the Outstanding Bonds of a Series shall, by a notice in writing to the Authority, declare the principal of all of the Outstanding Bonds of such Series to be due and payable immediately. At the expiration of thirty (30) days from the giving of notice of such declaration such principal shall become and be immediately due and payable, anything in the Bonds of such Series or in this Resolution or the Applicable Series Resolution to the contrary notwithstanding. At any time after the principal of the Bonds of such Series shall have been so declared to be due and payable, and before the entry of final judgment or decree in any suit, action or proceeding instituted on account of such default, the Trustee may with the written consent of the holders of not less than twenty-five per cent (25%) in principal amount of the Bonds of such Series not then due by their terms and then Outstanding and by written notice to the Authority, annul such declaration and its consequences if (i) all amounts then payable by the Authority hereunder and under the Applicable Series Resolution shall have been paid or a sum sufficient to pay the same shall have been deposited with the Trustee, and (ii) every other event of default known to the Trustee in the observance or performance of any covenant, condition or agreement contained in the Bonds of such Series or in this Resolution (other than a default in the payment of the principal of such Bonds then due only because of a declaration under this Section) or the Applicable Series

Resolution shall have been remedied to the satisfaction of the Trustee. No such annulment shall extend to or affect any subsequent default or impair any right consequent thereon.

**Section 8 03 Enforcement of Remedies** Upon the happening and continuance of any event of default specified in Section 8 01 the Trustee may proceed, and upon the written request of the holders of not less than twenty-five per centum (25%) in principal amount of the Outstanding Bonds of a Series shall proceed (subject to the provisions of Section 7 02), to protect and enforce its rights and the rights of the holders of the Bonds of such Series by such suits, actions or proceedings in equity or at law, either for the specific performance of any covenant contained hereunder and under the Applicable Series Resolution or in aid or execution of any power herein granted, or for an accounting against the Authority as if the Authority were the trustee of an express trust, or for the enforcement of any proper legal or equitable remedy as the Trustee shall deem most effectual to protect and enforce such rights.

In the enforcement of any remedy under this Resolution and under the Applicable Series Resolution, the Trustee shall be entitled to sue for, enforce payment of, and receive all amounts then or during any default becoming, and at any time remaining, due from the Authority for principal or interest or otherwise under any of the provisions of this Resolution or the Applicable Series Resolution or of the Bonds, with interest on overdue payments at the applicable rate or rates, together with all costs and expenses of collection and of all proceedings hereunder and under the Applicable Series Resolution and under such Bonds, without prejudice to any other right or remedy of the Trustee or of the holders of such Bonds, and to recover and enforce judgment or decree against the Authority but solely as provided herein and in such Bonds, for any portion of such amounts remaining unpaid, with interest, costs and expenses, and to collect in any manner provided by law, the moneys adjudged or decreed to be payable.

**Section 8 04 Priority of Payments After Default** Notwithstanding any other provisions hereof, if at any time the moneys held by the Trustee under this Resolution and the Applicable Series Resolution for the payment of the interest or principal then due on the Bonds of a Series are insufficient for the purpose, the moneys in the Interest Account, Principal Account, Sinking Fund Account, Debt Service Reserve Fund, Renewal and Replacement Fund, Redemption Fund (other than moneys required to pay the Redemption Price of any Bonds of such Series theretofore called for redemption and moneys required for the purchase of such Bonds theretofore contracted to be purchased) and Revenue Fund shall be applied (in the order in which such accounts and funds are named in this Section) as follows:

**FIRST** To the payment of the costs of the Trustee, including counsel fees, any disbursements of the Trustee with interest thereon and its reasonable compensation.

**SECOND** To the payment of interest then due, in the order of the maturity of the installments of such interest, and, if the amount available shall not be sufficient to pay in full any particular installment, then to the payment ratably, according to the amounts due on such installment, without any discrimination or preference, and

**THIRD** To the payment of the unpaid principal of any of the Bonds of such Series which shall have become due (other than Bonds of such Series called for redemption or contracted to be purchased for the payment of which moneys are held pursuant to the provisions of this Resolution and the Applicable Series Resolution) and, if the amount available shall not be sufficient to pay such principal in full, then to the payment ratably, according to the amounts of principal due, without any discrimination or preference.

Whenever moneys are to be applied by the Trustee pursuant to the provisions of this Section, such moneys shall be applied by the Trustee at such times, and from time to time, as the Trustee in its sole discretion shall determine, having due regard to the amount of such moneys available for application and the likelihood of additional moneys becoming available for such application in the future. The setting aside of such moneys in trust for the proper purpose shall constitute proper application by the Trustee, and the Trustee shall incur no liability whatsoever to the Authority, to any Bondholder or to any other person for any delay in applying any such moneys so long as the Trustee acts with reasonable diligence, having due regard to the circumstances, and ultimately applies the same in accordance with such provisions of this Resolution and the Applicable Series Resolution as may be applicable at the time of application by the Trustee. Whenever the Trustee shall exercise such discretion in applying such moneys, it shall fix the date (which shall be an interest payment date unless the Trustee shall deem another date more suitable) upon which such application is to be made, and upon such date interest on the amounts of principal to be paid

on such date shall cease to accrue. The Trustee shall give such notice as it may deem appropriate of the fixing of any such date. The Trustee shall not be required to make payment to the holder of any unpaid coupon or any Bond unless such coupon or such Bond shall be presented to the Trustee for appropriate endorsement.

Any moneys coming into an account or fund named in this Section after an application of moneys by the Trustee under this Section and prior to the next such application shall, to the extent necessary, be retained by the Trustee for the next such application. This Section shall cease to be applicable when all interest and principal due on the Series of Bonds have been paid, but shall become applicable again if the occasion arises.

**Section 8.05 Effect of Discontinuance of Proceedings:** In case any proceedings taken by the Trustee on account of any default in respect of a Series of Bonds shall have been discontinued or abandoned for any reason or shall have been determined adversely to the Trustee, then and in every such case the Authority, the Trustee and the Bondholders of such Series shall be restored to their former positions and rights hereunder, respectively, and all rights, remedies, powers and duties of the Trustee shall continue as though no such proceeding had been taken.

**Section 8.06 Majority of Bondholders of a Series May Control Proceedings:** The holders of a majority in principal amount of the Outstanding Bonds of a Series shall have the right, subject to the provisions of Section 7.02 by an instrument in writing executed and delivered to the Trustee, to direct the method and place of conducting all remedial proceedings to be taken by the Trustee under this Resolution and under the Applicable Series Resolution, provided such direction shall not be otherwise than in accordance with law or the provisions of this Resolution and the Applicable Series Resolution, and that the Trustee shall have the right to decline to follow any such direction which in the opinion of the Trustee would be unjustly prejudicial to Bondholders not parties to such direction.

**Section 8.07 Restrictions Upon Action by Individual Bondholders:** No holder of any of the Bonds of a Series shall have any right to institute any suit, action or proceeding in equity or at law for the execution of any trust hereunder and under the Applicable Series Resolution or for any other remedy hereunder and under such Applicable Series Resolution unless such holder previously shall have given to the Trustee written notice of the event of default on account of which such suit, action or proceeding is to be instituted, and unless also the holders of not less than twenty five percent (25%) in principal amount of the Outstanding Bonds of such Series shall have made written request to the Trustee after the right to exercise such powers or right of action, as the case may be, shall have accrued, and shall have afforded the Trustee a reasonable opportunity either to proceed to exercise the powers granted by this Resolution and such Applicable Series Resolution or to institute such action, suit or proceeding in its or their name, and unless, also, there shall have been offered to the Trustee reasonable security and indemnity against the costs, expenses, and liabilities to be incurred therein or thereby, and the Trustee shall have refused or neglected to comply with such request within a reasonable time. Such notification, request and offer of indemnity are hereby declared in every such case at the option of the Trustee, to be conditions precedent to the execution of the powers and trusts of this Resolution and such Applicable Series Resolution or for any other remedy hereunder and thereunder. It is understood and intended that no one or more holders of the Bonds of a Series secured by this Resolution and such Applicable Series Resolution shall have any right in any manner whatever by his or their action to affect, disturb or prejudice the security of this Resolution and such Applicable Series Resolution or to enforce any right hereunder except in the manner herein provided, and that all proceedings at law or in equity shall be instituted and maintained for the benefit of all holders of the Outstanding Bonds and coupons of such Series.

**Section 8.08 Actions by Trustee:** All rights of action under the Resolution and the Applicable Series Resolution or under any of the Bonds of a Series enforceable by the Trustee, may be enforced by it without the possession of any of such Bonds or the coupons appertaining thereto or the production thereof at the trial or other proceeding relative thereto.

**Section 8.09 Remedies Not Exclusive:** No remedy herein conferred upon the Trustee or the holders of the Bonds of a Series is intended to be exclusive of any other remedy, and each such remedy shall be in addition to every other remedy given hereunder and under the Applicable Series Resolution or now or hereafter existing at law or in equity or by statute.

**Section 8.10 Waiver and Non-Waiver:** No delay or omission of the Trustee or of any holder of the

Bonds of a Series to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default or an acquiescence therein. Every power and remedy given by this Article to the Trustee and the holders of the Bonds of a Series may be exercised from time to time and as often as may be deemed expedient.

The Trustee may and upon written request of the holders of not less than twenty-five per cent (25%) of the principal amount of the Outstanding Bonds of a Series shall, with respect to such Series of Bonds, waive any default which in its opinion shall have been remedied before the entry of final judgment or decree in any suit, action or proceeding instituted by it under the provisions of this Resolution and the Applicable Series Resolution, but no such waiver shall extend to or affect any other existing or any subsequent default or defaults or impair any rights or remedies consequent thereon.

Section 8 11 Notice of Default. The Trustee may publish in an Authorized Newspaper written notice of the occurrence of any event of default set forth in clause (a), (b) or (c) of Section 8 01 after any such event of default shall have occurred.

## ARTICLE IX

### SERIES RESOLUTIONS

Section 9 01 Adoption and Filing. The Authority may adopt at any time or from time to time Series Resolutions to authorize the issue of a Series of Bonds as provided in Section 2 02 and 2 03 and a copy thereof certified by an Authorized Officer of the Authority shall be filed with the Trustee.

Section 9 02 General Provisions Relating to Series Resolutions. A copy of each Series Resolution adopted by the Authority when filed with the Trustee shall be accompanied by an opinion of Bond Counsel stating that such Series Resolution has been duly and lawfully adopted in accordance with the provisions of this Resolution, is authorized or permitted by this Resolution, and is valid and binding upon the Authority and enforceable in accordance with its terms.

The Trustee is hereby authorized to accept delivery of a certified copy of any Series Resolution permitted or authorized pursuant to the provisions of this Resolution and to make all further agreements and stipulations which may be contained therein, and, in taking such action, the Trustee shall be fully protected in relying on an opinion of Bond Counsel that such Series Resolution is Authorized or permitted by the provisions of this Resolution.

## ARTICLE X

### AMENDMENTS AND SUPPLEMENTS OF THE RESOLUTION

Section 10 01 Amendments without Consent. Notwithstanding any other provisions of this Article X, the Authority may adopt at any time or from time to time a Supplemental Resolution supplementing this Resolution or any Series Resolution or any Supplemental Resolution for one or more of the following purposes:

(a) To add to the covenants and agreements of the Authority contained in this Resolution or any Series Resolution, other covenants and agreements thereafter to be observed,

(b) To surrender any right, power or privilege reserved to or conferred upon the Authority by this Resolution or any Series Resolution, and

(c) To confirm, as further assurance, any pledge under and the subjection to any lien or pledge created or to be created by this Resolution or a Series Resolution of the Revenues derived from any Project.

Such Supplemental Resolution shall become effective upon the filing with each Trustee affected thereby of a copy thereof certified by an Authorized Officer of the Authority.

Section 10 02 Supplemental Resolutions Regarding Ambiguities with Consent of Each Trustee Affected. At any time or from time to time but subject to the conditions or restrictions in this Resolution and each Series Resolution contained, a Supplemental Resolution may be adopted by the Authority curing any ambiguity or curing, correcting or supplementing any defect or inconsistent provisions contained in this Resolution or any Series Resolution or making such provisions in regard to matters or questions arising

under this Resolution or any Series Resolution as may be necessary or desirable and not contrary to or inconsistent with this Resolution or any Series Resolution. However, no such Supplemental Resolution shall be effective until after the filing with each Trustee affected thereby of a copy of such Supplemental Resolution certified by an Authorized Officer of the Authority, and the filing with the Authority of an instrument in writing made by each such Trustee consenting to such Supplemental Resolution.

**Section 10 03 Supplemental Resolutions Effective with Consent of Bondholders**

(a) At any time or from time to time but subject to the conditions or restrictions in this Resolution and each Series Resolution contained, a Supplemental Resolution may be adopted by the Authority modifying any of the provisions of this Resolution, any Series Resolution, or of any of the Bonds. However, no such Supplemental Resolution shall be effective until after the filing with each Trustee affected thereby of a copy of such Supplemental Resolution certified by an Authorized Officer of the Authority and unless such Supplemental Resolution is consented to by or on behalf of the Bondholders affected thereby in accordance with the provisions of Article IX and Article X hereof. Any such modification shall require the consent of the holders obtained as provided in Article X of at least sixty six and two-thirds per cent (66 2/3%) in principal amount of all Outstanding Bonds affected thereby.

(b) Notwithstanding paragraph (a) of this Section, except as provided in Section 11 03, no such modification changing any terms of redemption of Bonds of a Series, due date of principal of or interest on Bonds of such Series or making any reduction in principal or Redemption Price of or interest on any Bond of such Series shall be made without the consent of the affected Bondholder.

(c) Notwithstanding any other provisions of this Section, no Supplemental Resolution shall be adopted by the Authority, except as provided in Section 11 03, reducing the percentage of consent of Bondholders of a Series of Bonds required for any modification of this Resolution or the Applicable Series Resolution.

(d) The provisions of paragraph (a) of this Section shall not be applicable to Supplemental Resolutions adopted in accordance with the provisions of Section 10 01 or Section 10 02.

**Section 10 04 Restriction on Amendments.** Neither the Resolution, any Series Resolution, nor the Bonds shall be modified in any respect except as provided in and in accordance with and subject to the provisions of clause (12) of Section 2 02 or this Article X and Article XI. No Supplemental Resolution shall modify any of the rights or obligations of the Trustee without its written consent.

**Section 10 05 Adoption and Filing of Supplemental Resolutions.** Any Supplemental Resolution adopted by the Authority and taking effect under Section 10 01, 10 02, 10 03 or 11 03 shall thereupon form a part of this Resolution or of the Applicable Series Resolution, as the case may be. Any such Supplemental Resolution when filed with each Trustee affected thereby shall be accompanied by an opinion of Bond Counsel to the effect that such Supplemental Resolution has been duly and lawfully adopted by the Authority in accordance with the provisions of this Resolution and the Applicable Series Resolution, is authorized or permitted by this Resolution and the Applicable Series Resolution, and constitutes the lawful and binding obligation of the Authority in accordance with its terms.

**Section 10 06 Authority of Trustee.** Each Trustee affected thereby is hereby authorized to accept delivery of a certified copy of any such Supplemental Resolution and to make all further agreements and stipulations which may be therein contained, and each such Trustee, in taking such action, shall be fully protected in relying on an opinion of Bond Counsel that such Supplemental Resolution is authorized or permitted by the provisions of this Resolution and the Applicable Series Resolution.

## ARTICLE XI

### CONSENTS

**Section 11 01 Mailing and Publication.**

(a) Any provision in this Article XI for the mailing of a notice or other paper to the holders of Bonds of a Series shall be fully complied with if it is mailed, postage prepaid, by the Authority only to: (i) each registered owner of Outstanding Bonds of such Series at his address, if any, appearing upon the registry books of the Authority, (ii) each holder of any Bond of such Series payable to bearer who shall have filed with the Authority an address for notices, and (iii) the Trustee.

(b) Any provision in this Article XI for publication of a notice or other matter shall require one (1)

publication thereof only, by the Authority, in an Authorized Newspaper unless otherwise specifically provided.

**Section 11 02 Consent of Bondholders** Upon the adoption of a Supplemental Resolution under Section 10 03, a copy thereof, certified by an Authorized Officer of the Authority, shall be filed with the Trustee for the inspection of the Bondholders affected. A copy of such Supplemental Resolution (or summary thereof) together with a request to such Bondholders for their consent thereto in form satisfactory to the Trustee, shall be mailed by the Authority to such Bondholders and shall be published at least once a week for two (2) successive weeks in an Authorized Newspaper (but failure to mail such copy and request shall not affect the validity of the Supplemental Resolution when consented to as in this Section provided). Such Supplemental Resolution shall not be effective unless and until there shall have been filed with the Trustee the written consents of the percentage of holders of Outstanding Bonds specified in Section 10 03 and a notice shall have been published as hereinafter in this Section provided. Each such consent shall be effective only if accompanied by proof of ownership of the Bonds for which such consent is given, which proof shall be such as is permitted hereinafter by this Section or Section 12 04. A certificate or certificates by the Trustee, which shall be placed on file, that it examined such proof and that such proof is sufficient, shall be conclusive that the consents have been given by the holders of the Bonds described in such certificate or certificates of the Trustee. Any consent shall be binding upon the holder of the Bonds giving such consent and on any subsequent holder of such Bonds (whether or not such subsequent holder has notice thereof) unless such consent is revoked in writing by the holder of such Bonds giving such consent or a subsequent holder by filing revocation with the Trustee at least fifteen (15) days prior to the date when the notice hereinafter in this Section provided for is first published. The fact that a consent has not been revoked may likewise be proved by a certificate of the Trustee which shall be placed on file. At any time after the holders of the required percentage of Bonds shall have filed their consent to the Supplemental Resolution and such Supplemental Resolution shall have been consented to by the Trustee (if such consent is required) a notice shall be given to such Bondholders by the Authority by making such notice to such Bondholders (but failure to mail such notice shall not prevent such Supplemental Resolution from becoming effective as herein provided), and publishing the same in an Authorized Newspaper at least once not more than ninety (90) days after the holders of the required percentage of such Bonds shall have filed their consents to the Supplemental Resolution. The Authority shall file with the Trustee proof of giving such notice. Such notice shall state in substance that the Supplemental Resolution (which may be referred to as a resolution adopted by the Authority on a stated date, a copy of which is on file with the Trustee) has been consented to by the holders of the required percentage of Bonds and shall be effective as provided in this Section. A record, consisting of the papers required or permitted by this Section to be filed with the Trustee, shall be proof of the matters therein stated. Upon such publication, such Supplemental Resolution shall become effective and conclusively binding upon the Authority, the Trustee, and the holders of all Bonds and coupons.

**Section 11 03. Modifications by Unanimous Action** Notwithstanding the foregoing provisions of this Article XI, the provisions of this Resolution, any Series Resolution, or the Bonds may be modified in any respect upon the adoption of a Supplemental Resolution by the Authority and the consent of the holders of all of the Outstanding Bonds affected by such modification, such consent to be given as provided in Section 11 02, except that no notice to Bondholders either by mailing or publication shall be required.

**Section 11 04 Exclusion of Bonds.** Bonds owned or held by or for the account of the Authority shall not be deemed Outstanding Bonds for the purpose of any consent or other action or any calculation of Outstanding Bonds provided for in this Article, and shall not be entitled to consent or take any other action provided for in Article X and Article XI. At the time of any consent or other action taken under Article X and Article XI, the Authority shall furnish the Trustee a certificate signed by an Authorized Officer upon which the Trustee may rely, describing all Bonds so to be excluded.

**Section 11 05. Notation on Bonds.** Bonds authenticated and delivered after the effective date of any action taken as in Article X and Article XI provided may, and, if the Trustee so determines, shall, bear a notation by endorsement or otherwise in form approved by the Authority and the Trustee as to such action, and in that case, upon demand of the holder of any Outstanding Bond and presentation of his Bond for such purpose to the Trustee, suitable notation shall be made on such Bond by the Trustee as to any such action, if the Authority or the Trustee shall so determine, new Bonds so modified as in the opinion of

the Trustee and the Authority to conform to such action shall be prepared, authenticated and delivered, and upon demand of the holder of any Outstanding Bond shall be exchanged, without cost to such Bondholder, for such Outstanding Bond upon surrender of such Outstanding Bond with all unmatured coupons, and matured coupons in default, if any, appertaining thereto

## ARTICLE XII

### MISCELLANEOUS

**Section 12 01 Powers as to Bonds and Pledge** The Authority covenants that it is duly authorized under the Act and all applicable laws to issue the Bonds, to adopt this Resolution and the Applicable Series Resolutions, and to pledge the Revenues and other moneys, securities and funds pledged by this Resolution and the Applicable Series Resolutions in the manner and to the extent provided herein and in the Applicable Series Resolutions. The Authority further covenants that the Revenues and other moneys, securities and funds so pledged are and shall be free and clear of any pledge, lien, charge or encumbrance thereon or with respect thereto, prior to, or of equal rank with, the pledge created by this Resolution and the Applicable Series Resolution, and that all corporate action on the part of the Authority to that end has been duly and validly taken. The Authority further covenants that the Bonds and the provisions of this Resolution and the Applicable Series Resolution are and shall be the valid and legally enforceable obligations of the Authority in accordance with their terms. The Authority shall at all times, to the extent permitted by law, defend, preserve and protect the pledge of the Revenues and other moneys, securities and funds pledged under this Resolution and the Applicable Series Resolution, and all of the rights of the Bondholders under this Resolution and the Applicable Series Resolution against all claims and demands of all persons whomsoever.

**Section 12 02 Further Assurance, Holding of Instruments by Trustee** The Authority shall, so far as it may be authorized by law, pass, make do, execute, acknowledge and deliver, such further resolution, acts, deeds, covenances, assignments, transfers and assurances as may be necessary or desirable for the better assuring, conveying, granting, assigning and confirming the rights and Revenues and other moneys, securities and funds hereby pledged or assigned, or intended to be, or which the Authority may hereafter become bound to pledge or assign. The Authority hereby irrevocably constitutes and appoints the Trustee its agent to accept and hold in the name and on behalf of the Authority any instruments of conveyance and other instruments provided to be delivered to it pursuant to the Agreement or the Lease relating to a Project.

**Section 12 03 Defeasance.** (a) When the Authority shall pay or cause to be paid the principal or Redemption Price of and interest on the Bonds of a Series and all other sums payable by the Authority pursuant to this Resolution and the Applicable Series Resolution, then the pledge of any Revenues or other moneys and securities hereby pledged to such Series of Bonds and all other rights granted hereby and by the Applicable Series Resolution to such Series of Bonds shall be discharged and satisfied. In such event, the Trustee shall, upon the request of the Authority, execute and deliver to the Authority all such instruments as may be desirable to evidence such discharge and satisfaction and the Trustee shall pay or deliver to the Authority all moneys or securities held by it pursuant to this Resolution and the Applicable Series Resolution which are not required for the payment or redemption of Bonds of such Series or coupons not theretofore surrendered for such payment or redemption.

(b) Bonds of a Series or coupons for the payment or redemption of which moneys shall then be held by the Trustee (through deposit by the Authority of moneys for such payment or redemption or otherwise), whether at or prior to the maturity or the redemption date of such Bonds, shall be deemed to have been paid within the meaning of this Section 12 03, provided however, that (i) if any such Bonds are to be redeemed prior to the maturity thereof, the Authority shall have taken all action necessary to redeem such Bonds and notice of such redemption shall have been duly given or provision satisfactory to the Trustee shall have been made for the giving of such notice, and (ii) if the maturity or redemption date of any such Bond shall not then have arrived, provision shall have been made by the Authority by deposit with the Trustee for the payment to the holders of any such Bonds and coupons upon surrender thereof, whether or not prior to the maturity or redemption date thereof of the full amount in cash, or in whole or in part.

investment obligations permitted under items (i) and (iii) of subsection 5 12(a) hereof, the principal of and interest on which when due will equal such full amount to which they would be entitled by way of principal or Redemption Price of and interest thereon to the date of such maturity or redemption, and provisions shall have been made by the Authority, satisfactory to the Trustee, for one publication in an Authorized Newspaper of a notice to the holders of such Bonds and coupons that such moneys are so available for such payment.

(c) Anything in this Resolution to the contrary notwithstanding, any moneys held by the Trustee in trust for the payment and discharge of any of the Bonds of a Series or coupons which remain unclaimed for five (5) years after the date when all of the Bonds of such Series have become due and payable either at their stated maturity dates or by call for earlier redemption, if such moneys were held by the Trustee at such date, or for five (5) years after the date of deposit of such moneys if deposited with the Trustee after such date when all of the Bonds of such Series become due and payable, shall, at the written request of the Authority, be repaid by the Trustee to the Authority and the Trustee shall thereupon be released and discharged, provided, however, that, before being required to make any such payment to the Authority, the Trustee may, at the expense of the Authority, cause to be published in an Authorized Newspaper a notice that such moneys remain unclaimed and that, after a date named in such notice, which date shall be not less than forty (40) nor more than ninety (90) days after the date of publication of such notice, the balance of such moneys then unclaimed shall be returned to the Authority.

**Section 12 04. Evidence of Signatures of Bondholders and Ownership of Bonds.** Any request, consent or other instrument which this Resolution may require or permit to be executed by the Bondholders may be in one or more instruments of similar tenor, and shall be signed by such Bondholders in person or by their attorneys duly appointed in writing. Proof of the execution of any such instrument, or of an instrument appointing any such attorney, or the holding by any person of such Bonds, shall be sufficient for any purpose of this Resolution (except as otherwise herein expressly provided) if made in the following manner, but the Trustee may nevertheless in its discretion require further or other proof in cases where it deems the same desirable:

(a) The fact and date of the execution by any Bondholder or his attorney of such instrument may be proved by the certificate, which need not be acknowledged or verified, of an officer of a bank or trust company satisfactory to the Trustee or of any notary public or other officer authorized to take acknowledgments of deeds to be recorded in the state in which he purports to act, that the person signing such request or other instrument acknowledged to him the execution thereof, or by an affidavit of a witness of such execution, duly sworn to before such notary public or other officer. The authority of the person or persons executing any such instrument on behalf of a corporate Bondholder may be established without further proof if such instrument is signed by a person purporting to be the president or a vice-president of such corporation with a corporate seal affixed and attested by a person purporting to be its secretary or an assistant secretary.

(b) The amount of Bonds transferable by delivery held by any person executing such request or other instrument as a Bondholder, and the numbers and other identification thereof, and the date of his holding such Bonds, may be proved by a certificate (which need not be acknowledged or verified), satisfactory to the Trustee, executed by an officer or partner of a bank, trust company, or other financial firm or corporation satisfactory to the Trustee, showing that at the date therein mentioned such person exhibited to such officer or partner or had on deposit with such depository the Bonds described in such certificate.

The ownership of Bonds registered otherwise than to bearer and the amount, numbers and other identification, and date of holding the same shall be proved by the registry books. Any request, consent or vote of the owner of any Bond shall bind all future owners of such Bond.

**Section 12 05. Preservation and Inspection of Documents.** All documents received by the Trustee from the Authority or from Bondholders under the provisions of this Resolution or Applicable Series Resolution shall be retained in its possession and shall be subject at all reasonable times to the inspection of the Authority, the Institution, any Bondholder and their agents and their representatives, any of whom may make copies thereof.

**Section 12 06. Moneys and Funds Held for Particular Bonds.** The amounts held by the Trustee for the payment of the principal or Redemption Price of and interest on the Bonds of a Series due on any date with respect to particular Bonds or coupons shall, pending such payment, be set aside and held in trust by it

for the holders of such Bonds and coupons entitled thereto, and for the purposes of this Resolution such principal or Redemption Price of and interest on such Bonds shall no longer be considered to be unpaid.

**Section 12.07 Cancellation of Bonds and Coupons.** The Trustee shall forthwith cancel all Bonds and coupons which have been redeemed or paid by it and may destroy such Bonds or coupons and deliver a certificate to that effect to the Authority.

**Section 12.08 No Recourse on the Bonds.** No recourse shall be had for the payment of the principal or Redemption Price of and interest on the Bonds or for any claims based thereon or on this Resolution or Applicable Series Resolution against any member or other officer of the Authority or any person executing the Bonds, all such liability, if any, being expressly waived and released by every Bondholder by the acceptance of the Bond. The Bonds are payable from the Revenues derived by the Authority from the ownership, operation and leasing of the Project and neither the faith and credit nor the taxing power of the State of Louisiana or any political subdivision thereof, is pledged to the payment of the principal or interest on the Bonds.

**Section 12.09 Laws Governing; Severability.** This Resolution shall be construed and enforced in accordance with the Constitution and laws of the State of Louisiana.

If any provisions of this Resolution shall be held or deemed to be or shall in fact be inoperative or unenforceable as applied in any particular case in any jurisdiction or jurisdictions or in all jurisdictions, or in all cases because it conflicts with any other provision or provisions hereof or any constitution or statute or rule of public policy, or for any other reason, such circumstances shall not have the effect of rendering the provisions in question inoperative or unenforceable in any other case or circumstance, or of rendering any other provision or provisions herein contained invalid, inoperative, or unenforceable to any extent whatsoever.

The validity of any one or more phrases, sentences, clauses, paragraphs or sections in this Resolution shall not affect the remaining portions of this Resolution or any part thereof.

**Section 12.10 Notices.** Any notices or other instruments to the Authority pursuant to this Resolution or a Series Resolution shall be in writing and shall be deemed given when mailed, postage prepaid, by registered or certified mail to it at its office in the City of New Orleans, Louisiana, or such other address as it shall designate to the Trustee in writing, and any notice or other instrument to the Trustee pursuant to this Resolution or a Series Resolution shall be in writing and shall be deemed given when mailed, postage prepaid, by registered or certified mail to it at the principal office of the Trustee at the address of such principal office.

**Section 12.11 Other Resolutions.** The Authority reserves the right to adopt one or more other bond resolutions and to issue bonds, notes and other obligations thereunder without compliance with the provisions hereof.

**Section 12.12 Limited Obligation.** Any obligation of the Authority to incur expenditures in respect to a Project shall be limited to the moneys provided therefor under this Resolution and the Applicable Series Resolution, but this limitation shall not prevent a failure to perform such obligation from becoming an event of default under Section 8.03. For this purpose, the Annual Administrative Fee and Initial Administrative Fee shall be deemed available only for administrative expenses of the Authority.

**Section 12.13 Immunity of Authority.** In the exercise of the powers of the Authority and its officers under this Resolution, the Applicable Series Resolution, the Agreement and the Lease, including (without limiting the foregoing) the application of moneys, the investment of funds, the raising or other disposition of the Project in the event of default by the Institution, the Authority shall not be accountable to the holders of the Bonds and coupons, the Trustee or the Institution for any action taken or omitted by it or its officers in good faith and believed by it or them to be authorized or within the discretion or rights or powers conferred. The Authority shall be protected in its or their acting upon any paper or document believed by it or them to be genuine, and it and they may conclusively rely upon the advice of counsel and may (but need not) require further evidence of any fact or matter before taking any action.

**Section 12.14 Section Headings.** The section headings have been prepared for convenience only and are not a part of this Resolution and shall not be taken as an interpretation of any provision of this Resolution.

**Section 12.15 Effective Date and Publication of Resolution, Incontestability.** This Resolution shall take effect immediately upon its adoption. This Resolution after its adoption shall be published once in a

newspaper of general circulation in the City of Baton Rouge, Louisiana. For a period of thirty (30) days after the date of such publication of this Resolution, any person or persons in interest shall have the right to contest the legality of this Resolution and the legality of the Bonds authorized to be issued hereby for any cause, after which time no one shall have any cause or right of action to contest the legality of this Resolution or of the Bonds authorized hereby for any cause whatsoever. If no suit, action or proceedings are begun contesting the validity of the Bonds within the thirty (30) days herein prescribed, the authority to issue the Bonds and to provide for the payment thereof, the legality thereof and of all of the provisions of this Resolution shall be conclusively presumed, and no court shall have authority to inquire into such matters.

This resolution having been submitted to a vote, the vote thereon was as follows:

YEAS: Dr. Robert Charbonnet, Mr. C.C. Clifton, Jr., Mr. S.L. Drumm, Dr. Adolph Flores, Jr., Mr. John P. Laborde, and Mr. Revis Ortigue, Jr.

NAYS: None

ABSENT: Dr. James Ciavella, Mr. Darwin S. Fenner, Mr. Roy T. Sessums, Dr. Eugene St. Martin, and Mr. Carl T. Smith, Jr.

And the resolution was adopted on this, the 6th day of March, 1974.

/s/Carl T. Smith, Jr.

SECRETARY, BOARD OF TRUSTEES

/s/John P. Laborde

CHAIRMAN, BOARD OF TRUSTEES

**STATE OF LOUISIANA  
PARISH OF ORLEANS**

I, the undersigned Secretary of the Board of Trustees of the Health Education Authority of Louisiana, do hereby certify that the foregoing thirty-five (35) pages constitute a true and correct copy of a resolution adopted by said Board of Trustees on March 6, 1974, entitled "General Resolution Providing for the Issuance of Revenue Bonds" of the Health Education Authority of Louisiana.

IN FAITH WHEREOF, witness my official signature at New Orleans, Louisiana, on this, the        day of        , 19        .

---

Secretary

**NEW ISSUE**

*In the opinion of Bond Counsel, based on existing laws, regulations and judicial decisions, interest on the Bonds is exempt from all present Federal income taxation and the Bonds and the interest thereon are exempt from taxation under the laws of the State of Louisiana.*

**\$37,500,000**

**Health Education Authority of Louisiana**

**Revenue Bonds**

**Tulane University Medical Center Issue, Series A**

Dated: July 1, 1974

Due: July 1, as shown below

Principal and semi-annual interest (from January 1, 1975 payable July 1, 1975 and each January 1 and July 1 thereafter) are payable at the principal office of First National Bank of Commerce, New Orleans, Louisiana, the Trustee. The Bonds are issuable in the form of coupon Bonds in denominations of \$5,000 registrable as to principal only, or as to principal and interest, at the principal office of the Trustee. The Bonds are subject to redemption prior to maturity as described herein.

<u>Amount</u>	<u>Due</u>	<u>Interest Rate</u>	<u>Yield</u>	<u>Amount</u>	<u>Due</u>	<u>Interest Rate</u>	<u>Yield</u>
\$ 400,000	1978	9½%	5.60%	\$1,240,000	1987	7½%	6.60%
500,000	1979	9½	5.60	1,240,000	1988	7½	6.75
600,000	1980	9½	5.70	1,240,000	1989	7½	6.90
1,000,000	1981	9½	5.80	1,240,000	1990	7½	7.05
1,200,000	1982	9½	5.90	1,240,000	1991	7½	7.20
1,240,000	1983	9½	6.00	1,240,000	1992	7½	7.30
1,240,000	1984	9½	6.15	1,240,000	1993	7½	7.40*
1,240,000	1985	9½	6.30	1,240,000	1994	7½	7.50
1,240,000	1986	7½	6.45				

\* Priced to call

**\$18,620,000 7½% Term Bonds Due July 1, 2009**

**Price: 100%**

*(Annual interest to be added.)*

*These Bonds are offered herein, as and if issued, subject to prior sale, to withdrawal or modification of the offer without notice, and to the approval of legislative and certain other matters by Messrs. Foley, Judell, Bush, Bradley & Landwehr, Bond Counsel of New Orleans, Louisiana. It is expected that the Bonds in definitive form will be available for delivery on or about January 8, 1975.*

EXHIBIT 4.3.d

November 19, 1974

D-1-41

No dealer, broker, salesman or other person has been authorized by the Health Education Authority of Louisiana or The Administrators of The Tulane Educational Fund (Tulane University of Louisiana) to give any information or to make any representations with respect to the Bonds, other than those contained in the Official Statement, and, if given or made, such other information or representations must not be relied upon as having been authorized by either of the foregoing. Certain information contained herein has been obtained from The Administrators of the Tulane Educational Fund (Tulane University of Louisiana) and other sources which are believed to be reliable, but it is not guaranteed as to accuracy or completeness, and is not to be construed as a representation of the Health Education Authority of Louisiana. The information and expressions of opinion herein are subject to change without notice and neither the delivery of the Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the parties referred to above since the date hereof.

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## OFFICIAL STATEMENT

Relating to

**\$37,500,000**

**Health Education Authority of Louisiana**

**Revenue Bonds**

**Tulane University Medical Center Issue, Series A**

November 19, 1974

The purpose of this Official Statement is to set forth certain information concerning the Health Education Authority of Louisiana (sometimes referred to herein as either 'HEAL' or the "Authority") and the \$37,500,000 Health Education Authority of Louisiana Revenue Bonds Tulane University Medical Center Issue, Series A (the 'Bonds') authorized by the General Bond Resolution adopted by HEAL on March 6, 1974 and by the Series Resolution adopted by HEAL on July 3, 1974 (both resolutions sometimes hereinafter collectively called the "Resolution"). The Bonds are to be issued in accordance with the provisions of the Resolution and Act 112 of the 1968 Regular Session of the Legislature of Louisiana (the "Act"). The information contained in this Official Statement is provided for use in connection with the sale of the Bonds.

The Bonds and any additional Bonds which may be issued pursuant to the Resolution (see "Additional Bonds" under "THE BONDS") are special obligations of HEAL equally and ratably payable from and secured by a pledge of the revenues to be derived by HEAL from its ownership of the Project (hereinafter defined) including the revenues received by the Trustee (hereinafter defined) for the account of HEAL pursuant to a Lease and Agreement (the "Lease") executed by HEAL and The Administrators of the Tulane Educational Fund (sometimes referred to herein as either "Tulane" or the "Institution"). As security for its obligation to make payments to the Trustee Tulane has granted to HEAL a first lien on all Gross Receipts (defined in the Lease) to be derived by Tulane from its operation of the Project.

### Disposition of Bond Proceeds

The proceeds to be received from the sale of the Bonds including accrued interest thereon together with certain other moneys will be used to: (1) pay interest due on the Bonds from January 1, 1975 to and including June 30, 1976; (2) establish with the Trustee a Debt Service Reserve Fund (defined in the Resolution); (3) pay certain expenses incurred by HEAL in connection with the issuance of the Bonds; and (4) pay the costs of acquiring the Project. A more detailed description of the use of Bond proceeds, including purposes and approximate amounts is set forth hereinafter under "ESTIMATED COSTS AND SOURCES OF FUNDS".

### The Project

The Project consists of a site of approximately three acres and to be located thereon a new seven-story hospital and ambulatory care teaching facility and an adjacent nine-story parking facility designed to accommodate approximately 375 cars. The Project which will be more fully described hereinafter under "THE PROJECT" is located on the easterly side of Tulane Avenue in the City of New Orleans, Louisiana and will include all of Tulane's land and buildings required for the operation of such Project. Construction of the Project was approved on June 29, 1973 by a Certificate of Need granted by the Louisiana State Office of Comprehensive Health Planning.

#### Conveyances of the Project

Under the terms of the Lease, Tulane will, at or prior to the delivery of the Bonds, sell and convey to HEAL the Project site and the partially-constructed Project facilities located thereon. Thereafter Tulane will sell and convey to HEAL portions of the Project facilities including fixtures, furniture, equipment and effects therein and additions thereto and renewals thereof as such are constructed, attached or installed on the Project site. HEAL shall lease to Tulane the Project so acquired until all of the Bonds have been fully paid or provision for such payment shall have been made as provided in the Resolution.

#### THE SECURITY

The Lease, dated as of July 1, 1974, provides that (i) it is a general obligation of Tulane, (ii) the full faith and credit of Tulane are pledged to the payment of Tulane's obligations thereunder, and (iii) it shall remain in full force and effect until the Bonds and the interest thereon have been fully paid or otherwise discharged. The Lease also provides, among other things, that rental payments are to be made by Tulane to HEAL in aggregate amounts sufficient to pay when due principal or unlong fund installments, as the case may be, interest on the Bonds, redemption prices, if any, and certain other payments required by the Resolution and that Tulane shall be obligated to make such payments so long as any of the Bonds are outstanding or until adequate provision for such payments has been provided. Such payments, which are required by the Resolution and the Lease, are to be assigned by the Resolution to First National Bank of Commerce, New Orleans, Louisiana (the "Trustee").

As additional security for the rental payments and to ensure the prompt payment of such moneys, Tulane has agreed to establish with the Trustee a special fund of Tulane (the "Rental Payment Fund") to be held in the custody of the Trustee separate and apart from all other funds and accounts of Tulane. HEAL and the Trustee, Tulane shall from all Gross Receipts to be derived from the operation of the Project, or if necessary, from its general funds, make payments into the Rental Payment Fund beginning on the first business day of each month until the moneys so deposited for such month are equal to one-twelfth of the annual debt service requirements on the Bonds as well as certain other payments required by the Lease. The Trustee shall make payments from the Rental Payment Fund to the appropriate funds created by the Resolution in amounts and at the times necessary to provide for debt service payments on the Bonds as well as other payments required by the Lease.

The Lease provides that all covenants and agreements on the part of Tulane and HEAL are to be for the benefit of the holders of the Bonds and that all rights of HEAL to the moneys receivable under the Lease are pledged and assigned to the Trustee.

Neither the State of Louisiana nor HEAL shall be obligated to pay the principal of or interest on the Bonds except from the revenues derived by HEAL from its ownership of the Project, including the revenues received from Tulane under the Lease. Neither the faith and credit nor the taxing power of the State of Louisiana or of any political subdivision thereof is pledged to the payment of the principal of or interest on the Bonds.

The Resolution provides that (1) the Resolution shall constitute a contract between HEAL, the Trustee and the holders of the Bonds and coupons relating thereto, (2) the Bonds shall be special obligations of HEAL payable from and secured by a pledge of the Revenues (defined in the Resolution) as provided by the Resolution, (3) HEAL pledges and assigns to the Trustee the Revenues and all income and receipts earned on funds held by the Trustee for HEAL under the Resolution as security for (a) the payment of the Bonds and the interest thereon and (b) the performance of any other obligation of HEAL under the Resolution, (4) the pledge made by the Resolution is valid and binding from the time when such pledge is made, (5) the pledge made by the Resolution and the covenants and agreements set forth therein to be performed by or on behalf of HEAL shall be for the equal and ratable benefit, protection and security of the holders of the Bonds and coupons relating thereto, all of which regardless of their times of issue or maturity shall be of equal rank without preference, priority or distinction over any other Bond or coupon relating thereto except as expressly provided in or permitted by the Resolution, (6) the Revenues and all income and receipts earned on funds held by the Trustee for HEAL under the Resolution shall immediately be subject to the lien of the pledge

without any physical delivery thereof or further act and (7) the lien of the pledge shall be valid and binding as against all parties having claims of any kind in tort, contracts or otherwise against HEAL irrespective of whether such parties have notice thereof.

### HEALTH EDUCATION AUTHORITY OF LOUISIANA

The Health Education Authority of Louisiana is a body corporate and public, constituting an instrumentality of the State of Louisiana, created and existing under the Act. Under the Act, HEAL has developed and is implementing a master plan for a cooperative and coordinated multi-institutional medical complex in which the Charity Hospital of Louisiana at New Orleans (the "Charity Hospital"), the Louisiana State University and Agricultural and Mechanical College medical center (the "LSU Medical Center"), and the Tulane University of Louisiana medical center (the "Tulane Medical Center") are the Primary Institutions (as defined in the Act). The Eye, Ear, Nose and Throat Hospital and the Veterans Administration Hospital, which are located in the City of New Orleans, have become Participating Institutions (as defined in the Act) within the medical complex. Other hospitals and medical and health-oriented organizations may become Participating Institutions within the medical complex.

HEAL's overall responsibilities include, among others, assisting the Primary Institutions in implementing their individual plans for expansion and facilitating the sharing of services among the Primary and Participating Institutions to eliminate unnecessary duplication and fragmentation of programs and to minimize costs. Under the Act, HEAL has, among others, the following powers: to acquire real and personal property by lease, purchase, donation or otherwise, to construct hospitals, clinics or any other facilities, buildings or structures which may be of use, benefit or support in the teaching, training or practice of medical science and treatment of human ailments, and to issue its bonds, notes or other certificates or indebtedness for any of its purposes. HEAL may not construct any of the facilities authorized under the Act except at the request of any one of the Primary Institutions and until it has determined after a public hearing thereon, that there is a public need and necessary for such facilities.

#### HEAL Membership and Organization

HEAL is governed by a Board of Trustees which consists of the Governor of the State of Louisiana, as *ex-officio* trustee, and eleven other persons selected for six-year terms pursuant to the requirements for membership contained in the Act. The present members and officers of HEAL's Board of Trustees are as follows:

Reynolds O. Orreum, Jr., *Chairman*, a practicing attorney-at-law, is the at-large appointee of the Governor for a term ending July 31, 1976. He was formerly a member of the President's Commission on Campus Unrest and is past President of the Urban League and the National Bar Association.

Steenbo L. Drouin, *Vice Chairman*, Vice President of Gulf States Assets Management Inc. is a nominee of Tulane appointed by the Governor for a term ending July 31, 1976. He was formerly President of West Penn Power Company.

C. C. Clinton, *Secretary*, a businessman, is the at-large appointee of the Mayor of the City of New Orleans, Louisiana for a term ending July 31, 1976. He is a member of the Boards of Governors of Tulane Medical Center and Ochsner Hospital and the Boards of Trustees of the Southern Eye Bank and the Council for a Better Louisiana.

Ray T. Sessoms, *Treasurer*, retired Vice President of Freeport Sulphur Company, is a nominee of Louisiana State University appointed by the Governor for a term ending July 31, 1978. He was formerly Dean of the School of Engineering and a Professor of Civil Engineering at Louisiana Tech. He is presently a Director of the American Bank and Trust Company, Baton Rouge, Louisiana, and formerly served on the President's Water Pollution Control Advisory Board.

Robert Charbonnet, D.D.S., a practicing dentist, is the nominee of the Louisiana Dental Association appointed by the Governor for a term ending July 31, 1980. He is a Delegate to the American and Louisiana Dental Associations and is past President of the New Orleans Dental Association.

James M. Giarravella, M.D., a practicing physician, is a nominee of Charity Hospital appointed by the Governor for a term ending July 31, 1978. He is a member of the medical staff at the Hotel Dieu Hospital, New Orleans, Louisiana.

Darwin S. Fenner, President of Gulf States Assets Management, Inc., is a nominee of Tulane appointed by the Governor for a term ending July 31, 1980. He was Chairman of the HEAL Board of Trustees from September, 1968 through September 1972. He is presently an Advisory member of the Board of Administrators of Tulane and was formerly Senior Vice President of Merrill Lynch, Pierce, Fenner & Smith retiring December 31, 1970.

Adolph A. Floras, M.D., a practicing physician, is a nominee of the Louisiana State Medical Society appointed by the Governor for a term ending July 31, 1978. He is an assistant cardiologist at the Southern Baptist Hospital, a Clinical Professor of Medicine at Louisiana State University, and the head of the New Orleans Civil Defense medical division.

Samuel L. Gill, M.D., a practicing physician, is a nominee of the Louisiana State Medical Society appointed by the Governor for a term ending July 31, 1980.

John P. Laborde, President of Tidewater Marine Services, is a nominee of Louisiana State University appointed by the Governor for a term ending July 31, 1980. He is the immediate past Chairman of the HEAL Board of Trustees. He is presently a Director of the Hibernia National Bank, New Orleans, Louisiana.

Dorothy Mae Taylor, a Representative to the Legislature of the State of Louisiana, is a nominee of Charity Hospital appointed by the Governor for a term ending July 31, 1980.

In addition, the Act provides that HEAL may appoint such officers, agents and employees as it may require. HEAL has appointed W. W. McDougall as its Executive Director. Mr. McDougall is responsible for the management of HEAL's operations.

**Bonds Outstanding of HEAL**

HEAL has heretofore authorized and issued one series of its revenue bonds. The following table indicates the series, the date, the amount issued, the amount retired and the outstanding balance of such series as of November 1, 1974.

<u>Series</u>	<u>Amount Issued</u>	<u>Amount Retired</u>	<u>Amount Outstanding</u>
Lease-Rental Revenue Bonds, Series of 1973 (New Orleans Parking Facility), dated June 1, 1973	\$3,300,000	\$ —	\$3,300,000

With respect to other bond issues, HEAL intends to enter into separate agreements with health care institutions for the purpose of providing or financing projects for such institutions. HEAL intends to issue series of bonds for the purpose of financing projects pursuant to such agreements and each such series will be pursuant to a series resolution separate and apart from the Series Resolution.

**TULANE UNIVERSITY OF LOUISIANA**

**History**

Tulane was founded in 1834 as the Medical College of Louisiana, the first medical school in the Deep South and Southwest. In 1847 the newly-chartered University of Louisiana in New Orleans incorporated this college as its Medical Department and added a Law Department. The Collegiate Department, forerunner of Tulane's present College of Arts and Sciences was started in 1850. Renamed Tulane University of Louisiana in 1884, Tulane subsequently developed the Graduate School of Business Administration, the School of Social Work and the Covarrady College, which conducts programs in adult education. Newcomb College, founded in 1886, was the first coordinate college for women in the United States to prepare degree candidates. In 1967 the Division of Hygiene and Tropical Medicine became the School of Public Health and Tropical Medicine (the "School of Public Health and Tropical Medicine").

### **Board of Administrators**

Tulane is governed by a board of administrators incorporated in 1884 as The Administrators of the Tulane Educational Fund (the 'Board of Administrators'). The Board of Administrators is composed of 17 elected members who serve for 15 years or until the age of 70, 16 advisory members who are retired members with all privileges of membership except voting, and the Governor of the State of Louisiana, the Mayor of the City of New Orleans, Louisiana, and the Louisiana State Superintendent of Education, who serve as *ex officio* members without voting privileges during their respective terms of public office. In addition Tulane established a board of visitors in 1951 which presently consists of 30 elected or appointed members. The board of visitors which is empowered to consider any and all problems of Tulane, submits written reports and recommendations to the Board of Administrators for its review and possible implementation. The present members of the Board of Administrators represent a cross-section of business, community, industrial, governmental and public interests.

### **Colleges and Schools**

Tulane is composed of the following 11 colleges and schools which offer a wide range of undergraduate, graduate and professional courses of study for men and women: School of Architecture, College of Arts and Sciences, Graduate School of Business Administration, School of Engineering, Graduate School, School of Law, School of Medicine (the 'School of Medicine'), School of Public Health and Tropical Medicine, Newcomb College, School of Social Work and University College. All of the colleges and schools are coeducational except Newcomb College for women and the College of Arts and Sciences for men. These two colleges operate in a coordinate pattern designed to complement each other in course offerings and in areas of specialization.

### **Accreditation**

Tulane is a member of the Association of American Universities and is accredited by the Southern Association of Colleges and Secondary Schools. Tulane reports that the accreditations and memberships of its colleges and schools include: National Architectural Accrediting Board, The American Assembly of Collegiate School of Business, Engineers Council for Professional Development, Southern Association of Colleges and Secondary Schools, Association of Graduate Schools, American Association of Universities, American Bar Association, The Association of American Law Schools, Liaison Committee on Medical Education of the American Medical Association, Association of American Medical Colleges, American Public Health Association, Southern Association of Colleges and Schools, Council of Social Work Education, Southern Association of Colleges and Universities.

### **Academic Programs**

Academic programs include the humanities, the social sciences, the natural sciences and the professional fields including engineering education, business administration, law, medicine, dentistry, and philosophy. These programs are presently staffed by a faculty of 708 full-time and 886 part-time members.

### **Principal Academic Units and Facilities**

Tulane's 11 academic units are located on two campuses. Nine of these units are on the 100-acre main campus situated in the uptown residential section of the City of New Orleans. In addition to its regular academic sessions which include two regular semesters and an annual Summer session, Tulane offers continuing education courses through its evening division located on the main campus.

The principal physical facilities located on the main campus include 13 residential and dining halls, 31 academic buildings, all athletic facilities, various libraries holding a total of approximately 1,160,000 volumes, a student union center, and several administration buildings.

The School of Medicine and the School of Public Health and Tropical Medicine are located in the Tulane Medical Center situated in the downtown section of the City of New Orleans adjacent to Charity Hospital which presently serves as Tulane Medical Center's principal teaching hospital. The Tulane Medical Center's current physical expansion program which includes a new 310-bed acute care hospital and ambulatory care

teaching facility (see "Tetz Project" hereinafter) will be integrated with HEAL's master plan to meld the Tulane Medical Center, Charity Hospital and LSU Medical Center facilities into a physically reared multi-institutional medical complex.

#### Student Enrollment

Tulane reports that it has experienced modest growth since the academic year 1963-64. For the academic year 1974-75 total Fall enrollments, excluding the evening division, were 8,108 as compared to 5,696 students for the academic year 1963-64. The following tabulation based on Fall registration has been prepared by Tulane to show actual past enrollments:

Year	Full-Time Undergraduate	School of Medicine		School of Public Health & Tropical Medicine	Other Graduate & Professional	Evening Division and Part Time Undergraduate	Total	
		Medical Students	Graduate Students				Academic Year	Summer Session
1974-75	4,643	593	408	242	2,222	940	9,048	N/A
1973-74	4,403	574	411	195	2,223	693	8,639	2,750
1972-73	4,455	566	389	196	2,331	934	8,871	2,630
1971-72	4,252	552	367	195	2,290	1,076	8,732	3,083
1970-71	4,023	538	324	176	2,134	1,274	8,469	3,013
1969-70	3,887	514	387	131	1,934	1,361	8,234	3,070
1968-69	3,780	505	379	149	1,938	1,608	8,359	3,419
1967-68	3,751	510	362	90	1,959	1,655	8,327	3,211
1966-67	3,586	511	311	113	2,020	1,698	8,259	3,215
1965-66	3,546	507	293	92	1,915	1,729	8,082	3,163
1964-65	3,351	509	304	80	1,725	1,813	7,762	2,748
1963-64	3,194	499	323	57	1,623	1,764	7,460	2,630

There has been a decline in enrollment in the evening division over the years, however, such decline has little bearing on revenue from tuition and fees.

#### Tuition and Fees

Tulane reports that student tuitions for full-time study during the 1972-73 and 1973-74 academic years and the tuitions which have been set for the 1974-75 and 1975-76 academic years are as follows:

	1972-73	1973-74	1974-75	1975-76
Undergraduates	\$2,400	\$2,500	\$2,600	\$3,000
School of Medicine	2,400	2,500	2,600	3,500
School of Public Health and Tropical Medicine	2,400	2,500	2,600	3,500
Other Graduate and Professional	2,275	2,420	2,500	4,000
Evening Division (per course)	135	145	153	162

In addition to its tuition fees, Tulane has certain other fees which for the 1974-75 academic year include an application fee of \$20.00 for undergraduate and graduate students.

Tulane has the power to alter or revise its charges and fees and to increase or decrease them from time to time as the Board of Administrators may determine. Such alterations or revisions may be effected without notice.

#### Income and Expenditures

Tulane accounts for its financial resources through the use of four separately-balanced fund groups, namely: current, loan, endowment and auxiliary and plant. A comparative balance sheet as of June 30, 1975 and June 30, 1972, a statement of changes in fund balances for the two years ended June 30, 1973, a statement of current fund revenues, expenditures, and other changes for the five years ended June 30, 1973, notes to the financial statements, and the report of Tulane's certified public accountants in regard to such financial statements are included as APPENDIX A to this Official Statement.

For the year ended June 30 1973 Tulane reports that current unrestricted expenditures and transfers exceeded revenues by \$396,639. For the year ended June 30 1974 Tulane reports that current unrestricted expenditures and transfers are expected to exceed current fund revenues by approximately \$1,383,000. Tulane reports that such operating deficits were budgeted and expected. The fiscal year 1973-74 deficit was and the fiscal year 1974-75 deficit will be funded by transfers from funds comprising an endowment—unrestricted. As set forth hereinafter under "Endowment and Similar Funds" capital gains realized on Tulane's endowment and similar funds investments totalled \$2,116,943 during fiscal year 1972-73. Tulane estimates that capital gains realized on its endowment and similar funds investments totalled \$1,700,000 during fiscal year 1973-74. In addition, the book value of Tulane's endowment and similar funds investments increased from \$40,391,873 in fiscal year 1971-72 to \$42,600,399 in fiscal year 1972-73 and is estimated to have increased to approximately \$43,000,000 in fiscal year 1973-74.

Tulane reports that it is benefiting from a program of the State of Louisiana whereby the State through a capitation plan for Louisiana residents enrolled in the School of Medicine, provided \$265,000 in 1973-74 and will provide \$305,000 in 1974-75.

#### Gifts, Grants and Bequests

Total gifts, grants, and bequests to Tulane (excluding grants and contracts for sponsored research and training) for the six years ended June 30, 1974, and the purposes for which they were given were as follows:

	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74 (Est.)</u>
Current operations						
Unrestricted	\$1,052,544	\$1,622,756	\$1,316,662	\$1,893,335	\$2,191,774	\$2,997,000
Restricted	2,731,953	3,263,306	3,508,499	4,169,224	3,378,747	4,232,000
Loan funds	4,535	2,910	3,313	11,397	23,388	N/A
Endowment and similar funds	380,100	347,406	231,110	180,669	314,312	N/A
Capital construction	1,640,617	2,747,630	3,102,543	909,358	444,933	N/A

Tulane has long been a center for programs of research and training. Total funds received under grants and contracts awarded to Tulane from private and governmental agencies for sponsored research and training during the five years ended June 30, 1973, were as follows:

1968-69	\$19,448,347
1969-70	18,370,775
1970-71	17,939,461
1971-72	17,267,266
1972-73	16,823,061

#### Endowment and Similar Funds

The market value of Tulane's endowment and similar funds assets with their corresponding book values at June 30 for the past six years, as well as the income generated and capital gains realized by the investments is presented below:

	Market Value	Book Value	Annual Income		Capital Gains Realized
			Unrestricted	Restricted	
1973-74 (Est.)	\$43,000,000	\$43,000,000	\$1,660,000	\$325,000	\$1,700,000
1972-73	43,798,000	42,600,399	1,722,656	303,133	2,116,943
1971-72	47,454,000	40,391,873	1,836,867	290,730	927,968
1970-71	49,122,000	37,704,647	2,056,320	275,229	1,207,668
1969-70	46,394,000	41,418,514	1,986,980	259,046	2,339,907
1968-69	51,892,000	40,950,071	2,091,276	238,852	1,235,291

As shown in Appendix A hereto, the fund balances of Tulane's endowment and similar funds are subdivided into appropriate classifications. Endowment comprises funds received from benefactors who by the terms of the conveying instruments have restricted the principal of their gifts and bequests. Life income funds are those funds received under agreements to pay their earnings to donor-designated beneficiaries for certain periods of time, after which the principal and earnings become available to Tulane. Funds functioning as endowment represent expendable funds received from donors and grantors which, by decision of the Board of Administrators, have been retained and invested for the future benefit of Tulane, but which can be utilized, if and when the need arises, for current operating and construction expenditures. Certain funds functioning as endowment are restricted in whole or in part and may only be expended for the specific purposes designated by the donors and grantors.

#### Plant Assets

The following tabulation, extracted from the audited financial statements of Tulane, sets forth the book value of Tulane's land and improvements, buildings, and equipment as of June 30 of the indicated fiscal years:

	<u>Land and Improvements</u>	<u>Buildings</u>	<u>Equipment</u>	<u>Total</u>
1973.....	\$3,211,988	\$59,421,973	\$23,220,725	\$85,854,686
1972.....	3,211,988	58,988,024	21,377,135	83,577,147
1971.....	3,029,154	58,090,618	19,287,319*	80,407,091
1970.....	3,015,029	50,231,780	11,914,640	65,161,449
1969.....	3,015,389	49,353,483	11,584,883	63,953,755
1968.....	2,999,029	43,209,965	10,991,338	57,200,333
1967.....	3,005,030	43,209,966	10,780,450	56,995,446
1966.....	2,583,393	41,432,318	10,406,891	54,422,602

\* The substantial increase in the book value of equipment from 1970 to 1971 was the result of a comprehensive inventory of movable equipment which became a basis for revaluing the book value of equipment.

Tulane presently carries, under various blanket insurance policies, property insurance based on 90% of the sound insurable value of its buildings and their contents, excluding land and building foundations. Tulane also carries boiler and machinery insurance, workmen's compensation insurance and, under a blanket insurance policy, insurance at various limits exceeding \$5,000,000 against exposure at Tulane's foreign facilities. Tulane has covenanted in the Lease to maintain the insurance provided for in Sections 4.03 and 6.08 of the Resolution.

In accordance with generally accepted accounting practices for colleges and universities, Tulane does not depreciate its physical plant assets. However, in place of depreciation, Tulane allocates a portion of its current unrestricted revenues each year for the future replacement of facilities and equipment of certain of its auxiliary enterprise facilities as required by the bond indentures relating to Tulane's outstanding indebtedness. These allocations are reflected as provisions for renewals and replacements which are charged to current funds expenditures for auxiliary enterprises as shown in Appendix A attached hereto. The aforementioned provisions and transfers for renewals and replacements are fully funded and are accounted for as part of Tulane's unexpended plant funds.

#### Outstanding Indebtedness

Tulane had outstanding, as of June 30, 1974, indebtedness amounting to \$14,380,000, evidenced by 10 bond issues and various notes. The 10 bond issues, which were outstanding in the aggregate principal amount of \$13,917,000, are owned by the United States Department of Housing and Urban Develop-

ment and, in the case of one such bond issue, by an insurance company. Such bond issues are general obligations of Tulane, secured by first mortgages on the facilities constructed and additionally secured by pledges of the revenues of such facilities or by student fees set aside for purposes of such pledges. Certain information regarding such bond issues is set forth below:

<u>Bond Issue</u>	<u>Amount Issued</u>	<u>Amount Retired</u>	<u>Amount Outstanding</u>
First Mortgage Dormitory Bonds of 1953 (Irby, Phelps and Johnston), 3.01% serial bonds maturing annually to 1992	\$ 1,735,000	\$ 680,000	\$ 1,075,000
University Center First Mortgage Bonds of 1956, 2 3/4% - 2 3/4% serial bonds maturing annually to 1996	1,800,000	502,000	1,298,000
First Mortgage Dormitory Bonds Series A of 1957 (Doris Hall), 2 3/4% serial bonds maturing annually to 1997	560,000	153,000	407,000
Student and Faculty Apartment Housing System Bonds, Series A, 1957, 3% - 2 3/4% serial bonds maturing annually to 1997	1,580,000	655,000	1,725,000
Student Infirmary Bonds of 1958, 2 3/4% serial bonds maturing annually to 1998	250,000	63,000	187,000
Dormitory System Bonds Series B, 1958, 3% serial bonds maturing annually to 1998	2,100,000	315,000	1,585,000
First Mortgage Building Bonds Series 1960, 3 1/2% serial bonds maturing annually to 1993	1,100,000	210,000	890,000
Dormitory System Bonds Series 1961, 3 1/4%, 3 3/4% serial bonds maturing annually to 2001	4,220,000	645,000	3,375,000
Student Apartment Bonds Series 1964, 3 1/2% serial bonds maturing annually to 2004	2,100,000	175,000	1,925,000
Physical Science Building Bonds of 1970, 3% serial bonds maturing annually to 2000	1,250,000	-	1,250,000
<b>Total</b>	<u>\$17,515,000</u>	<u>\$3,598,000</u>	<u>\$13,917,000</u>

## TULANE MEDICAL CENTER

### History

In 1913 Tulane reorganized its Medical Department into the College of Medicine, which has evolved into the School of Medicine. The Division of Hygiene and Tropical Medicine, predecessor of the School of Public Health and Tropical Medicine, was created in 1958. In 1969 the Board of Administrators established the Tulane Medical Center, an expanded organizational structure designed to consolidate and provide all medical education, research, patient care and community services. The principal units of the Tulane Medical Center are the School of Medicine, the nucleus of such Center, the School of Public Health and Tropical Medicine, the Institute for Research in Health Services, the Delta Regional Primate Research Center, and the University Student Health Service (located at Tulane's main campus).

### Board of Governors and Executive Administration

The Tulane Medical Center is governed by a board of governors (the "Board of Governors"), which was created in 1967 by the Board of Administrators and acts within policies established by such Board of Administrators. The Board of Governors, which presently consists of 27 members appointed by the Board of Administrators for staggered five-year terms, is responsible for all procedures and activities affecting the operation of the Tulane Medical Center. The Board of Governors membership reflects a cross-section of business, industrial, professional and public interests.

In accordance with the Constitution of the Tulane Medical Center Board of Governors, established pursuant to a resolution of the Board of Administrators, the President of Tulane has appointed, after consultation

with the Board of Governors and approval by the Board of Administrators, a Vice President of Health Affairs. The Vice President for Health Affairs, who is also Chancellor of the Tulane Medical Center, is responsible to the Board of Governors for the general operation of the Tulane Medical Center and responsible to the President of Tulane for the conduct of those operations in accordance with the general policies and procedures of Tulane. As chief administrative officer, the Vice President for Health Affairs nominates to the Board of Governors prospective senior administrative officers for the five principal units of the Tulane Medical Center.

#### **School of Medicine**

The fully accredited School of Medicine offers a four-year Doctor of Medicine degree program. In addition, the School of Medicine's Division of Graduate and Postgraduate Medical Studies offers internship programs in medicine, pediatrics, obstetrics and gynecology, pathology, psychiatry and neurology, and surgery and residency programs in all major specialty areas. Enrollment in the School of Medicine currently numbers 965 students, including 48 interns and 327 residents who receive training and provide patient care services at the Tulane Medical Center and its affiliated hospitals.

Tulane reports that it received 6,235 applications for 148 available positions in the School of Medicine's 1974-75 freshman class. Students representing 30 states, including 73 students from the State of Louisiana, accepted 112 of the available positions.

The faculty of the School of Medicine, which is presently composed of 199 full-time physicians and professors assisted by 804 part-time physicians and scientists, is primarily responsible for the education of Tulane's medical students, house officers and fellows. Integral components of the medical education process are clinical and basic sciences research and the delivery of patient care through a clinical practice program. Each clinical department constituting a unit of the overall clinical practice program is headed by a full-time chief who is both a professor and the chairman of his respective academic department.

Tulane Medical Center has recently instituted a strict full-time clinical practice plan. Under such plan, all members of the School of Medicine faculty are required to confine their patient care delivery activities to Tulane Medical Center facilities. Fees and other income derived from patient care and related services go directly to the School of Medicine. Each faculty member is paid a salary derived from the practice plan income, various sponsored programs, and other Tulane funds. The majority of the School of Medicine's clinical practice will be performed in the University Hospital and Ambulatory Care Teaching Facility (see "The Project" hereinafter) upon its completion.

#### **Existing Facilities**

The School of Medicine occupies a full city block and consists of three units: the Hutchinson Memorial Building, the Libby Memorial Building, and the Burche-Corcum Memorial Building, which together consist of 510,000 gross square feet. These units, completed and occupied in 1930, 1954 and 1963, respectively, contain lecture rooms, a large auditorium, class and research laboratories, faculty and administrative offices, the medical library, the Tulane Clinical Care Center, and clinical and x-ray laboratories. A seven-level parking garage attached to the Libby Memorial Building accommodates 560 cars.

#### **University Hospital and Ambulatory Care Teaching Facility**

The University Hospital and Ambulatory Care Teaching Facility, which is more fully described hereinafter under "The Project", will, upon its completion, become an integral unit of the Tulane Medical Center. Hospital Management Corporation, a wholly-owned subsidiary of Hospital Affiliates, Inc. of Nashville, Tennessee ("Hospital Affiliates"), will manage the University Hospital and the Ambulatory Care Teaching Facility pursuant to a management contract with the Tulane Medical Center. Hospital Management Corporation has and will continue to provide development services during the planning, design and construction of the University Hospital and Ambulatory Care Teaching Facility. Thereafter, Hospital Management

Corporation will be responsible for all operating functions at the University Hospital and Ambulatory Care Teaching Facility, including, among others, purchasing, personnel, pharmacy, medical records, dietary and food services, nursing, communications, environmental health, housekeeping and plant maintenance, and fiscal affairs (third-party reimbursement, budgeting and reporting, and accounting). Hospital Affiliates, a New York Stock Exchange-listed company, reports that Hospital Management Corporation presently manages 24 non-profit, county, municipal and/or investor-owned hospitals and will begin managing six additional hospitals, including the Project, upon the completion of their respective construction. In addition, Hospital Affiliates reports that it presently operates, as owner or lessee, 27 hospitals and will begin operating two additional hospitals upon the completion of their respective construction.

#### **Affiliated Hospitals**

Charity Hospital, a 1,877-bed acute care hospital founded in 1737, is located adjacent to the Tulane Medical Center and presently serves as Tulane's principal teaching hospital. The use of the wards and clinics of Charity Hospital were given in perpetuity by the Legislature of the State of Louisiana to the teaching staffs of Tulane and Louisiana State Universities for the practical instruction of students in all their respective divisions of medicine and surgery. Tulane will continue to use Charity Hospital as a teaching facility after the Project has been completed.

The facilities of several other hospitals are also used by Tulane for special activities such as clinical clerkships, preceptorships and junior internships. The following New Orleans institutions are included in this supplementary group: Ochsner Foundation Hospital, Toussaint Infirmary, Veterans Administration Hospital, Southern Baptist Hospital, Crippled Children's Hospital, the Eye, Ear, Nose and Throat Hospital, Lakeside Hospital for Women and the U. S. Public Health Service Hospital. The following institutions located elsewhere in Louisiana are also included in this supplementary group: Veterans Administration Hospital, Huey P. Long Memorial Hospital, Lallie B. Kemp Charity Hospital, East Louisiana State Hospital, Southeast Louisiana State Hospital, Confederate Memorial Medical Center, and Shriners Hospital.

#### **Research Facilities**

Tulane operates four research centers. The Delta Regional Primate Research Center, a unit of the Tulane Medical Center, was established under the auspices of the National Institute of Health and is located on a 500-acre tract across Lake Ponchartraine from New Orleans. This center is dedicated to the use of non-human primates in a wide range of biomedical research programs. Research is conducted in the fields of anatomy, bacteriology, biochemistry, neurobiology, oncology, parasitology, reproductive physiology, urology, and virology.

The Tulane Riverside Research Laboratories, located at the 300-acre Hebert Center near Belle Chasse, Louisiana, provide special facilities for advanced research and graduate training in such areas as aerospace sciences, computer sciences, biotechnology, environmental biology, and developmental biology.

The School of Public Health maintains an overseas research unit, the International Center for Medical Research and Training at the Universidad del Valle, Cali, Colombia, where an interdisciplinary approach to research on the problems of ill-health is employed. Areas of specialized study pursued by Tulane faculty members have included epidemiology, microbiology, parasitology, tropical medicine, psychiatry, sociology, anthropology, biostatistics, and nutrition.

The Tulane University Computer Center is used as a problem-solving facility by students and researchers throughout Tulane. The School of Medicine's Division of Medical Computing Services has direct entry to an IBM 7044 computer via communication links between the Tulane Medical Center and the Tulane University Computer Center.

#### **THE PROJECT**

The Project consists of a site of approximately three acres and, to be located thereon, a new hospital and ambulatory care teaching facility (sometimes hereinafter referred to as the "University Hospital and Ambulatory Care Teaching Facility", the "University Hospital", or the "Ambulatory Care Teaching Facility"), and an adjacent parking facility (the "Parking Structure").

#### University Hospital and Ambulatory Care Teaching Facility

The seven-story single-building 310-bed acute care University Hospital and Ambulatory Care Teaching Facility, presently under construction, will contain approximately 425,000 gross square feet and be located on an entire city block in the City of New Orleans directly across Tulane Avenue from the existing Tulane Medical Center facilities. The inpatient functions of the University Hospital will be physically separated from the outpatient functions of the Ambulatory Care Teaching Facility by a core area which will contain mechanical rooms, vertical conveyance systems, lavatories, stairs and elevator lobbies.

The ground level will provide three areas of vehicular access to the new facilities. On the Ambulatory Care Teaching Facility side of the facility, the first level will contain the general business offices, administration, data processing, educational services lobby, recreational facilities, canteen and dietary. The employees locker/lavatories, the trash and linen rooms, receiving office and security office will be located in the core. The emergency department, central service, supply, inpatient pharmacy, housekeeping, maintenance, morgue and autopsy equipment storage, bulk stores and the central boiler plant will be located on the University Hospital side of the facility. The mezzanine level on the Ambulatory Care Teaching Facility side will contain storage space for medical records, diagnostic services and the administrative offices and on the University Hospital side, general bulk storage areas.

The second level on the Ambulatory Care Teaching Facility side will contain the University Hospital and Ambulatory Care Teaching Facility medical records area, admitting and discharge, an outpatient pharmacy, coffee shop, Tulane Medical Center administrative offices and a gift shop. This floor will also contain a second level lobby with access provided by an elevated concourse across Tulane Avenue from the School of Medicine and an elevated concourse across La Salle Street from the Parking Structure. The pathology and related diagnostic laboratories, radiology with twelve procedure rooms and an EKG unit, nuclear medicine, and a special procedures unit with two procedure rooms will be located on this level on the University Hospital side of the facility. The third level on the Ambulatory Care Teaching Facility side will contain occupational therapy, physical therapy, respiratory care, a testing area, student health clinic, ophthalmology clinic and otolaryngology clinic. The outpatient and inpatient surgery suite consisting of twelve operating rooms, a twelve-bed recovery unit, a labor and delivery unit with two delivery rooms, and a fifteen-bed intensive care unit will be located on the University Hospital side.

The fourth level on the Ambulatory Care Teaching Facility side will house the general medical and surgical outpatient clinics consisting of forty-five typical exam treatment rooms and three special exam treatment rooms. Located on the University Hospital side will be a sixteen-bed obstetrics postpartum unit, a twenty-basinet newborn nursery, an eight-bed coronary care unit, a two-bed renal dialysis unit and thirty-seven medical-surgical beds. The fifth level on the Ambulatory Care Teaching Facility side will contain the remaining outpatient medical surgical exam treatment areas with forty-five typical exam treatment rooms and four special exam treatment rooms. A fourteen-bed pediatric unit and sixty-two medical-surgical beds will be located on the University Hospital side.

The sixth level on the Ambulatory Care Teaching Facility side will house part of the clinical facilities of the department of psychiatry and neurology including the following sections: social psychiatry, psychological, behavioral lab, adult psychiatry, group therapy and child psychiatry. Seventy-eight medical-surgical patient care beds will be located on the University Hospital side. The seventh level on the Ambulatory Care Teaching Facility side will contain the remaining sections of the department of psychiatry and neurology including central administration, medical student administration and neurology. The Tulane Medical Center conference area consisting of a board room, two conference rooms, dining rooms and an exercise area will also be located on the Ambulatory Care Teaching Facility side. A psychiatric unit consisting of twenty-four closed-in beds and fifty-four psychiatric and medical-surgical swing beds will be located on the University Hospital side. There will be twenty-four semi-private patient rooms and thirty private patient rooms on this floor. An outdoor wall-enclosed patient recreational area will be located on the roof above the central core.

The University Hospital and Ambulatory Care Teaching Facility will be constructed with a structural steel framing system. The exterior finish materials will consist of brick and bronze glass with an aluminum window wall. The interior finish materials will include carpeting in all offices, conference rooms, waiting

areas and patient rooms and vinyl asbestos tile in all support and utility areas. All interior partitions will be constructed of metal studs with gypsum board and finishes as required. All major corridor wall will be finished with vinyl wall fabric and ceilings will be acoustical lay-in tiles using gypsum board in the patient rooms and a plaster finish as required in wet areas.

#### **Parking Structure**

The nine-story Parking Structure, designed to accommodate approximately 875 cars, will be located directly across La Salle Street from the University Hospital and Ambulatory Care Teaching Facility. The Parking Structure, which will contain approximately 22,770 gross square feet of sheltered-in lease space on the ground and mezzanine levels, will be connected to the University Hospital and Ambulatory Care Teaching Facility by an elevated pedestrian concourse across La Salle Street. The Parking Structure will be constructed of structural steel and finished with a brick and bronzed glass exterior.

#### **Design and Construction**

The Project facilities were designed by Gaudin Rowlett Scott, architects of Houston, Texas (the "Architects"), in association with August Perez and Associates, J. Buchanan Blitch and Associates, Inc., and Kessels, DiBoll, Kessels, each being architects of New Orleans, Louisiana.

The J. A. Jones Construction Company of Charlotte, North Carolina is the prime contractor for the general construction of the University Hospital and Ambulatory Care Teaching Facility and the Parking Structure. Raymond International, Inc. of Houston, Texas is the contractor for the foundations of the University Hospital and Ambulatory Care Teaching Facility and the Parking Structure. Orleans Materials and Equipment Company, Inc. of New Orleans, Louisiana is the contractor for the structural steel of the University Hospital and Ambulatory Care Teaching Facility and the Parking Structure. Cooper-Weir of Louisiana, Inc. of New Orleans, Louisiana is the contractor for the decking of the Parking Structure.

Each of these contractors and Tulane have entered into separate contracts which specify guaranteed maximum upset prices totaling \$35,825,500 for their respective construction. Each guaranteed maximum upset price constituting such total amount is subject to being increased by, among other things, changes in the scope of the construction or additional work ordered by Tulane.

Demolition work costing approximately \$67,000 has been completed. Contracts for the painting and landscaping of the University Hospital and Ambulatory Care Teaching Facility have been estimated by the Architects to total \$285,000. Purchase orders for owner-furnished fixed equipment costing \$2,037,500 have been placed by Tulane with various vendors. Contracts for the supplying of major movable equipment for the University Hospital and Ambulatory Care Teaching Facility have been estimated by the Architects, Tulane and Hospital Affiliates to total \$2,252,500.

Construction and other contract performance covered by each contract are guaranteed by 100% performance and labor and materials payment bonds provided by each contractor to Tulane. Construction of the University Hospital and Ambulatory Care Teaching Facility was begun in November, 1973 and is expected to be completed by July, 1976. Construction of the Parking Structure was begun in May, 1974 and is expected to be completed by January, 1976.

### ESTIMATED COSTS AND SOURCES OF FUNDS

The proceeds to be received from the sale of the Bonds (excluding accrued interest on the Bonds to the date of delivery which shall be deposited with the Trustee) shall be applied, together with certain other moneys, as follows:

	University Hospital	Ambulatory Care Teaching Facility	Parking Garage	Total
<b>ESTIMATED PROJECT COSTS</b>				
Land, including demolition	\$ 1,134,000	\$ 1,126,000	\$2 187,000	\$ 4,467,000
Buildings	6,912,300	4,100,000	3,263,000	14,277,500
Architects' and other professional fees	1,341,000	760,000	451,500	2,552,500
Fixed equipment	6,966,000	4,216,000	651,000	11,833,000
Owner-furnished and major movable equipment	3,185,000	1,125,000	—	4,310,000
Contingency	194,000	102,000	74,000	360,000
Interest financing costs	95,300	33,000	31,500	200,000
<b>Estimated Project Costs</b>	<b>\$19,838,000</b>	<b>\$11,482,000</b>	<b>\$6,680,000</b>	<b>\$38,000,000.00</b>
<b>ESTIMATED FINANCING COSTS</b>				
Debt Service Reserve Fund Requirement				\$ 3,970,725.00
Interest from January 1, 1975 to July 1, 1976				4,533,087.50
HEAL and Trustee administration fees during construction				257,000.00
Legal, consulting, financial printing and miscellaneous				313,000.00
<b>Estimated Financing Costs</b>				<b>9,095,812.50</b>
<b>ESTIMATED TOTAL COSTS</b>				<b>\$47,095,812.50</b>
<b>ESTIMATED SOURCES OF FUNDS</b>				
Principal amount of the Bonds				\$12,500,000.00
Premiums bid by purchasers of Bonds				1,340,932.40
Contribution from Tulane, estimated				6,477,610.10
Interest earned during construction, estimated				1,777,250.00
<b>ESTIMATED TOTAL SOURCES OF FUNDS</b>				<b>\$47,095,812.50</b>

Tulane has paid certain construction and other costs related to the Project from its own funds and from the proceeds of a short-term construction loan presently outstanding in the amount of \$4,000,000. Tulane will be reimbursed from Bond proceeds for such expenditures. The short-term construction loan will be repaid from such reimbursement at the closing of the Bond issue.

As set forth above under "ESTIMATED SOURCES OF FUNDS", Tulane will contribute approximately \$6,477,610.10 for the payment of certain costs of the Project. Such monies will be provided from the proceeds of a fund-raising campaign initiated in 1972 for the Project. Tulane reports that, as of November 1, 1974, \$11,673,000 had been pledged and \$3,215,000 (net of related fund-raising costs) had been collected. To ensure that adequate funds will be available for the payment of the costs of the Project, Tulane will deposit, simultaneously with the delivery of the Bonds \$3,615,000 into an escrow account (the "Escrow Account") created pursuant to an escrow agreement between Tulane and the Trustee. Thereafter, within 10 days after the end of each calendar month, Tulane will deposit into the Escrow Account all campaign pledges collected during such calendar month until there is on deposit in the Escrow Account an amount of money sufficient to complete the Project. All investment income earned on moneys on deposit in the Escrow Account will be retained and commingled therein. No moneys will be withdrawn from the Escrow Account until such time as the funds in the Project Acquisition Fund (defined in the Resolution) available for the payment of the costs of acquiring the Project have been exhausted and then only for the sole purpose of paying the costs required to complete the Project.

Due to the timing of certain campaign pledge collections and the projected timing of the need for moneys to construct the Project, Tulane has covenanted in the Lease to obtain, at or prior to the delivery of the Bonds, an irrevocable letter or line of credit in the amount of \$1,875,000 payable to or on the order of Tulane for the payment of certain of the costs of the Project. Such letter or line of credit will be obtained from a bank located in the City of New Orleans, Louisiana, and will be in form and substance satisfactory to the Authority. To the extent that monies are not available in the Escrow Account for the payment of the costs of the Project, Tulane may draw upon such letter or line of credit at such times and in such amounts as shall be necessary to complete the Project. Tulane has covenanted in the Lease that it will be responsible for the repayment to the lender of any principal so drawn down, any interest thereon and any other charges with respect to the letter or line of credit. Tulane reports that such repayment will be made from campaign pledges as collected or its own monies.

It should be noted that Bond proceeds and other available moneys are expected to exceed by more than \$2,000,000, the moneys projected in Appendix B hereto to be available for Project and other costs. This is due primarily to the fact that actual interest rates on the Bonds and the actual purchase price of the Bonds are more favorable than projected originally as contained in Appendix B hereto.

In addition, Tulane has covenanted in the Lease that, in the event monies in the Project Acquisition Fund or the Escrow Account or from the letter or line of credit are insufficient to pay all costs of the Project, it will pay from its own funds all such costs of the Project.

## THE BONDS

### Description of the Bonds

The principal amount of Bonds to be issued is \$37,300,000. The Bonds shall be dated July 1, 1974, and shall bear interest at the rates and mature in the amounts and on the dates set forth on the cover page of this Official Statement.

The principal or Redemption Price of and interest on the Bonds, unless registered other than to bearer, will be payable in lawful money of the United States of America at the principal office of the Trustee, the First National Bank of Commerce, New Orleans, Louisiana. The principal of Bonds registered as to principal shall be paid at the principal office of the Trustee and interest on Bonds registered as to both principal and interest shall be paid by the Trustee by draft or check mailed to the registered owner. The Bonds will be coupon Bonds in the denomination of \$5,000 registrable as to principal only or as to both principal and interest at the principal office of the Trustee. Such Bonds registered as to both principal and interest may be converted or reconverted to coupon Bonds at the request of the registered owner and at his expense.

### Redemption Prior to Maturity

The Bonds maturing on or before July 1, 1984, are not subject to redemption prior to maturity. The Bonds maturing after July 1, 1984, are subject to redemption prior to maturity, at the option of HEAL, or from the Redemption Fund established under the Resolution, on or after July 1, 1984, as a whole at any time, or in part from time to time on July 1, 1984, or on any interest payment date thereafter, in inverse order of maturity and within any maturity by lot or in any customary manner of selection as determined by the Trustee, and any such redemption shall be made at the applicable Redemption Price expressed below as a percentage of the principal amount plus accrued interest to the redemption date:

<u>Period During Which Redeemed</u>	<u>Redemption Price</u>
July 1, 1984 to June 30, 1986, inclusive .....	104%
July 1, 1986 to June 30, 1988, inclusive .....	103
July 1, 1988 to June 30, 1990, inclusive .....	102
July 1, 1990 to June 30, 1992, inclusive .....	101
July 1, 1992 and thereafter .....	100

The Bonds maturing on July 1, 2009, are required to be retired, in accordance with the schedule set forth hereinafter under "DEBT SERVICE SCHEDULE" on page 16, by redemption prior to maturity beginning

on July 1, 1995, and annually on each July 1 thereafter to and including July 1, 2008, by operation of the Sinking Fund Account as provided in Section 2.04 of the Series Resolution at the principal amount thereof (without premium) plus accrued interest to the redemption date. The Bonds to be so redeemed shall be selected by the Trustee by lot or in any customary manner of selection as determined by the Trustee.

**Additional Bonds**

As set forth in the Resolution, HEAL may issue, on a parity with the Bonds, additional Bonds: (1) to refund any one or more series of outstanding Bonds, (2) to complete the acquisition of the Project and to provide additional funds for the Debt Service Reserve Fund, and (3) to refund any of the outstanding Bonds. A more detailed description of the conditions pursuant to which HEAL may issue additional Bonds is set forth herein under "SUMMARY OF THE RESOLUTION" on pages 23 and 24.

**DEBT SERVICE SCHEDULE**

The following table sets forth, for each respective Bond Year ending June 30, the amounts required to be made available for the captioned purposes. The principal of the Bonds matures and the Sinking Fund Installments become due on July 1, one day following the close of the respective Bond Years listed.

<u>Bond Year Ending June 30</u>	<u>Principal of Bonds</u>	<u>Sinking Fund Installments</u>	<u>Interest on Bonds</u>	<u>Total Debt Service</u>
1975	—	—	\$1,318,362.50	\$1,318,362.50
1976	—	—	3,036,725 00	3,036,725 00
1977	—	—	3,036,725 00	3,036,725 00
1978	\$ 400,000	—	3,036,725 00	3,436,725 00
1979	600,000	—	2,998,725 00	3,598,725 00
1980	800,000	—	2,941,725 00	3,741,725 00
1981	1,000,000	—	2,863,725 00	3,863,725 00
1982	1,200,000	—	2,770,725 00	3,970,725 00
1983	1,240,000	—	2,656,725 00	3,896,725 00
1984	1,240,000	—	2,538,925 00	3,778,925 00
1985	1,240,000	—	2,421,125 00	3,661,125 00
1986	1,240,000	—	2,303,325 00	3,543,325 00
1987	1,240,000	—	2,210,325 00	3,450,325 00
1988	1,240,000	—	2,117,325 00	3,357,325 00
1989	1,240,000	—	2,024,325 00	3,264,325 00
1990	1,240,000	—	1,931,325 00	3,171,325 00
1991	1,240,000	—	1,838,325 00	3,078,325 00
1992	1,240,000	—	1,745,325 00	2,985,325 00
1993	1,240,000	—	1,652,325 00	2,892,325 00
1994	1,240,000	—	1,559,325 00	2,799,325 00
1995	—	\$1,240,000	1,466,325 00	2,706,325 00
1996	—	1,240,000	1,368,675 00	2,608,675 00
1997	—	1,240,000	1,271,025 00	2,511,025 00
1998	—	1,240,000	1,173,375 00	2,413,375 00
1999	—	1,240,000	1,075,725 00	2,315,725 00
2000	—	1,240,000	978,075 00	2,218,075 00
2001	—	1,240,000	880,425 00	2,120,425 00
2002	—	1,240,000	782,775 00	2,022,775 00
2003	—	1,240,000	685,125 00	1,925,125 00
2004	—	1,240,000	587,475 00	1,827,475 00
2005	—	1,240,000	489,825 00	1,729,825 00
2006	—	1,240,000	392,175 00	1,632,175 00
2007	—	1,240,000	294,525 00	1,534,525 00
2008	—	1,240,000	196,875 00	1,436,875 00
2009	1,260,000	—	99,325 00	1,339,225 00

**DEFINITIONS OF CERTAIN TERMS**

*The following are definitions of certain of the terms used in the Resolution, the Series Resolution or the Lease and hereinafter in this Official Statement:*

"Annual Administrative Fee" means the annual fee for the general administrative services of the Authority in the following amounts for the periods indicated.

<u>Lease Year Ending June 30</u>	<u>Amount</u>
1976 to 1980, inclusive .....	\$78,750
1981 to 1995, inclusive .....	\$26,250

"Bond Year" or "Lease Year" means a period of twelve (12) consecutive months beginning on July 1 in any calendar year and ending on June 30 of the succeeding calendar year.

"Debt Service Reserve Fund Requirement" means, as of any particular date of computation, an amount of money equal to the greatest amount required in the then current or any future Bond Year to pay the sum of: (i) interest on the Bonds payable on January 1 of such Bond Year and on July 1 of the next succeeding Bond Year, and (ii) the principal of the Bonds or the Sinking Fund Installment, as the case may be, payable on July 1 of the next succeeding Bond Year.

"Escrow Account" means the Escrow Account created in the Lease.

"Gross Receipts" means all receipts, revenues, income and other moneys received by or on behalf of the Institution from or arising out of its operation of the Project, including all rights to receive the same whether in the form of accounts receivable, contract rights or other rights, and the proceeds of such rights whether now owned or held or hereafter coming into existence; provided, however, that gifts, grants, bequests, donations and contributions designated or specified by the donor or maker thereof as being for certain specific purposes, as well as the income derived therefrom, may be excluded from Gross Receipts.

"Initial Administrative Fee" means the fee, payable from the Project Acquisition Fund to the Authority, for its initial services in regard to the Project in the amount of \$140,625.

"Lease" means the Lease and Agreement between the Authority and the Institution.

"Project" means a comprehensive health care center providing teaching, research, conference and administrative facilities together with parking and other support facilities ("Leased Facilities"), located in the City of New Orleans on the Institution's property ("Project Site") to be constructed and equipped by the Institution and sold (together with the Project Site) to the Authority and leased back to the Institution pursuant to the Lease, and consisting of the following:

- (1) A hospital and ambulatory care teaching facility designed as a seven story building with a structural steel framing system and an exterior of brick and bronze glass with an aluminum window wall containing approximately 426,165 gross square feet of space.
- (2) A multi-level parking structure providing parking space for approximately 875 vehicles and auxiliary medical center facilities linked with the hospital and ambulatory care teaching facility by an elevated pedestrian concourse connecting on the second level of each structure.

"Renewal and Replacement Fund Requirement" means an amount equal to \$1,500,000.

"Redemption Price", when used with respect to a Bond, means the principal amount of such Bond plus the applicable premium, if any, payable upon redemption thereof pursuant to the Resolution and the Series Resolution.

"Rental Payment Fund" means the Rental Payment Fund created pursuant to the Lease.

"Revenues" means all rents, fees, charges, rates and other income and receipts derived by or payable to the Authority or to the Trustee for the account of the Authority in respect of the Project, excluding the Annual Administrative Fee, the Initial Administrative Fee and reimbursements to the Authority for expenses incurred by the Authority.

"Series Resolution" means the Series Resolution relating to the Project adopted on July 3, 1974

"Sinking Fund Account" means the account in the Debt Service Fund created and established pursuant to Section 303 of the Series Resolution.

"Sinking Fund Installment" means the amount of money sufficient to redeem Bonds at 100% of the principal amount thereof in the amounts, at the times and in the manner set forth in Sections 203 and 204 of the Series Resolution

"Supplemental Resolution" means any resolution of the Authority amending or supplementing the Resolution, any Series Resolution of the Bonds adopted and becoming effective in accordance with the terms of the Resolution or Series Resolution.

"Trust Agreement" means the Trust Agreement establishing the Rental Payment Fund to be executed by and between the Institution and the Trustee and approved by the Authority—as provided for by the Lease.

#### SUMMARY OF THE RESOLUTION

*The following is a brief summary of certain provisions of the Resolution pertaining to the Bonds and the Project*

The Resolution authorizes bonds of the Authority to be issued for one or more projects at one or more installments in one or more series each such series to be authorized by a separate series resolution. *(Resolution, 2 02 and Article IX)*

The Series Resolution authorizes the Project, the issuance of the Bonds in the principal amount of \$37,500,000 and specifies the details of the Bonds *(Series Resolution Article II)*

Upon the receipt of the proceeds of the Bonds including accrued interest thereon the Authority shall make payments from such proceeds as follows: (i) a sum equal to the interest accruing on the Bonds from January 1, 1975 to and including June 30, 1976 shall be deposited in the Interest Account; (ii) the Debt Service Reserve Fund Requirement shall be deposited in the Debt Service Reserve Fund, and (iii) the balance of the proceeds shall be deposited in the Project Acquisition Fund *(Series Resolution, Section 3 01)*

#### Establishment of Funds and Accounts

The following funds and accounts within funds shall be established, held and maintained by the Trustee, except the Operating Fund which shall be established, held and maintained by the Authority:

- Project Acquisition Fund
- Revenue Fund
- Operating Fund
- Debt Service Fund
  - Interest Account
  - Principal Account
  - Sinking Fund Account
- Debt Service Reserve Fund
- Renewal and Replacement Fund
- Redemption Fund

*(Resolution Section 3 01 and Series Resolution Section 3 03)*

#### Application of Moneys to the Project Acquisition Fund

The Authority shall pay from the Project Acquisition Fund the cost of the Project including the Initial Administrative Fee and necessary incidental expenses and approved reimbursements to the Institution.

Upon completion of the Project any balance then remaining in the Project Acquisition Fund not needed to pay any remaining costs shall be deposited by the Trustee in the Principal Account or the Debt Service Fund *(Resolution Section 3 03 and Series Resolution Section 3 02)*

#### **Allocation of Revenues**

Except as otherwise provided by the Lease, the Revenues received pursuant to the Lease and any other moneys which, by any provisions of the Resolution and Series Resolution, are required to be deposited in the Revenue Fund, shall be promptly paid to the Trustee for deposit to the credit of the Revenue Fund.

Subject to Section 3.06 of the Resolution, moneys in the Revenue Fund (attributable to each semi-annual period ending on December 31 or June 30, as the case may be) shall be paid by the Trustee on or prior to the fifth (5th) business day after deposit thereof as follows and in the following order of priority:

*First:* To the Interest Account, the amount, if any, necessary to make the amount on deposit therein equal to the interest becoming due on the Bonds on the next succeeding semi-annual interest payment date of the Bonds;

*Second:* To the Principal Account or Sinking Fund Account, as the case may be (i) in the case of moneys deposited in the Revenue Fund during the period ending December 31 of each Bond Year, the amount, if any, necessary to make the amount on deposit in the Principal Account or Sinking Fund Account, as the case may be, equal to one-half of the principal or Sinking Fund Installment, as the case may be, becoming due on the next succeeding July 1; and (ii) in the case of moneys deposited in the Revenue Fund between January 1 and June 30 of each Bond Year, the amount, if any, necessary to make the amount on deposit in the Principal Account or Sinking Fund Account, as the case may be, equal to the principal amount of Bonds maturing or Sinking Fund Installment, as the case may be, becoming due on the next succeeding July 1;

*Third:* To the Debt Service Reserve Fund, an amount equal to the amount, if any, necessary to make the amount on deposit therein equal to the Debt Service Reserve Fund Requirement;

*Fourth:* To the Renewal and Replacement Fund beginning December 30, 1980, the sum of \$75,000 and an amount equal to one-half the amount withdrawn from the Renewal and Replacement Fund in accordance with Section 3.09(b) of the Resolution until the amount on deposit is equal to the Renewal and Replacement Fund Requirement;

*Fifth:* To the Renewal and Replacement Fund, commencing on the date on which the amount on deposit therein equals the Renewal and Replacement Fund Requirement, one-half of the amount, if any, necessary to make the amount on deposit in the Renewal and Replacement Fund equal to the Renewal and Replacement Fund Requirement; and

*Sixth:* To the Authority, so long as the Institution is in possession of the Leased Facilities in accordance with the Lease, such amounts as are payable to the Authority for: (a) any expenditures of the Authority for insurance, fees, and expenses of auditing, and fees and expenses of the Trustee, all required by the Lease and not otherwise paid or provided for by the Institution; (b) all other expenditures reasonably and necessarily incurred by the Authority by reason of its financing of the Project, including expenses incurred by the Authority to compel full and punctual performance of all the provisions of the Lease in accordance with the terms thereof; and (c) one-half the Annual Administrative Fee unless otherwise provided—all unless otherwise paid but only upon receipt by the Trustee from the Authority of a certificate signed by an Authorized Officer of the Authority, stating in reasonable detail the amounts payable to the Authority pursuant to this paragraph *Sixth*.

After making the payments required above, any balance remaining in the Revenue Fund on June 30 and December 31 of every Bond Year shall be deposited to the credit of the Redemption Fund.  
(*Series Resolution, Section 3.03*)

#### **Allocation of Revenues Upon Re-entry of the Project**

If for any reason the Authority shall re-enter the Project, the Revenues received from the Project by the Authority during each calendar month shall be paid over by the Authority to the Trustee as soon as practicable for deposit to the credit of the Revenue Fund. Moneys so deposited in the Revenue Fund shall be paid by the Trustee on or prior to the tenth (10th) business day after deposit thereof as follows and in the following order of priority:

*First* To the Authority, for deposit in the Operating Fund for the Project, the sum certified as sufficient to cover Operating Expenses for the Project until the Authority shall have adopted a budget of Operating Expenses for the Project as required by Section 610 of the Resolution, but only upon receipt by the Trustee from the Authority of a certificate signed by an Authorized Officer of the Authority stating that the Authority has re-entered the Project and certifying the amount sufficient to cover Operating Expenses until the Authority shall have adopted a budget of Operating Expenses as required by Section 610 of the Resolution, and thereafter to the Authority for deposit in the Operating Fund the amount stated in such budget of Operating Expenses applicable to the month in which payment is made by the Trustee.

*Second* To the Debt Service Fund for the Project to be credited to the Interest Account, an amount equal to one-sixth of the interest becoming due on the Series of Bonds for the Project on the next succeeding semi-annual interest payment date of such Bonds, except to the extent that an amount representing such interest is on deposit in such Fund.

*Third* To the Debt Service Fund for the Project to be credited to the Principal Account and/or the Sinking Fund Account an amount equal to one-twelfth of the principal amount or Sinking Fund Installment becoming due on the Series of Bonds for the Project on the next succeeding annual maturity date or Sinking Fund Installment Payment Date of such Bonds.

*Fourth* To the Debt Service Reserve Fund for the Project, the amount, if any, necessary to make the amount on deposit therein equal to the Debt Service Reserve Fund Requirement, and

*Fifth* To the Renewal and Replacement Fund for the Project the amount, if any, necessary to make the amount on deposit therein equal to the Renewal and Replacement Fund Requirement.

Any balance remaining in the Revenue Fund for the Project at the expiration of any month when this Section is in effect shall be retained in such Revenue Fund for use in making the payments hereinabove set forth in the succeeding months. (*Resolution Section 306*)

#### **Application of Moneys in Funds**

The allocation of the moneys in the Revenue Fund to certain other Funds is set forth hereinbefore under 'Allocation of Revenues' and 'Allocation of Revenues Upon Re-entry of the Project'. The application of the moneys in such other funds is as follows:

##### **Application of Moneys in the Debt Service Fund**

The Trustee shall on each interest payment date pay out of the Interest Account the interest due on the Bonds and any amounts required for the payment of accrued interest upon any redemption or purchase of the Bonds. The Trustee shall on each July 1 pay out of the Principal Account or Sinking Fund Account as the case may be the principal amount or Sinking Fund Installment as the case may be due on the Bonds. (*Resolution, Section 307*)

##### **Application of Moneys in the Debt Service Reserve Fund**

If on any interest payment date the amount in the Interest Account shall be less than the amount of interest then due on the Bonds or if on any principal maturity date or Sinking Fund Installment Payment Date the amount in the Principal Account or Sinking Fund Account as the case may be shall be less than the amount of the principal or Sinking Fund Installment as the case may be of the Bonds then due the Trustee forthwith shall transfer moneys from the Debt Service Reserve Fund first to the Interest Account and second to the Principal Account or Sinking Fund Account as the case may be to the extent necessary to make good the deficiency or deficiencies as the case may be. (*Resolution Section 308*)

##### **Application of Moneys in the Redemption Fund**

If the amount in the Debt Service Reserve Fund is less than the Debt Service Reserve Fund Requirement the Trustee shall transfer from moneys in the Redemption Fund (other than moneys required to pay the Redemption Price of any Bonds then or hereafter called for redemption and moneys required for the purchase of

Bonds (therefore contracted to be purchased) to the Debt Service Reserve Fund the amount, to the extent available, necessary to make the amount on deposit therein equal to the Debt Service Reserve Fund Requirement.

Subject to the provisions described in the preceding paragraph, moneys in the Redemption Fund shall be applied by the Trustee to the purchase of Bonds at prices not exceeding the Redemption Price applicable on the next interest payment date on which such Bonds are redeemable, plus accrued interest due, in such manner as the Authority may direct. If 75 days prior to any interest payment date on which Bonds are subject to redemption, moneys in excess of \$50,000 shall then remain in the Redemption Fund, the Trustee shall apply such moneys to the redemption of the Bonds. (Resolution, Section 5.10)

#### **Application of Moneys in the Renewal and Replacement Fund**

If the amount in the Debt Service Reserve Fund is less than the Debt Service Reserve Fund Requirement and such deficiency cannot be made good by transfer of moneys from the Redemption Fund, the Trustee shall transfer from moneys in the Renewal and Replacement Fund to the Debt Service Reserve Fund the amount necessary to maintain the Debt Service Reserve Fund Requirement.

Subject to the provisions described in the preceding paragraph, moneys in the Renewal and Replacement Fund shall be applied to defray the extraordinary costs of maintaining, repairing, replacing, renovating and improving the Project and its equipment and to the repair and replacement of damaged property of the Project. (Resolution, Section 5.09)

#### **Application of Moneys in the Operating Fund**

Moneys in the Operating Fund shall be used only for the payment by the Authority of the Operating Expenses of the Project. The Authority covenants that, for the period from the date on which the Authority re-enters the Project to the beginning of the first month for which a budget of Operating Expenses has been prepared, such payments shall not exceed the actual Operating Expenses incurred by the Authority. The Authority further covenants that, for the first month included in a budget of Operating Expenses and for every month thereafter, such payments for any such month shall not exceed the amount provided for Operating Expenses of the Authority for such month. (Resolution, Section 5.11)

#### **Investment of Moneys**

Moneys in any of the funds and accounts established pursuant to the Resolution may be invested by the Trustee as shall be directed by the Authority in the following (with the exception of moneys on deposit in the Interest Account, Principal Account or Sinking Fund Account of the Debt Service Fund which must be invested in obligations of or guaranteed by the United States of America):

(i) obligations of or guaranteed by the State of Louisiana or the United States of America;

(ii) obligations issued or guaranteed by any instrumentality or agency of the United States of America, whether now existing or hereafter organized);

(iii) interest-bearing deposits in any bank or trust company (which may include the Trustee), provided that all such deposits shall, to the extent not insured, be collaterally secured in the manner required by the Act or the Laws of Louisiana for the securing of such deposits;

and only as follows:

(iv) moneys in the Interest Account, Principal Account or Sinking Fund Account of each Debt Service Fund only in obligations maturing or redeemable at the option of the holder in such amounts and on such dates as may be necessary to provide moneys to meet the payments from such Accounts;

(v) moneys in the Debt Service Reserve Fund only in obligations maturing or redeemable at the option of the holder not later than the last maturity date of the Bonds; provided, however, that at all times not less than twenty-five percent (25%) of the amount held in such Debt Service Reserve Fund shall consist of cash and obligations of or guaranteed by the State of Louisiana or the United States of America or any agency or instrumentality of the United States of America maturing or redeemable at the option of the holder not later than five (5) years from the date of purchase thereof;

(vi) moneys in the Renewal and Replacement Fund only in obligations maturing or redeemable at the option of the holder not later than three (3) years from the date of purchase thereof;

(vii) moneys in the Redemption Fund only in obligations maturing or redeemable at the option of the holder not later than the next-succeeding interest payment date on which Bonds are subject to redemption; and

(viii) moneys in the Project Acquisition Fund only in obligations maturing or redeemable at the option of the holder not later than two (2) years from the date of purchase thereof.

Interest earned, profits realized and losses suffered by reason of any investment shall be credited or charged, as the case may be, to the fund or account for which such investment shall have been made.

The Trustee or the Authority, as the case may be, may sell or redeem any such obligations in which moneys shall have been invested to provide cash in the respective funds or accounts as required. *(Resolution, Section 3.13 and Series Resolution, Section 3.01)*

#### **Deficiencies and Surpluses in Funds**

For the purposes of remedying any deficiency in the Debt Service Reserve Fund or in the Renewal and Replacement Fund or for transferring surpluses from such Funds to the Revenue Fund, the Resolution provides that (i) a "deficiency" shall mean (a) in the case of the Debt Service Reserve Fund, that the amount on deposit therein is less than the Debt Service Reserve Fund Requirement, and (b) in the case of the Renewal and Replacement Fund (but only after the Bond Year in which the amount therein first equals the applicable Renewal and Replacement Fund Requirement), that the amount on deposit therein is less than the Renewal and Replacement Fund Requirement, and (ii) a "surplus" shall mean (a) in the case of a Debt Service Reserve Fund, that the amount on deposit therein is in excess of the Debt Service Reserve Fund Requirement, and (b) in the case of a Renewal and Replacement Fund, that the amount on deposit therein is in excess of the Renewal and Replacement Fund Requirement.

On July 1 in each Bond Year, the Trustee shall compute the value of the Debt Service Reserve Fund and the Renewal and Replacement Fund. If such computation indicates a surplus exists, the Trustee, as promptly as practicable after such computation, shall deposit the amount of any such surplus existing in the Debt Service Reserve Fund into the Project Acquisition Fund until the completion of the acquisition of the Project, and thereafter in the Principal Account, and the amount of any such surplus in the Renewal and Replacement Fund in the Redemption Fund. The Authority covenants that the amount of any deficiency existing, as of July 1 in any Bond Year, in the Debt Service Reserve Fund shall be included as a part of the rates, charges or payments due to the Trustee for the account of the Authority for the Bond Year immediately succeeding. *(Resolution, Section 3.13 and Series Resolution, Section 3.04)*

#### **Additional Bonds and Other Obligations**

In addition to the Bonds, the Authority may issue upon compliance with the conditions prescribed in Section 4.01(A) of the Series Resolution additional bonds by a series resolution to complete the Project and to provide additional funds for the Debt Service Reserve Fund, which additional bonds shall be entitled to the pledge of the Revenues made by the Resolution on a parity with the Bonds. Such series resolution shall state the amount of the proceeds of such additional bonds required to be paid to the Debt Service Reserve Fund to make the amount on deposit in such Fund equal to the Debt Service Reserve Fund Requirement after such additional bonds have been issued. *(Resolution, Section 2.04, Series Resolution, Section 4.01(A))*

Refunding bonds may be issued to refund any part of the Bonds in accordance with a series resolution authorizing such refunding bonds and upon compliance with the conditions set forth in Section 4.01(B) of the Series Resolution. *(Resolution, Section 2.03 and Series Resolution Section 4.01(B))*

So long as any of the Bonds shall be outstanding, the Authority shall not issue any bonds, notes or other evidences of indebtedness (other than the Bonds, additional completion bonds and refunding bonds) secured by any pledge or by other lien or charge on the Revenues or other moneys, securities or funds required to be held

or set aside or applied by the Authority or the Trustee, ranking prior to or on a parity with the lien and pledge created by the Resolution and the Series Resolution. (Resolution, Section 6.11)

#### **Covenants as to Revenues**

The Authority covenants that adequate provisions will be made to assure that the Revenues derived from the Project will be sufficient at all times: (i) to pay the principal of and interest on the Bonds as the same become due and payable; (ii) to make the payments required to the Debt Service Reserve Fund and the Renewal and Replacement Fund; and (iii) to pay the expenditures of the Authority incurred in relation to the Project.

The Authority further covenants that, in the event that for any reason the Authority shall re-enter the Project, the Authority shall, within 10 days of such re-entry, adopt a schedule of charges or fees for the use of the Project, which shall be fixed and revised from time to time. The Authority further covenants to collect such charges or fees or cause the same to be collected. The Authority further covenants that the moneys derived from such charges or fees shall be sufficient at all times: (i) to pay the principal of or Sinking Fund Installment, as the case may be, and interest on the Bonds; (ii) to pay the Operating Expenses of the Project; and (iii) to maintain the Debt Service Reserve Fund and Renewal and Replacement Fund at their respective requirements. (Resolution, Section 6.03)

#### **Particular Covenants by the Authority**

The covenants by the Authority relating to the adequacies of Revenues are summarized hereinbefore under "Covenants as to Revenues". As to certain other subjects the Authority covenants as follows:

##### **Enforcement of Duties and Obligations of the Institution**

The Authority shall take all legally available action to cause the Institution to fully perform all duties and acts and fully comply with the covenants of the Institution required by the Lease. (Resolution, Section 6.04)

##### **Operation and Maintenance**

The Authority shall operate, or cause to be so operated at such times as it is not in possession thereof, the Project properly and in a sound and economical manner and shall maintain, preserve and keep the same properly, or cause the same to be so maintained, preserved and kept, in good repair, working order and condition and shall from time to time make or cause to be made all necessary and proper repairs, replacements and renewals. (Resolution, Section 6.06)

##### **Alienation of Project**

The Authority shall perform all duties with respect to the Project required by law and the Lease, and shall not pledge, mortgage or otherwise dispose of any part of the Project necessary, desirable or useful for the operation and maintenance thereof except as permitted by the Resolution. (Resolution, Section 6.07)

##### **Insurance**

The Authority shall procure and maintain or cause to be procured and maintained the following insurance to the extent obtainable in respect of the Project: (i) fire, extended coverage, vandalism and malicious mischief insurance, not to exceed \$10,000 deductible, on the plant, structure, machinery, equipment and apparatus comprising the Project, in an amount not less than 80% of the replacement value thereof, exclusive of excavations and foundations, provided, however, that the inclusion of the Project under a blanket insurance policy or policies of the Institution insuring against such hazards in an amount aggregating at least \$55,000,000 shall be a complete compliance with the foregoing provisions; (ii) workmen's compensation insurance, disability benefits insurance and each other form of employee insurance required by law; (iii) insurance against loss from liabilities arising from bodily injury of persons or damage to the property of others, with limits of not less than \$1,000,000 per person and \$3,000,000 per accident or occurrence on account of injury of persons and \$500,000 per accident or occurrence on account of injury of the property of others; (iv) medical liability

insurance, to the extent reasonably obtainable, against claims arising from the professional services performed by the Institution, with limits of not less than \$1,000,000 with respect to injury or death to any one person and not less than \$3,000,000 with respect to injury or death to more than one person arising out of a single occurrence, (v) fidelity insurance, in such amounts and under such terms as shall be determined by the Authority and (vi) in the event that the Authority shall re-enter the Project, to the extent reasonably obtainable, use and occupancy insurance covering the loss of revenues attributable to the Project in such amount as will provide a recovery to the amount of such loss or revenues for not less than a period of two (2) years, provided, however, that such insurance may exclude the loss sustained by the Authority during the first fourteen (14) days of total or partial interruption of use. The proceeds of all property insurance policies shall either be (i) applied or caused to be applied by the Authority to the repair and replacement of the damaged property of the Project, or (ii) deposited by the Authority with the Trustee for payment into the Revenue Fund. The proceeds of any use and occupancy insurance policies shall be deposited by the Authority with the Trustee for payment into the Revenue Fund. (*Resolution, Section 608 and Series Resolution Section 603*)

#### **Accounts and Audits**

The Authority shall keep proper books of records and accounts (separate from all other records and accounts) in which complete and correct entries shall be made of its transactions relating to the Project, which shall be subject to the inspection of the Trustee or any Bondholder. The Authority shall cause such books and accounts to be audited annually within 90 days after the end of its fiscal year by a nationally recognized independent certified public accounting firm. (*Resolution, Section 609*)

#### **Budget of Operating Expenses**

In the event that for any reason the Authority shall re-enter the Project, the Authority shall prepare a budget of Operating Expenses made or to be made monthly for the balance of the Bond Year. The Authority further covenants that prior to the beginning of each Bond Year thereafter, the Authority shall prepare a budget of Operating Expenses made or to be made monthly for such Bond Year. (*Resolution, Section 610*)

#### **Amendments or Modifications of the Resolution**

The Authority may adopt at any time or from time to time a Supplemental Resolution (i) to add to the covenants and agreements of the Authority contained in the Resolution or the Series Resolution, other covenants and agreements thereafter to be observed, (ii) to surrender any right, power or privilege reserved to or conferred upon the Authority by the Resolution or the Series Resolution, and (iii) to confirm any pledge under and the subjection to any lien or pledge created or to be created by the Resolution or the Series Resolution of the Revenues derived from the Project. (*Resolution, Section 10 01*)

With the consent of the Trustee a Supplemental Resolution amending or supplementing the Resolution or the Series Resolution may be adopted curing any ambiguity or curing, correcting or supplementing any defect or inconsistent provisions contained in the Resolution or the Series Resolution or making such provisions in regard to matters or questions arising under the Resolution or the Series Resolution as may be necessary or desirable and not contrary to or inconsistent with the Resolution or the Series Resolution. (*Resolution, Section 10 02*)

With the consent of the holders of at least 66 2/3% in principal amount of all outstanding Bonds affected thereby, a Supplemental Resolution may be adopted modifying any of the provisions of the Resolution, the Series Resolution, or of the Bonds but no such supplemental Resolution shall be effective until after the filing with the Trustee of a certified copy of such Supplemental Resolution and unless approved or consented to by, or on behalf of Bondholders, as provided in the Resolution. No such modification may change any terms of redemption of the Bonds, due date of principal or interest on the Bonds or make any reduction in principal, Redemption Price or interest of any Bond without the consent of the affected bondholder, nor shall any modification of any rights or obligations of the Trustee be made without the assent of the Trustee. No Supplemental Resolution may be adopted, except with the consent of the Authority and the unanimous

consent of the bondholders reducing the percentage or consent of bondholders required for any modification (Resolution Sections 10 03, 10 04)

Provisions relating to meetings of bondholders, action by consent without meeting and amendments of the Resolution are set forth in Articles X and XI of the Resolution

#### **Events of Default and Remedies of Bondholders**

Events of default are set forth and defined in the Resolution. Such events of default include among other things: default in the payment of the principal or Redemption Price of any Bonds when the same shall become due and payable; default in the payment of an installment or interest when the same shall become due and payable and such failure shall continue for a period of 30 days; default in the due and punctual performance of the covenants, conditions, agreements and provisions contained in the Bonds or in the Resolution or the Series Resolution and continuance of such default for a period of 30 days after written notice shall have been given to the Authority by the Trustee. (Resolution Section 3 01)

Upon the happening and continuance of any event of default the Trustee may and upon the written request of the holders of not less than 25% in principal amount of the outstanding Bonds shall, declare the principal or all of the outstanding Bonds to be due and payable immediately upon the expiration of 30 days from the giving of such notice or acceleration. (Resolution, Section 3 02)

Upon the happening and continuance of any event of default the Trustee may, and upon the written request of the holders of not less than 25% in principal amount of the outstanding Bonds shall (upon receiving indemnity to its satisfaction) proceed to protect and enforce its rights and the rights of the holders of the Bonds by such suits, actions or special proceedings in equity or at law as the Trustee shall deem most effectual to protect and enforce such rights. (Resolution Section 3 03)

If at any time the moneys held by the Trustee shall not be sufficient to pay the principal of and interest on the Bonds as the same become due and payable such moneys, together with any moneys then available or hereafter becoming available for such purpose, shall be applied as follows:

First: To the payment of the costs of the Trustee including counsel fees, any disbursements of the Trustee with interest thereon and its reasonable compensation.

Second: To the payment of interest then due, in the order of the maturity of the installments or such interest, and if the amount available shall not be sufficient to pay in full any particular installment, then to the payment ratably, according to the amounts due on such installment, without any discrimination or preference.

Third: To the payment of the unpaid principal or any of the Bonds which shall have become due (other than Bonds called for redemption or contracted to be purchased for the payment of which moneys are held pursuant to the provisions of the Resolution) and if the amount available shall not be sufficient to pay such principal in full, then to the payment ratably according to the amounts of principal due without any discrimination or preference. (Resolution, Section 3 04)

No holder of any of the Bonds shall have any right to institute any suit, action or proceeding in equity or at law for the execution of any trust under the Resolution or for any other remedy under the Resolution unless such holder previously shall have given to the Trustee written notice of the event of default on account of which such suit, action or proceeding is to be instituted and unless also the holders of not less than 25% in principal amount of the outstanding Bonds shall have made written request to the Trustee after the right to exercise such powers or right of action as the case may be, shall have accrued and shall have afforded the Trustee a reasonable opportunity either to proceed to exercise the powers granted by the Resolution or to institute such action, suit or proceeding in its or their name; and unless also there shall have been offered to the Trustee reasonable security and indemnity against the costs, expenses, and liabilities to be incurred therein or thereby and the Trustee shall have refused or neglected to comply with such request within a reasonable time. (Resolution Section 3 07)

### SUMMARY OF THE LEASE

The Lease to be executed by the Authority and the Institution will be dated as of July 1, 1974, and provides for the acquisition of the Project by the Authority, the leasing of same to the Institution and the financing of the acquisition through the issuance of the Bonds. The transactions contemplated by the Lease will be consummated in the following manner. The Institution will convey the Project Site and all improvements constructed thereon to the Authority on the date of delivery of the Bonds and will acquire, construct and equip the Leased Facilities on the Project Site according to plans and specifications heretofore approved by the Authority and Institution.

The Institution will sell and convey the Leased Facilities in installments to the Authority at its actual cost. The total price to be paid by the Authority for the Project cannot exceed the amount available for acquisition purposes from the proceeds of the Bonds and deposited to the credit of the Project Acquisition Fund. If the monies in the Project Acquisition Fund are not sufficient to pay in full the Project costs, the Institution must provide the balance of the money needed to pay such costs from its general or other available funds and is obligated to convey to the Authority the Leased Facilities as such are constructed, attached or installed on the Project Site.

*The following is a brief summary of certain provisions of the Lease:*

#### **Term of the Lease**

The Lease shall become effective as an agreement upon its delivery, and the leasehold estate in the Project Site and in each other portion of the Project created by the Lease shall commence on the respective date of transfer to the Authority of the Project Site and each such other portion in accordance with Sections 2.1 and 2.4 of the Lease. Subject to the other provisions of the Lease (including particularly Section 7.4 thereof, which grants to the Institution an option to extend the term), the Lease shall remain in full force and effect until the date on which the principal or Redemption Price of and interest on the Bonds and any other costs of the Authority with respect to the Project shall have been fully paid or provisions for the payment thereof shall have been made as provided by the Resolution and the Series Resolution. (*Lease, Section 4.2*)

#### **Agreement for Benefit of Bondholders**

The Lease declares that the covenants and agreements on the part of the Institution and the Authority contained therein are for the benefit of the holders of the Bonds. (*Lease, Section 11.1*)

#### **Conveyance of the Project Site and Leased Facilities**

The Institution agrees that it will convey good and merchantable title to the Project Site to the Authority and will construct and install the Leased Facilities thereon. The Institution agrees to provide at its own expense opinions of title or policies of title insurance with respect to the Project Site satisfactory to the Authority (Sections 2.1 and 2.2 of the Lease), in accordance with the Lease, upon payment and discharge of the Bonds and all other obligations of the Authority relating to the Project and upon the Institution's fulfilling all requirements under the Lease, the Project, including the Project Site thereof, may be purchased by the Institution at nominal consideration. (*Lease, Sections 7.1, 7.2 and 7.3*)

The Authority and the Institution agree that: (i) the Authority shall, upon request of the Institution, grant or reconvey to the Institution such portion or portions of the Project Site, including rights in the air space above the Project and any other real property rights or interests necessary to enable the Institution to construct additions over or adjacent to the Project, to be used for hospital or other health related purposes which real property rights and interests shall include the right to tie into, connect with and utilize (to the extent that the same will not thereby be overloaded) all utility, electrical, plumbing and mechanical services and systems and existing elevators and other means of access and egress contained in the Project; provided that the Authority first determines after examination of detailed plans and specifications presented by the Institution showing such such addition, that the construction thereof will not impair the structural integrity of the Project nor unreasonably hinder its use for the purposes for which it was designed (which

determination shall not be unreasonably withheld or delayed) and provided further that such grant or reconveyance will not render the portion of the Project Site retained by the Authority (including the improvements thereon) in violation of any zoning or other applicable public laws; (ii) any such additions need not constitute a part of the Project even though physically connected thereto; (iii) any such additions to be so constructed by the Institution shall be carried out in such a manner so as to not interfere with the utility and operation of the Project and at all times the Project will be capable of separate operation for the purposes originally intended; (iv) any such additions shall be constructed and operated in a manner to as to comply with all laws and regulations of all governmental bodies having jurisdiction in the premises; (v) no such additions shall be made by the Institution until the Project has been completed or if the Institution is in default under any of the provisions of this Lease; and (vi) unless there is filed with the Authority and the Trustee a certificate of a management consultant of national reputation and experienced in the management of hospitals selected by the Institution and approved by the Authority, stating that the use of any such additions will not result in a reduction in the Gross Receipts reasonably anticipated to be derived from the Project, the income and revenues from any such additions shall constitute Gross Receipts under this Lease. The Authority and the Institution further agree that any such additions referred to in this Section may be made a part of the Project. (Lease, Section 3.1)

#### **Escrow Account**

In order to secure its obligation to pay all Project costs which are in excess of the available moneys in the Project Acquisition Fund, the Institution has agreed in the Lease to create an Escrow Account (to be held by the Trustee) and to pay and transfer therein certain specified cash and receipts from pledges. Under the provisions of the Lease, the moneys in the Escrow Account are impressed with a security interest in favor of the Authority and the Trustee to pay the Project costs in excess of the amounts available for such purpose in the Project Acquisition Fund. (Lease, Section 3.6)

#### **Trust Agreement; Rental Payment Fund; Security for Payment of Rentals**

In order to insure that the rentals and other payments under the Lease will be made promptly and as security for the payment of the same, the Institution agrees to create with the Trustee pursuant to the Trust Agreement between the Institution and the Trustee a special fund designated the Rental Payment Fund to be held in the custody of the Trustee separate and apart from all funds and accounts of the Institution and the Trustee. The Trust Agreement shall be in form satisfactory to the Authority and shall become effective upon the written approval thereof by the Authority evidenced by the signature of the Executive Director or any authorized officer of the Authority. The Trust Agreement shall include, among other things, at least the following provisions, all consistent with and in accordance with the Lease: provisions with respect to the Rental Payment Fund, and provisions with respect to receipt, holding, custody, investment, payment and disposition of moneys paid into the Rental Payment Fund.

The Institution further agrees that beginning on the first business day of each month of each Lease Year it shall make payments from all Gross Receipts (or from its general funds prior to the time the Project is completed and becomes revenue producing and thereafter to the extent Gross Receipts are insufficient therefor) to the Trustee for deposit in the Rental Payment Fund so that by the 20th day of each such month the moneys so deposited in the Rental Payment Fund for such month will equal one-sixth (1/6) of the rentals due under the Lease on December 20 or June 20, as the case may be. Subject to the provisions of the preceding sentence with respect to payments from its general funds, the Institution further agrees that the amount of such Gross Receipts sufficient to make the foregoing rentals and payments required by the Lease shall be paid monthly by the Institution to the Trustee for deposit in the Rental Payment Fund whether or not any patient or occupant of the Institution is delinquent in the payment of his fees, rentals or other charges owed to the Institution, whether or not any patient or occupant receives either partial or total reimbursement as a credit against such payment, and whether or not the Institution receives either partial or total reimbursement as a credit against such payment. As security for its obligations to make payments to the Trustee, the Institution grants to the Authority a first lien on all Gross Receipts. If a required monthly payment is not made when due, any Gross Receipts subject to this first lien which are then on hand and not yet commingled

with other funds of the Institution and not yet deposited in a bank account of the Institution, and any such Gross Receipts thereafter received, shall not be so commingled or deposited but shall immediately, or upon their receipt, be transferred to the Trustee to the extent needed to make the required monthly payment. Moneys on deposit in the Rental Payment Fund shall, at the written request of the Institution, be invested by the Trustee in one or more of the following, provided such investments mature or are redeemable in such amounts and on such dates as may be necessary to enable the Trustee to make the withdrawals and payments prescribed by Section 4.6 of the Lease:

- (i) obligations of or guaranteed by the United States of America;
- (ii) obligations issued or guaranteed by any instrumentality or agency of the United States of America;
- (iii) interest-bearing deposits in any bank, trust company or national banking association having a capital and surplus aggregating at least \$10,000,000 (which may include the Trustee) provided that all such deposits shall, to the extent not insured, be collaterally secured in the manner required by the Act or the Laws of Louisiana for the securing of such deposits.

The interest or income earned by reason of any such investment shall be held in the Rental Payment Fund and applied as a credit towards subsequent payments to such fund. (*Lease, Section 4.5*)

#### **Covenant to Pay Rentals**

The Institution covenants and agrees to pay the rentals and payments required by the Lease (which rentals and payments are summarized hereinafter under the heading "Lease Rentals and Payments") from the Rental Payment Fund, and, if the moneys in such Fund are insufficient, then from the general funds or any other moneys available to the Institution in the manner and at the times provided by the Lease. The Institution further agrees to charge all persons using any facilities of the Project, fees, rentals or other charges which, together with its general funds and any other moneys legally available to it, shall provide moneys sufficient at all times: (i) to pay such rentals and payments required by the Lease; and (ii) to pay all other obligations of the Institution arising from the operation of the Project as the same become due and payable. (*Lease, Sections 4.4, 4.12 and 8.3*)

#### **Lease Rentals and Payments**

The obligations of the Institution to pay or cause to be paid the rentals payable under the Lease shall be complete and unconditional and the amount, manner and time of such rentals shall not be decreased, abated, postponed or delayed for any cause or by reason of the happening of any event. The rentals payable under the Lease are fixed at sums sufficient to pay: (i) the annual debt service on the Bonds, less any amount on deposit in the Debt Service Fund; (ii) the amounts required to establish and maintain the Debt Service Reserve Fund and the Renewal and Replacement Fund at the Debt Service Reserve Fund Requirement and at the Renewal and Replacement Fund Requirement, respectively, as required by the Resolution and the Series Resolution; (iii) any expenditures of the Authority for insurance, fees and expenses of auditing and fees and expenses of the Trustee; (iv) all other expenditures reasonably and necessarily incurred by the Authority by reason of its ownership, financing and leasing of the Project, including expenses incurred by the Authority to compel full and punctual performance of all of the provisions of the Lease; and (v) the Annual Administrative Fee. (*Lease, Sections 4.4 and 4.10*)

The Lease provides that the Institution shall pay or cause to be paid such rentals and other payments at such times and in such amounts that the payments required by the Resolution and the Series Resolution to the Rental Payment Fund shall be made at the times and in the amounts as required.

#### **Expenses Paid by the Institution**

The Institution agrees that it will, at its own expense, keep the Project, or cause the Project to be kept, in good repair and operating condition, loss by fire or other casualty, condemnation, ordinary wear and tear,

obsolescence and acts of God excepted, and make from time to time all necessary repairs to the Project and renewals and replacement thereof. The Institution further agrees to pay (i) all lawful taxes, governmental charges and assessments, general and special, if any, levied and assessed on or with respect to the Project during the term of the Lease; (ii) all water, sewer or other utility fees or assessments incurred in the operation or maintenance of the Project during the term of the Lease; and (iii) all gross receipts, profit, income and like taxes imposed or assessed against the Authority or against the Trustee by reason of any payments made under the Lease. (Lease, Sections 5.1 and 5.4)

#### **Covenant as to Insurance**

The Institution shall maintain with responsible insurers all insurance required by the Resolution and the Series Resolution and, in the event that the Institution fails to maintain such insurance, the Authority may procure and maintain such insurance at the expense of the Institution. The provisions relating to insurance are summarized hereinbefore under "Insurance". (Lease, Section 3.5)

#### **Termination of Lease by Authority**

If the Institution fails to make any rental payment when the same becomes due and payable, or if the Institution defaults in the observance or performance of any of the other provisions, agreements or conditions on its part to be observed or performed under the Lease, the Authority may, after giving proper notice as prescribed by the Lease, and if any Bonds are outstanding with the written consent of the Trustee, terminate the Lease and recover possession of the Project. No such termination shall relieve the Institution of any of its liabilities and obligations under the Lease and such liabilities and obligations shall survive such termination. (Lease, Sections 9.1 and 9.3)

#### **Tax Status**

The Institution agrees that (i) as of the date of the Lease, it is an organization described in Section 501(c)(3) of the Internal Revenue Code of 1954, as amended; (ii) it is exempt from Federal income taxes under Section 501(a) of such Code; (iii) it shall not perform any acts nor enter into any agreements which shall adversely affect such Federal income tax status of the Institution; and (iv) it shall not carry on or permit to be carried on in the Project or permit the Project to be used in or for any trade or business the conduct of which is not substantially related (aside from the need of such Institution for income or funds or the use it makes of the profits derived) to the exercise or performance by such Institution of the purposes or functions constituting the basis for its exemption under Section 501 of such Code. The Institution agrees that it will not take any action or permit any action to be taken on its behalf, or cause or permit any circumstance within its control to arise or continue, if such action or circumstance, or its expectation on the date of issue of the Bonds, would cause the interest paid by the Authority on the Bonds to be subject to federal income tax in the hands of the holders thereof. (Lease, Section 4.5)

#### **TAX EXEMPTION**

Messrs. Foley Judell Beck Bewley & Landwehr, Bond Counsel, are of the opinion that, under existing laws, regulations and judicial decisions, the interest on the Bonds is exempt from all federal income taxation, and the Bonds and the income thereon are exempt from taxation under the laws of the State of Louisiana.

#### **LEGALITY OF BONDS FOR INVESTMENT AND DEPOSIT**

Insurance companies, homestead associations and trust companies in the State of Louisiana may invest in the Bonds and the Bonds shall constitute legal investments for such funds. The Bonds may be used for deposit with any officer, department, board, commission, parish, municipality—except cities having a population of over 150,000 (New Orleans, Shreveport and Baton Rouge) or any department, board, commission or institution thereof—or other political subdivision of the State and any other public body or officer of any parish or municipality of the State in any case where deposit of security is required.

### NEGOTIABLE INSTRUMENTS

Pursuant to the Act, the Bonds are negotiable instruments, subject only to the provisions for registration of the Bonds.

### STATE OF LOUISIANA NOT LIABLE ON BONDS

Neither the State of Louisiana nor the Authority shall be obligated to pay the principal of or interest on the Bonds except from the revenues derived by the Authority from its ownership of the Project including the revenues received from Tulane under the Lease. Neither the faith and credit nor the taxing power of the State of Louisiana or any political subdivision thereof is pledged to the payment of the principal of and interest on the Bonds.

### LEGAL MATTERS

All legal matters incidental to the authorization and issuance of the Bonds by the Authority are subject to the approval of Messrs. Foley Judell Beck Bewley & Landwehr, Bond Counsel, whose approving opinion will be delivered with the Bonds.

There is not now pending any litigation, restraining or enjoining the issuance or delivery of the Bonds or questioning or affecting the validity of the Bonds or the proceedings and authority under which they are to be issued. Neither the creation, organization or existence, nor the title of the present members or other officers of the Authority to their respective offices is being contested. There is no litigation pending which in any manner questions the right of the Authority to acquire from, and lease back to, Tulane the Project in accordance with the provisions of the Act, the Resolution, the Series Resolution and the Lease.

### MISCELLANY

The references herein to the Act, the Resolution, the Series Resolution and the Lease are brief summaries of certain provisions thereof. Such summaries do not purport to be complete and reference is made to the Act, the Resolution, the Series Resolution and the Lease for full and complete statements of such and all provisions. The agreements of the Authority with the holders of the Bonds are fully set forth in the Resolution and the Series Resolutions, and neither any advertisement of the Bonds nor this Official Statement are to be construed as constituting an agreement with the purchasers of the Bonds. So far as any statements are made in this Official Statement involving matters of opinion, whether or not expressly so stated, they are intended merely as such and not as representations of fact. Copies of the documents mentioned in this paragraph are on file at the offices of the Authority.

Tulane has reviewed the information contained herein which relates to it and the Project and has approved all such information for use within this Official Statement.

The execution and delivery of this Official Statement by its Chairman have been duly authorized by the Authority.

HEALTH EDUCATION AUTHORITY OF LOUISIANA

By: /s/ REVILS O. ORTIGUE  
Chairman

**APPENDIX A**  
**and**  
**APPENDIX B**  
**Follow**

APPENDIX A

HASKINS & SELLS  
CERTIFIED PUBLIC ACCOUNTANTS

ELEVENTH FLOOR SOUTH  
INTERNATIONAL TRADE MART  
NEW ORLEANS, LOUISIANA 70120

ACCOUNTANTS' OPINION

The Administrators of the  
Tulane Educational Fund:

We have examined the balance sheet of Tulane University as of June 30, 1973 and 1972 and the related statements of current funds revenues, expenditures and other changes for the five years ended June 30, 1973 and of changes in fund balances for the two years ended June 30, 1973. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Amounts within certain categories of accounts in the accompanying financial statements differ materially (for the reasons referred to in Note 2 to the financial statements) from those as originally reported.

In our opinion, the above-mentioned financial statements present fairly the financial position of Tulane University at June 30, 1973 and 1972, its current funds revenues, expenditures and other changes for the five years ended June 30, 1973, and the changes in fund balances for the two years ended June 30, 1973, in conformity with generally accepted accounting principles. Such principles have been applied on a consistent basis after giving retroactive effect after December 18, 1973, to the changes, with which we concur, described in the said Note 2.

*Haskins & Sells*

December 13, 1973 (September 5, 1974  
with respect to the changes  
described in Note 2)

WYOMING UNIVERSITY

BALANCE SHEET  
JUNE 30, 1972 AND 1971

— ASSETS —	1972	1971
<b>CURRENT FUNDS:</b>		
Unrestricted:		
Cash.....	\$ 180,430	\$ 183,317
Temporary investments, at cost (market value, 1972, \$924,777; 1971, \$1,066,002).....	924,315	1,066,002
Inventories (at average cost).....	721,136	879,210
Due from unexpended plant funds.....	18,735	18,735
Due from endowment and similar funds.....	448,911	189,876
Accounts and accrued receivables.....	2,385,736	2,320,816
Deferred expenditures.....	256,800	691,889
Total unrestricted current funds.....	<u>3,197,782</u>	<u>3,091,845</u>
Restricted:		
Cash.....	39,732	10,347
Temporary investments, at cost (market value, 1972, \$229,447; 1971, \$130,464).....	282,302	130,464
Accounts receivable.....	1,188,108	1,270,784
Due from unrestricted current funds.....	2,996,252	3,181,683
Due from plant funds.....	612,393	712,795
Total restricted funds.....	<u>3,159,577</u>	<u>3,006,307</u>
Total current funds.....	<u>\$10,467,359</u>	<u>\$10,101,742</u>
<b>LOAN FUNDS:</b>		
Cash.....	\$ 833,123	\$ 392,384
Loans receivable.....	9,779,761	8,452,472
Total loan funds.....	<u>\$10,612,884</u>	<u>\$ 8,844,856</u>
<b>ENDOWMENT AND SIMILAR FUNDS (Note 1):</b>		
Due from plant funds.....	\$ 277,365	\$ 324,066
Due from annuity and life income funds.....	247,500	1,104
Stocks and bonds, at cost (market value, 1972, \$22,754,306; 1971, \$37,660,987).....	32,561,640	30,359,891
Real estate.....	6,271,776	6,183,543
Mortgage notes.....	700,983	764,682
Advances to plant funds.....	2,401,205	2,434,888
Advances to loan funds.....	40,000	89,887
Total endowment and similar funds.....	<u>\$42,400,399</u>	<u>\$40,791,977</u>
<b>ANNUITY AND LIFE INCOME FUNDS:</b>		
Cash.....	\$ 2,337	\$ -
Investments, at cost (market value, 1972, \$2,572,266; 1971, \$7,474,370).....	2,376,948	7,159,737
Due from endowment and similar funds.....	78,812	-
Total annuity and life income funds.....	<u>\$ 2,427,997</u>	<u>\$ 7,159,737</u>
<b>PLANT FUNDS (Note 1):</b>		
Unexpended plant funds:		
Cash.....	-	\$ 29,232
Stocks and bonds, at cost (market value, 1972, \$558,537; 1971, \$629,969).....	\$ 574,348	450,358
Real estate, at cost.....	4,202,800	3,439,318
Total unexpended plant funds.....	<u>4,777,148</u>	<u>3,999,308</u>
Funds for retirement of indebtedness:		
Cash.....	51,442	51,442
Revenue funds.....	5,000	5,000
Total funds for retirement of indebtedness.....	<u>56,442</u>	<u>56,442</u>
Investment in plant:		
Construction in progress.....	672,229	587,138
Land, buildings and equipment.....	85,634,887	83,577,548
Total investment in plant.....	<u>86,307,116</u>	<u>84,164,686</u>
Total plant funds.....	<u>\$91,160,505</u>	<u>\$88,216,834</u>
<b>AGENCY FUNDS:</b>		
Investments at cost.....	\$ 1,308	\$ 1,308
Due from restricted current funds.....	363,430	301,426
Total agency funds.....	<u>\$ 364,738</u>	<u>\$ 302,734</u>

See Notes to Financial Statements.

(Continued) - 1 -

**TULANE UNIVERSITY**

**BALANCE SHEET**  
**JUNE 30, 1972 AND 1971**

-- LIABILITIES AND FUND BALANCES --	1972	1971
<b>CURRENT FUNDS:</b>		
Unrestricted:		
Accounts payable and accrued liabilities.....	\$ 967,476	\$ 601,173
Due to restricted current funds.....	3,986,257	3,281,843
Deposits payable.....	515,436	476,461
Deferred revenues.....	892,249	820,322
Fund balance (deficit):		
Appropriated for encumbrances.....	799,741	339,406
Deficit.....	(464,302)	(423,948)
Total unrestricted current funds.....	<u>3,137,782</u>	<u>3,097,131</u>
Restricted:		
Due to agency funds.....	363,430	301,994
Fund balance.....	4,308,147	4,702,649
Total restricted current funds.....	<u>4,671,577</u>	<u>5,004,643</u>
Total current funds.....	<u>\$10,447,359</u>	<u>\$10,101,774</u>
<b>LOAN FUNDS:</b>		
Notes payable.....	\$ 87,500	\$ 87,500
Advances from endowment and similar funds.....	40,090	69,497
Student loan funds repayable to the United States		
Government.....	9,523,465	8,429,666
Restricted university funds.....	781,819	851,134
Total loan funds.....	<u>\$10,432,874</u>	<u>\$ 9,237,897</u>
<b>ENDOWMENT AND SIMILAR FUNDS (Note 2):</b>		
Notes payable.....	\$ 246,661	\$ 253,096
Due to annuity and life income funds.....	96,012	-
Due to unrestricted current funds.....	446,817	143,904
Unrestricted funds functioning as endowments.....	6,371,726	6,772,589
Endowment funds balances.....	<u>32,337,169</u>	<u>32,230,793</u>
Total endowment and similar funds.....	<u>\$42,620,395</u>	<u>\$40,299,879</u>
<b>ANNUITY AND LIFE INCOME FUNDS:</b>		
Due to endowment and similar funds.....	\$ 247,300	\$ 3,104
Annuities payable.....	743,260	184,572
Annuity fund balance.....	483,699	450,086
Life income fund balance.....	<u>1,443,038</u>	<u>1,521,394</u>
Total annuity and life income funds.....	<u>\$ 2,477,497</u>	<u>\$ 2,159,156</u>
<b>PLANT FUNDS (Note 2):</b>		
Unexpended plant funds:		
Accounts payable.....	\$ 118,204	\$ 34,197
Due to restricted current funds.....	812,982	310,763
Due to endowment and similar funds.....	277,261	234,866
Due to unrestricted current funds.....	3,483,374	151,424
Gifts payable.....	122,000	2,820,800
Restricted fund balance.....	<u>4,773,721</u>	<u>4,099,850</u>
Total unexpended plant funds.....	<u>\$ 6,586,242</u>	<u>\$ 7,550,860</u>
Funds for retirement of indebtedness:		
Bond and interest sinking funds.....	31,442	31,442
Revenue funds.....	<u>5,000</u>	<u>5,000</u>
Total funds for retirement of indebtedness.....	<u>\$ 36,442</u>	<u>\$ 36,442</u>
Investment in plant:		
Bonds payable.....	14,249,000	14,572,000
Notes payable.....	159,407	172,683
Advances from endowment and similar funds.....	2,401,205	2,424,688
Net investment in plant.....	<u>16,809,612</u>	<u>17,169,371</u>
Total plant funds.....	<u>\$23,362,105</u>	<u>\$24,316,673</u>
<b>AGENCY FUNDS:</b>		
Deposits held in custody for others.....	\$ 364,738	\$ 303,262
Total agency funds.....	<u>\$ 364,738</u>	<u>\$ 303,262</u>

See Notes to Financial Statements

(Continued) - 2.

YALE UNIVERSITY

STATEMENT OF CURRENT FUND REVENUES, EXPENDITURES AND OTHER CHANGES FOR THE FIVE YEARS ENDING JUNE 30, 1973

	1973	1972	1971	1970	1969
	RESTRICTED	RESTRICTED	RESTRICTED	RESTRICTED	RESTRICTED
<b>REVENUES:</b>					
<b>Educational and general:</b>					
Student tuition and fees	\$17,240,555	\$15,437,719	\$15,201,124	\$12,943,443	\$12,075,021
Research and other sponsored projects		\$15,437,719	\$15,201,124	\$12,943,443	\$12,075,021
Gifts and grants	2,891,774	3,070,747	1,092,325	4,269,279	3,600,493
Income from endowment investments	1,722,650	197,294	1,036,067	189,292	1,906,903
Research grant overhead allowances	2,187,459		1,998,976	1,045,099	2,117,065
Other	1,178,740		1,049,472	1,186,559	1,330,044
Total educational and general	24,229,178	19,513,720	22,478,108	19,722,519	20,957,006
Auxiliary enterprises	7,129,110		6,916,773	6,502,500	6,207,501
Total	31,358,288	19,513,720	29,394,881	26,225,019	27,164,507
<b>EXPENDITURES:</b>					
<b>Educational and general:</b>					
Instruction and departmental research	12,631,316	1,074,550	12,727,432	7,332,191	17,351,317
General expenses	4,122,314	660,725	2,043,371	494,274	3,480,248
Physical plant maintenance and operation	3,394,174		3,396,302		3,707,946
Research and other sponsored projects	290,768	15,454,204	206,418	15,304,122	331,750
Student aid	1,720,477	1,263,054	1,112,438	1,348,154	1,050,652
Libraries	1,282,002	198,435	1,372,074	743,378	1,339,766
Total educational and general	24,541,041	19,513,710	22,778,235	19,722,519	27,057,006
Auxiliary enterprises	6,703,614		6,640,475	6,652,921	5,209,121
Total	31,244,655	19,513,710	29,418,710	26,375,440	22,266,127
<b>UNUSUAL INTRAFUND TRANSFERS:</b>					
Gift principal and interest	(718,092)		(610,702)		(617,232)
Property insurance and replacement	(101,200)		(97,304)		(90,700)
Matching loans and related debt payments	(34,318)		(89,800)		(306,440)
Total	(853,610)		(797,806)		(1,014,372)
<b>EXCESS OF RESTRICTED FUND REVENUES AND EXPENDITURES OVER REVENUES</b>					
	(504,629)		(329,925)		(2,390,606)
<b>OTHER FUND BALANCE CHANGES:</b>					
Operating budget support	554,478		192,451		2,599,360
Auxiliary enterprises deficits			(430,907)		
Excess (deficiency) of restricted receipts over transfers to revenues		4,049,015			302,079
Reversal of restricted gifts		(883,681)			(111,451)
Other	1,504	240	107,091	179,099	15,210
Total	556,982	3,165,574	268,635	177,149	1,700,198
<b>NET INCREASE (DECREASE) IN FUND BALANCES</b>	<b>\$ (296,647)</b>	<b>\$ 351,860</b>	<b>\$ (521,071)</b>	<b>\$ (187,291)</b>	<b>\$ (320,408)</b>

See Notes to Financial Statements.

D-1-77

YALOW UNIVERSITY

STATEMENT OF CHANGES IN FUND BALANCES  
FOR THE TWO YEARS ENDED JUNE 30, 1972

	CURRENT FUNDS		LOAN FUNDS	MEDICARE AND SIMILAR FUNDS	AMBIENT AND LIFE INCOME FUNDS	PLANT FUNDS		
	UNRESTRICTED	RESTRICTED				EXPENSES	EQUIPMENT INVESTMENT	
<b>REVENUES AND OTHER ADDITIONS:</b>								
Unrestricted current funds revenues	\$29,456,555							
Gifts and grants		\$21,479,759	\$ 11,397	\$ 160,669	\$ 20,000	\$ 999,758		
Net investment gains (losses)				727,960		(16,465)		
Investment income		298,730	4,531			124,349		
Investment in plant facilities:								
Retirement of indebtedness								\$ 350,316
Expenditures for property and equipment								2,812,400
Natural annuity and life income funds restricted to endowment				120,820				
Other		70,815	1,738	169		176,365		10,845
<b>Total</b>	<b>29,456,555</b>	<b>21,800,994</b>	<b>17,647</b>	<b>1,729,626</b>	<b>20,000</b>	<b>1,132,602</b>		<b>3,273,909</b>
<b>EXPENDITURES AND OTHER DEDUCTIONS:</b>								
Current funds expenditures	29,388,711	19,722,519						
Indirect cost allowances		1,681,671						
Expended for plant facilities				183,904		1,721,315		
Interest expense						185,619		
Retirement of indebtedness								\$486,887
Loan cancellations			18,321					350,316
Natural annuity and life income funds restricted to endowment						120,820		
Gifts returned to donors		483,818						
Other			218			21,319		
<b>Total</b>	<b>29,388,711</b>	<b>21,989,000</b>	<b>19,122</b>	<b>183,904</b>	<b>120,820</b>	<b>1,927,124</b>		<b>847,203</b>
<b>INTRA-FUND TRANSFERS - Additions (Deductions):</b>								
Mandatory debt principal and interest	(810,787)					(37,680)		\$48,387
Mandatory property rentals and replacements	(97,304)			(294,326)		391,524		
Mandatory loans and related debt repayments	(89,888)		89,888					
Operating budget transfers	792,651			(792,651)				
Auxiliary enterprise deficit reimbursement	(490,297)					490,297		
Designation of restricted gifts		(480,845)				480,845		
Other - net	86,282	(87,968)		83,421		(83,345)		
<b>Total</b>	<b>(617,083)</b>	<b>(576,113)</b>	<b>89,888</b>	<b>(1,001,440)</b>		<b>1,251,321</b>		<b>\$48,387</b>
<b>NET INCREASE (DECREASE) FOR THE YEAR ENDED JUNE 30, 1972</b>	<b>(590,895)</b>	<b>(763,209)</b>	<b>68,526</b>	<b>44,292</b>	<b>(122,120)</b>	<b>563,798</b>	<b>1,184</b>	<b>3,273,909</b>
<b>FUND BALANCE (DEFICIT) - June 30, 1971</b>	<b>126,193</b>	<b>5,465,050</b>	<b>562,854</b>	<b>29,908,591</b>	<b>7,094,711</b>	<b>(746,364)</b>	<b>56,328</b>	<b>83,886,886</b>
<b>FUND BALANCE (DEFICIT) - June 30, 1972</b>	<b>\$ (423,846)</b>	<b>\$ 4,702,842</b>	<b>\$ 631,194</b>	<b>\$ 29,952,873</b>	<b>\$ 1,972,601</b>	<b>\$ (182,566)</b>	<b>\$ 57,512</b>	<b>\$ 86,980,805</b>

See Notes to Financial Statements.

(Continued) - 1.

YALE UNIVERSITY  
STATEMENT OF CHANGES IN FUND BALANCES, 1972

	CURRENT FUNDS		LOAN FUNDS	RESEARCH AND OTHER FUNDS	PENSION AND LIFE INCOME FUNDS	PLANT FUNDS		
	UNRESTRICTED	RESTRICTED				UNRESTRICTED	RESTRICTED	
<b>REVENUES AND OTHER ADJUSTIONS:</b>								
Unrestricted current funds revenues	\$31,657,694							
Gifts and grants		\$22,157,353	\$ 23,380	\$ 324,312	\$ 177,042	\$ 444,833		
Net investment gains (losses)				2,116,943	(813)			
Investment income		305,133	1,313			91,857		
Investment in plant facilities								
Retirement of indebtedness								337,000
Expenditures for property and equipment								2,424,250
Net annual and life income funds restricted to endowment				151,020				
Other		124,243		10,729	222	809		
<b>Total</b>	<b>31,657,694</b>	<b>22,586,731</b>	<b>24,691</b>	<b>2,593,324</b>	<b>176,269</b>	<b>537,699</b>		<b>2,761,250</b>
<b>EXPENDITURES AND OTHER ADJUSTIONS:</b>								
Current funds expenditures	\$1,272,404	\$3,513,710						
Indirect cost allowances		1,957,044						
Expended for plant facilities				267,947		1,234,314		
Interest expense						176,777		
Retirement of indebtedness								\$337,000
Loan cancellations			11,823					
Net annual and life income funds restricted to endowment					151,020			
Funds returned to donors		26,062						
Other				343	59,001			
<b>Total</b>	<b>1,272,404</b>	<b>5,497,716</b>	<b>11,823</b>	<b>268,290</b>	<b>211,021</b>	<b>1,411,091</b>		<b>337,000</b>
<b>INTER-FUND TRANSFERS - Adjustments (Deductions):</b>								
Revolving debt principal and interest	(778,491)					(37,000)		415,691
Revolving property rentals and replacements	(107,200)			(106,304)		213,504		
Revolving loans and related debt repayments	(96,378)		96,378					
Operating budget transfers	354,679			(534,679)				
Designation of restricted gifts		(685,465)		191,907		693,778		
Other - net	1,504	168	909	(4,328)		2,287		
<b>Total</b>	<b>(425,886)</b>	<b>(685,517)</b>	<b>97,547</b>	<b>(474,004)</b>		<b>672,049</b>		<b>415,691</b>
<b>NET INCREASE (DECREASE) FOR THE YEAR ENDING JUNE 30, 1973</b>	<b>(40,456)</b>	<b>307,490</b>	<b>110,625</b>	<b>1,856,042</b>	<b>(39,304)</b>	<b>(1,143)</b>	<b>(1,000)</b>	<b>2,761,250</b>
<b>FUND BALANCE (DEFICIT) - June 30, 1972</b>	<b>(423,841)</b>	<b>4,792,649</b>	<b>651,194</b>	<b>29,752,873</b>	<b>1,972,083</b>	<b>317,426</b>	<b>\$7,442</b>	<b>66,980,805</b>
<b>FUND BALANCE (DEFICIT) - June 30, 1973</b>	<b>(464,297)</b>	<b>5,099,147</b>	<b>761,819</b>	<b>31,608,915</b>	<b>1,932,779</b>	<b>316,283</b>	<b>\$6,442</b>	<b>69,742,055</b>

See Notes to Financial Statements.

TULANE UNIVERSITY

NOTES TO FINANCIAL STATEMENTS

1. ACCOUNTING POLICIES

Fund Accounting

The University employs the fund method of accounting in order to demonstrate the utilization of its resources in accordance with specified objectives and activities. These resources may be available for use in achieving any institutional purpose, or may be restricted either as a condition established by the source or through actions of the Board of Administrators. The fund method of recording and reporting transactions identifies the sources or purposes and indicates any restrictions.

Endowment funds are subject to gift instruments requiring, in perpetuity, that the principal be invested and the income, only, be utilized. Unrestricted funds functioning as endowments have been established by the University's Board of Administrators for the same purposes as endowment funds, but may be expended.

Accrual Basis

The accompanying financial statements have been prepared, generally, on the accrual basis except for the absence of property depreciation provisions and recognition of pledged gifts. Consequently, the statement of current funds revenues, expenditures, and other changes reflects the financial activities of the reporting period but does not purport to present results of operations or net income.

Investment Gains and Income

Endowment and similar funds share capital gains of the University's investment pool based upon the market value entry method. Investment income derived from pooled investments is distributed to certain restricted current funds at the rate of 4% per annum of the average fund balances of the respective endowment funds, and the remainder of such income is allocated to other current funds.

Real estate of the endowment and similar funds is stated at cost of purchase or estimated value at date of gift. No provisions for depreciation are made. It is the opinion of the University's management that the excess of realizable market value over the book value of such property would be sufficient to preclude the impairment of endowment fund balances even if appropriate provisions were made. This excess is considered sufficient to permit the distribution of rentals and royalties derived therefrom to the current funds.

(Continued) - 1.

### Gifts

Gifts are recognized in the accounts of the stipulated funds when received. Those released from restriction, or utilized to reimburse the unrestricted current funds for expenditures on behalf of restricted projects, are included in unrestricted current funds revenues.

At June 30, 1973 the records of the University indicated unrealized, pledged gifts of approximately \$6,300,000. Substantially all of the gifts were to be received over the succeeding five years and restricted to the medical center expansion program discussed at Note 5.

It is not considered practicable to estimate the net realizable value of unrealized, pledged gifts from all sources.

### Plant Fund Property

Physical plant and equipment is stated at cost or market value at date of gifts and does not reflect a provision for depreciation.

Current and unexpended plant funds expenditures include the cost of property additions excluding mandatory inter-fund transfers for property renewals and debt service.

### Grants and Sponsored Projects

Amounts derived from grants, research contracts, and other sponsored projects are recognized as related monies are received or services are rendered by the University.

The portion of these monies allowed for defrayal of overhead costs is included in unrestricted current funds revenues and in deductions from restricted current funds balances.

### Pension Plans

Substantially all of the University's employees participate in insured or other defined benefit pension plans.

No actuarial computation of the total costs of the non-insured, self-administered plans, based on services rendered, has been made; however, in the opinion of the University's management, the related, unrecognized liabilities would not be material relative to the University's financial position.

Payments to insured plans and retired employees are included in unrestricted current fund expenditures and are summarized below for the five years ended June 30, 1973:

	<u>Insured Plans</u>	<u>Retired Persons</u>
1973.....	\$1,909,000	\$60,000
1972.....	1,688,000	53,000
1971.....	1,579,000	52,000
1970.....	1,442,000	48,000
1969.....	1,310,000	46,000

(Continued) - 2.

**Inter-fund Transactions**

Inter-fund borrowings with specified maturity schedules exceeding one year and bearing interest at specified rates are designated as advances, while those to be liquidated currently and bearing no interest are grouped under the "due to/from" captions. Other transfers for operating budget support, debt service, etc. are recognized as permanent in the affected funds as they occur.

**2. ACCOUNTING CHANGES**

The AICPA Industry Audit Guide, Audits of Colleges and Universities (Audit Guide), which became effective for years beginning July 1, 1973, requires that advances from funds functioning as endowments to other fund groups should be recorded as permanent transfers unless there is expectation of repayment within a reasonable period of time. Such advances as of June 30, 1973 previously reported as assets of the endowment and similar funds (that portion attributable to unrestricted funds offset against unrestricted current fund balances) have been written off retroactively (as approved by the Board of Administrators on September 3, 1974) in the accompanying financial statements against fund balances. In connection with treatment of such transfers as permanent, the associated interest has been eliminated in the accompanying financial statements and unrestricted current funds expenditures and endowment income reduced as follows: 1973, \$1,092,540; 1972, \$1,035,669; 1971, \$1,268,394.

The financial statements also reflect the distribution of previously deferred construction and maintenance costs accumulated in the unrestricted current funds, largely on behalf of the funds functioning as endowments and plant funds.

Shown below are the net effects of these transfers on the fund balances materially affected:

	Funds Functioning as Endowments			Net Investment in Plant		
	1973	1972	1971	1973	1972	1971
Fund balances, as previously reported.....	\$29,857,204	\$30,084,095	\$29,628,184	\$41,616,339	\$59,119,103	\$54,137,930
Transferred to unrestricted current funds....	16,616,708	15,799,121	14,822,565			
Transferred to plant funds.....	7,668,770	7,352,385	7,268,166	8,104,964	7,960,902	7,268,166
Fund balances as restated.....	\$45,832,726	\$45,722,548	\$47,537,433	\$49,721,303	\$66,980,005	\$58,606,295

The Audit Guide also requires accrual of estimated liabilities to annuitants based upon their life expectancy and other factors. Annuity fund balances have, accordingly, been restated as follows:

	1973	1972	1971
Annuity and life income fund balances, as previously reported...	\$2,179,997	\$2,154,653	\$2,257,991
Less life income fund balances.....	1,443,038	1,371,393	1,043,056
Annuity fund balances.....	736,959	783,260	1,214,935
Less annuities payable.....	243,260	184,572	163,790
Annuity fund balances, as restated...	\$493,699	\$598,688	\$1,051,145

(Continued) - 3.

Other reclassifications and changes of format (none of which materially affect fund balances or net changes therein) have been made in order to reflect in the accompanying financial statements the accounting and reporting practices prescribed by the Audit Guide.

3. NOTES AND BONDS PAYABLE

Plant fund bonds payable consist of mortgage obligations maturing serially through 2003 with annual interest rates ranging from 2-7/8% to 5-7/8%. Revenues of dormitories and other student service facilities are pledged to debt service which is summarized below for the five years ended June 30, 1973:

1973.....	\$815,691
1972.....	848,307
1971.....	858,210
1970.....	970,798
1969.....	940,558

Plant fund notes payable consist of short-term and demand obligations bearing interest at rates ranging from 5% to 7%.

As of June 30, 1973 and 1972 securities of the unrestricted funds functioning as endowments having a cost of \$2,136,000 and \$2,383,983, respectively, were pledged as collateral for plant fund notes and bonds payable.

Loan fund notes payable bear interest at 5-1/2% per annum and mature serially through 1982. Notes payable of the endowment and similar funds bear interest at 3% per annum and mature serially through 1996. Both are collateralized by investments of the unrestricted funds functioning as endowments.

4. PLANT FUND PROPERTY

A summary of University plant is as follows:

	<u>1973</u>	<u>1972</u>
Construction in progress.....	\$ 672,228	\$ 582,228
Land.....	1,915,977	1,915,977
Buildings.....	59,421,973	58,988,024
Improvements.....	1,296,012	1,296,012
Equipment.....	23,220,725	21,377,135
Total.....	<u>\$86,526,915</u>	<u>\$84,159,376</u>

5. MEDICAL CENTER EXPANSION

In November 1973 the University commenced construction of a teaching hospital and related ambulatory care and parking facilities. Interim bank financing of this project bears interest at 1-1/4% above the prime rate, is repayable by 1979, and provides for a line of credit of \$32,000,000.

It is anticipated that the facilities will be transferred in a sale/lease-back arrangement to the Health Education Authority of Louisiana, a state agency issuing \$37,500,000 in tax-exempt bonds to finance its purchase. The bonds are to be collateralized by mortgages on the subject property and the revenues derived therefrom.

(Continued) - 4.

Rentals are to be sufficient to meet debt service, and upon liquidation of the bonds, title to the facilities shall revert to the University.

6. INTER-FUND ADVANCES

Advances from the endowment and similar funds to plant funds represent installment notes maturing between 1979 and 1994, bearing interest compounded annually at rates ranging from 2-1/2% to 4%. As of June 30, 1973 annual debt repayments of principal and interest ranged from \$174,204 through June 30, 1979 to \$127,659 in 1994.

7. ENDOWMENT AND SIMILAR FUNDS INVESTMENT PORTFOLIO

The results of the University's endowment and similar funds investment program for the years ended June 30, 1973 and 1972 are summarized below. For this purpose, the market values of real estate, mortgage notes, and inter-fund advances have been assumed to equal their book values.

Endowment and Similar Funds Investment Portfolio

	.....1973.....		.....1972.....		.....1971.....	
	Market Value	Book Value	Market Value	Book Value	Market Value	Book Value
Stocks and bonds.....	\$13,759,268	\$32,561,680	\$37,660,983	\$30,599,891	\$34,289,979	\$28,753,594
Real estate.....	6,371,778	6,371,776	6,185,943	6,185,943	6,374,910	6,534,910
Mortgage notes.....	700,883	700,883	704,082	704,082	852,138	852,138
Advances to plant funds..	2,401,205	2,401,205	2,434,668	2,434,668	2,467,223	2,467,223
Advances to loan funds..	40,090	40,090	69,697	69,697	69,762	69,762
Total.....	<u>\$23,273,162</u>	<u>\$42,075,634</u>	<u>\$47,114,985</u>	<u>\$40,053,883</u>	<u>\$44,294,062</u>	<u>\$38,722,677</u>

Investment Gains and Income

	.....1973.....			.....1972.....		
	Market Value	Book Value	Gain (Losses)	Market Value	Book Value	Gain (Losses)
Total portfolio - end of the year.....	\$23,273,162	\$42,075,634	\$ 1,197,328	\$47,114,985	\$40,053,883	\$7,061,102
Total portfolio - beginning of the year..	\$47,114,985	\$40,053,883	7,061,102	\$44,294,062	\$38,779,677	5,514,385
Unrealized gains (losses).....			(5,863,374)			1,346,717
Realized gains.....			2,116,943			927,968
Net investment gains (losses)....			(3,746,431)			2,474,685
Investment Income.....			2,927,799			2,127,397
Total.....			<u>\$1,171,368</u>			<u>\$4,602,082</u>

(Concluded) - 5.

TOUCHE ROSS & CO.

APPENDIX B

REPORT ON FINANCIAL FEASIBILITY STUDY  
FOR PROPOSED  
TULANE MEDICAL CENTER HOSPITAL,  
CLINICAL FACILITIES AND PARKING GARAGE  
September 30, 1974

D-1-85

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TOUCHE ROSS & CO.

14th FLOOR PEACHTREE CENTER SOUTH  
225 PEACHTREE STREET N.E.  
ATLANTA, GEORGIA 30303

September 30, 1974

The Administrators of the  
Tulane Educational Fund and  
The Board of Governors of  
Tulane Medical Center  
New Orleans, Louisiana

The accompanying Projected Statement of Revenues, Expense, and Changes in Unrestricted Fund Balances, Projected Statement of Changes in Financial Position, Projected Balance Sheet and Projected Statements of Changes in Fund Balances for the restricted funds were prepared to assist you and prospective bondholders in evaluating whether the operations of the proposed Tulane Medical Center (TMC) Teaching Hospital, Ambulatory Care Teaching Facility and Parking Garage, all to be a part of Tulane University, New Orleans, Louisiana, during the period of the projections, may be expected to support a proposed \$37,500,000 bond issue. The projections are based on the assumptions and rationale set forth on pages 18 through 35.

The proposed bonds will be issued by the Health Education Authority of Louisiana (HEAL) which will also administer the offering through a trustee bank recommended by the bond underwriter, with approval by the Authority. The proposed issue is intended to finance construction of a 310-bed teaching hospital, an ambulatory care teaching facility with 100 examination/treatment rooms and a parking garage with 875 spaces.

The hospital, to be staffed primarily with Tulane clinical faculty physicians, will be completely equipped to provide medical, surgical, obstetric, pediatric, psychiatric and intensive care inpatient services. It will also contain the necessary operating rooms, laboratories, radiology units and other ancillary and general support facilities to serve both the hospital and the ambulatory care teaching facility. The ambulatory care teaching facility will be used by TMC's full time faculty as an outpatient diagnostic and treatment clinic. The parking garage will be adjacent to the patient care facilities and will accommodate the needs of staff, patients and visitors.

The total estimated project cost is \$46,286,000 of which \$19,838,000 is to finance the hospital land, construction and equipment; \$11,492,000 is to finance the ambulatory care teaching facility land, construction and equipment and \$6,680,000 is to finance the parking garage land, construction and equipment. The remaining funds will be used for construction period interest (\$3,192,000), establishment of debt service reserves (\$4,149,000), and bond issuance expenses (\$945,000). The project is to be financed primarily from the proposed sale of tax-exempt revenue bonds totaling \$37,500,000. TMC plans to fund the balance of the project cost of \$8,786,000 from pledge collections (estimated to be \$7,225,000) and, to the extent required, from unsecured short-term bank borrowings (estimated to be \$1,561,000). Actual borrowings will depend on the timing of campaign pledge collections. Funds borrowed for this purpose will be repaid from the proceeds of future pledge collections as received or from cash provided from Tulane's own funds.

We have reviewed the assumptions and rationale underlying the financial projections individually and in the context of the projection taken as a whole. Our approach consisted of three major elements:

1. Assessing the medical service needs of the primary area in which TMC's proposed hospital and ambulatory care teaching facility would provide health care services.
2. Reviewing pertinent economic factors and the plans of other hospitals in the area to the extent they are expected to affect the potential success of the new facility's operations.

3. Reviewing the projected utilization rates for the proposed hospital and ambulatory care teaching facility.

Our review included the following procedures which we performed:

- Review of demand for inpatient and outpatient service programs.
- Review of demographic characteristics and population growth trends for the service area.
- Review of current and historical operating data for comparable medical centers and other area hospitals, and area-wide plans to meet future general medical care needs.
- Survey of the active faculty physicians to assess their support of the proposed new facility.
- Interviews of local health care agencies and planning authorities to assess support for the proposed facility and to identify other health care concerns and needs.
- Review of anticipated future demand for services based on population projections, patient usage statistics and patient care teaching requirements.
- Review of past and current TMC clinical care operations and the basis for projecting future levels of operations.
- Examination of third-party payor contracts and regulations.

Tulane University's lease obligation to HEAL constitutes a full faith and credit guarantee of the University. If the gross project receipts should be insufficient, Tulane

University will, under the terms of the lease, make necessary payments to meet the interest and principal requirements of the revenue bond issue. We did not examine the financial statements of Tulane University or any of its divisions and accordingly, we do not express an opinion on the financial condition of these entities. The financial projections in this report cover only the proposed TMC teaching hospital, ambulatory care teaching facility and parking garage as described.

TMC administration has begun a significant change in orientation of the faculty clinical practice, aimed at establishing the utilization levels required for the new hospital and ambulatory care teaching facility. In this regard, TMC has developed and initiated the following plans:

1. A strict full-time faculty practice plan, including all Tulane School of Medicine full-time faculty physicians, became effective July 1, 1974. Under this practice plan agreement, all professional revenue earned by the full-time faculty physicians will first be used to pay operating expenses and practice costs applicable to the ambulatory care teaching facility. Thereafter, these revenues will be available to meet faculty salary costs, incentive compensation and clinical departmental expenses. At the present time, 84 faculty members are participating in the plan.
2. A clinical faculty physician recruitment plan has been instituted, aimed at adding 14 additional physicians to the full-time faculty by 1976 and 12 more physicians between 1976 and 1980. This plan specifies that the new physicians will have a primary orientation to clinical practice. A total of 11 new positions have been authorized for fiscal year 1974-75. Candidates are currently being considered for these positions.
3. A number of potential service programs have been identified to augment the existing utilization levels, and negotiations have been initiated for implementation. TMC administration is planning to develop these service programs on a time-frame consistent with the development of the new facilities.

Financing of the proposed development program includes \$7,225,000 to be provided from the proceeds of a fund-raising campaign conducted over the last two years. This campaign has produced \$11,673,000 in pledges to date of which \$3,235,000 in net proceeds is now on hand and \$380,000 is expected to be added by November 15, 1974.

Due to the timing of certain campaign pledge receipts, project costs of \$1,561,000 are projected to be paid from the proceeds of unsecured short-term bank loans. The interest expense on these loans is reflected in the projected financial statements.

The estimated initial working capital requirement of \$2,243,000 and the estimated pre-operating cost of \$257,000 will be financed by Tulane University from its own funds, campaign pledges as received, and, to the extent necessary, bank loans. Tulane has obtained lines of credit sufficient to provide, if required, such unsecured short-term bank loans. The financial projections assume that Tulane will provide funds for these purposes from its own funds or additional campaign receipts. Therefore, no interest expense for such purposes is reflected in the projected financial statements.

The projections include an estimate of construction costs based on maximum guaranteed price construction contracts and on negotiated contractors' bids which together cover 93% of the planned facility costs, and on estimates provided by TMC and consulting architects covering the items which have not yet been bid. The balance remaining to be bid, estimated at \$2,585,000, represents primarily movable equipment and miscellaneous items. A provision for change orders of approximately \$360,000 has also been included. As of the date of this report, all construction contracts have been executed or are covered by signed letters of intent. In the opinion of TMC, all bids negotiated to date are binding on the contractors.

Hospital Affiliates, Inc. (HAI), an independent hospital management company, will be responsible for overall management of the hospital and the ambulatory care teaching facility under the terms of an existing contract with TMC. Payment of management fees will be subordinated to debt service under the provisions of the Lease.

Based on our review, we believe the assumptions and rationale are reasonable and appropriate for the purpose of the projections.

Nevertheless, projections are based on assumptions about circumstances and events that have not yet taken place, and are therefore subject to variations that may arise as future operations actually occur. Accordingly, we cannot give assurance that the projected results will actually be attained.

Also, the underlying assumptions are based on present circumstances and information currently available. Because circumstances may change and unanticipated events may occur subsequent to the date of this report, the reader must evaluate the assumptions and rationale in light of circumstances then prevailing.

*Touche Ross & Co.*

**TOUCHE ROSE & CO.**

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**PROJECTED FINANCIAL STATEMENTS**

**D-1-93**

TULANE MEDICAL CENTER HOSPITAL\*

PROJECTED STATEMENT OF REVENUES, EXPENSES AND  
CHANGES IN UNRESTRICTED FUND BALANCES  
(Dollars in Thousands)

	Fiscal Year Ending June 30.				
	1977	1978	1979	1980	1981
<b>UTILIZATION:</b>					
Hospital beds available	310	310	310	310	310
Patient days of care	79,390	83,390	88,363	92,896	98,212
% utilization of available beds	70.3%	73.9%	78.1%	82.2%	86.8%
Ambulatory care teaching facility visits	103,276	121,635	126,222	133,938	144,588
<b>PATIENT SERVICE REVENUE:</b>					
Daily patient services	\$ 8,013	\$ 9,132	\$10,512	\$12,062	\$13,831
Other professional services	9,503	10,854	12,478	14,281	16,401
Outpatient services	1,627	2,066	2,344	2,740	3,161
<b>GROSS PATIENT REVENUE</b>	<u>19,143</u>	<u>22,046</u>	<u>25,334</u>	<u>29,063</u>	<u>33,373</u>
Less allowances and uncollectible accounts	1,022	1,333	1,717	2,107	2,391
<b>NET PATIENT REVENUE</b>	<u>18,121</u>	<u>20,713</u>	<u>23,617</u>	<u>26,956</u>	<u>30,982</u>
<b>OTHER OPERATING REVENUE:</b>					
Ambulatory care teaching facility	1,436	1,438	1,401	1,378	1,358
Parking garage	379	437	507	588	670
Cafeteria, concessions and miscellaneous	890	1,026	1,178	1,331	1,532
<b>TOTAL OTHER OPERATING REVENUE</b>	<u>2,705</u>	<u>2,901</u>	<u>3,086</u>	<u>3,317</u>	<u>3,560</u>
<b>TOTAL OPERATING REVENUE</b>	<u>20,826</u>	<u>23,614</u>	<u>26,703</u>	<u>30,273</u>	<u>34,542</u>
<b>OPERATING EXPENSES:</b>					
Wages, salaries and employee benefits	7,491	8,509	9,721	11,223	12,795
Other operating expenses	9,251	10,624	12,116	13,667	15,213
<b>TOTAL OPERATING EXPENSES</b>	<u>16,742</u>	<u>19,133</u>	<u>21,837</u>	<u>24,890</u>	<u>28,008</u>
<b>OPERATING INCOME BEFORE DEPRECIATION, AMORTIZATION, INTEREST EXPENSE AND SUBORDINATED ADMINISTRATIVE, MANAGE- MENT AND TRUSTEE FEES</b>					
	4,102	4,490	4,866	5,183	5,654
Depreciation and amortization	1,628	1,628	1,628	1,628	1,628
Interest expense	3,188	3,188	3,134	3,103	3,033
Administrative, management and trustee fees	490	649	804	941	1,138
<b>EXCESS (DEFICIENCY) OF REVENUES OVER EXPENSES</b>	<u>(1,204)</u>	<u>(975)</u>	<u>(744)</u>	<u>(489)</u>	<u>(147)</u>
<b>BEGINNING FUND BALANCES</b>	260	2,790	2,576	2,592	2,355
Add Tulane University contributions and transfers from restricted funds	3,734	761	740	252	114
<b>ENDING FUND BALANCES</b>	<u>\$ 2,790</u>	<u>\$ 2,576</u>	<u>\$ 2,576</u>	<u>\$ 2,355</u>	<u>\$ 2,322</u>

\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

TOUCHE ROSS & CO.

TULANE MEDICAL CENTER HOSPITAL\*

PROJECTED STATEMENT OF CHANGES IN FINANCIAL POSITION  
(Dollars in Thousands)

	FISCAL YEAR					
	1975		1976		1977	
	Unre- stricted	Re- stricted	Unre- stricted	Re- stricted	Unre- stricted	Re- stricted
BALANCE AT BEGINNING OF PERIOD	\$-0-	\$-0-	\$-0-	\$21,708	\$-0-	\$6,426
CASH PROVIDED FROM:						
Excess of expenses over revenue					(1,204)	
Add provision for depreciation and amortization					1,628	
TOTAL FROM OPERATIONS	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>424</u>	<u>-0-</u>
Proceeds from sale of bonds		37,500				
Contributions of Tulane University		4,488	257	1,332	1,883	796
Interest earned on invested funds		222		387		415
Increase in notes payable						1,561
Increase in trade accounts payable					1,503	
Increase in current portion of long-term debt						
Increase in accrued interest on long-term debt		2,125				
Transfer from restricted funds			531		372	
TOTAL CASH PROVIDED	<u>-0-</u>	<u>44,335</u>	<u>788</u>	<u>1,719</u>	<u>4,182</u>	<u>2,772</u>
CASH USED FOR:						
Construction progress payments		18,800		15,960		3,040
Increase in deferred charges		1,827	257	2,510		
Reduction of long-term debt						
Increase in accounts receivable					2,974	
Increase in inventories					752	
Decrease in notes payable						
Decrease in accrued interest on long-term debt			531			
Transfer to unrestricted funds				531		372
TOTAL CASH USED	<u>-0-</u>	<u>20,627</u>	<u>788</u>	<u>19,001</u>	<u>3,726</u>	<u>3,412</u>
CASH BALANCE AT END OF PERIOD	<u>\$-0-</u>	<u>\$21,708</u>	<u>\$-0-</u>	<u>\$ 6,426</u>	<u>\$ 456</u>	<u>\$5,786</u>

\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

TOUCHE ROSS & CO.

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ENDING JUNE 30.							
1978		1979		1980		1981	
Unre- stricted	Re- stricted	Unre- stricted	Re- stricted	Unre- stricted	Re- stricted	Unre- stricted	Re- stricted
\$ 456	\$5,786	\$ 522	\$6,193	\$ 854	\$6,380	\$1,189	\$6,557
(975)		(724)		(489)		(147)	
<u>1,628</u>		<u>1,628</u>		<u>1,628</u>		<u>1,628</u>	
<u>633</u>	<u>-0-</u>	<u>906</u>	<u>-0-</u>	<u>1,139</u>	<u>-0-</u>	<u>1,681</u>	<u>-0-</u>
745		500					
	423		427		429		439
233		233		291		355	
400		200		200		200	
<u>16</u>		<u>260</u>		<u>252</u>		<u>114</u>	
<u>2,047</u>	<u>423</u>	<u>2,097</u>	<u>427</u>	<u>1,882</u>	<u>429</u>	<u>2,150</u>	<u>439</u>
400		600		800		1,000	
429		478		550		629	
116		127		166		178	
1,036		525					
		34		51		68	
<u>1,981</u>	<u>16</u>	<u>1,765</u>	<u>240</u>	<u>1,547</u>	<u>252</u>	<u>1,675</u>	<u>114</u>
<u>1,981</u>	<u>16</u>	<u>1,765</u>	<u>240</u>	<u>1,547</u>	<u>252</u>	<u>1,675</u>	<u>114</u>
\$ 522	\$6,193	\$ 854	\$6,380	\$1,189	\$6,557	\$1,464	\$6,892

TOUCHE ROSS & CO.

TULANE MEDICAL CENTER HOSPITAL\*

PROJECTED BALANCE SHEET  
(Dollars in Thousands)

ASSETS	JUNE 30,						
	1975	1976	1977	1978	1979	1980	1981
<b>UNRESTRICTED FUNDS:</b>							
Current assets:							
Cash	\$	\$	\$ 436	\$ 322	\$ 854	\$ 1,189	\$ 1,484
Accounts receivable (net of provision for allowances and uncollectibles)			2,974	3,403	3,882	4,432	5,061
Inventories			752	868	892	1,141	1,212
<b>TOTAL CURRENT ASSETS</b>	<u>—</u>	<u>—</u>	<u>4,162</u>	<u>4,593</u>	<u>5,628</u>	<u>6,762</u>	<u>7,757</u>
Other:							
Property, plant and equipment	18,800	34,760	37,800	37,800	37,800	37,800	37,800
Less accumulated depreciation			(1,453)	(2,908)	(4,359)	(5,812)	(7,263)
	<u>18,800</u>	<u>34,760</u>	<u>36,347</u>	<u>34,892</u>	<u>33,441</u>	<u>31,988</u>	<u>30,537</u>
Deferred charges	1,827	4,594	4,594	4,594	4,594	4,594	4,594
Less accumulated amortization			(178)	(350)	(525)	(700)	(875)
	<u>1,827</u>	<u>4,594</u>	<u>4,416</u>	<u>4,244</u>	<u>4,069</u>	<u>3,894</u>	<u>3,719</u>
<b>TOTAL OTHER ASSETS</b>	<u>20,627</u>	<u>39,354</u>	<u>40,766</u>	<u>39,138</u>	<u>37,510</u>	<u>35,882</u>	<u>34,256</u>
<b>TOTAL UNRESTRICTED FUNDS</b>	<u>\$20,627</u>	<u>\$39,354</u>	<u>\$44,968</u>	<u>\$43,931</u>	<u>\$43,261</u>	<u>\$42,666</u>	<u>\$42,098</u>
<b>RESTRICTED FUNDS:</b>							
Cash and securities:							
Escrow account	\$ 4,710	\$ 683	\$ 43	\$ 50	\$ 54	\$ 56	\$ 63
Rental payment fund			43	50	54	56	63
Project acquisition fund	9,536						
Debt service fund	3,313	1,394	1,594	1,994	2,177	2,352	2,518
Debt service reserve fund	4,149	4,149	4,149	4,149	4,149	4,149	4,149
Cash - renewal and replacement fund							150
<b>TOTAL RESTRICTED FUNDS</b>	<u>\$21,708</u>	<u>\$ 6,426</u>	<u>\$ 5,286</u>	<u>\$ 6,193</u>	<u>\$ 6,390</u>	<u>\$ 6,557</u>	<u>\$ 6,882</u>

\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

LIABILITIES AND FUND BALANCES	JUNE 30,						
	1975	1976	1977	1978	1979	1980	1981
<b>UNRESTRICTED FUNDS:</b>							
Current liabilities:							
Accounts payable	\$	\$	\$ 1,503	\$ 1,736	\$ 1,989	\$ 2,280	\$ 2,635
Notes payable to banks			1,561	525			
Current installments of long-term debt				400	600	800	1,000
Accrued interest on long-term debt				1,994	1,560	1,509	1,661
<b>TOTAL CURRENT     LIABILITIES</b>	<b>2,123</b>	<b>1,594</b>	<b>1,594</b>	<b>4,255</b>	<b>4,149</b>	<b>4,589</b>	<b>5,076</b>
Long-term debt	37,500	37,500	37,500	37,100	36,500	35,700	34,700
Fund balance	(18,998)	260	2,790	2,576	2,392	2,355	2,322
<b>TOTAL UNRESTRICTED FUNDS</b>	<b>\$20,627</b>	<b>\$39,354</b>	<b>\$44,948</b>	<b>\$43,931</b>	<b>\$43,241</b>	<b>\$42,644</b>	<b>\$42,098</b>
<b>RESTRICTED FUNDS:</b>							
Escrow account - fund balance	\$ 4,710	\$ 583	\$	\$	\$	\$	\$
Rental payment fund - fund balance			43	50	54	56	63
Project acquisition fund - fund balance	9,536						
Debt service fund - fund balance	3,313	1,594	1,594	1,994	2,177	2,392	2,518
Debt service reserve fund - fund balance	4,149	4,149	4,149	4,149	4,149	4,149	4,149
Renewal and replacement fund - fund balance							130
<b>TOTAL RESTRICTED FUNDS</b>	<b>\$21,708</b>	<b>\$6,426</b>	<b>\$5,736</b>	<b>\$6,193</b>	<b>\$6,390</b>	<b>\$6,537</b>	<b>\$6,863</b>

**TULANE MEDICAL CENTER HOSPITAL\***

**PROJECTED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1975  
(Dollars in Thousands)**

VOUCHE ROSS & CO.

	<u>Escrow</u> <u>Account</u>	<u>Rental</u> <u>Payment</u> <u>Fund</u>	<u>Revenue</u> <u>Fund</u>	<u>Project</u> <u>Acquisition</u> <u>Fund</u>	<u>Debt</u> <u>Service</u> <u>Fund</u>	<u>Debt</u> <u>Service</u> <u>Reserve</u> <u>Fund</u>	<u>Renewal</u> <u>and</u> <u>Replacement</u> <u>Fund</u>
BEGINNING CASH BALANCES	\$-0-	\$-0-	\$-0-	\$-0-	\$-0-	\$-0-	\$-0-
SOURCES OF CASH:							
Proceeds of bond issue (net of bond discount)				27,663	5,313	4,149	
Accrued interest on bonds				131			
Transfer from debt service reserve fund				220			
Transfer from debt service fund				282			
Payment from Tulane University	3,615						
Interest earned on invested funds	222			693	282	220	
Collection of pledged contributions	873						
	<u>4,710</u>	<u>-0-</u>	<u>-0-</u>	<u>28,989</u>	<u>5,895</u>	<u>4,369</u>	<u>-0-</u>
USES OF CASH:							
Payment to NEAL				140			
Transfer to project acquisition fund					262	220	
Payment of bond issuance expenses				313			
Project acquisition progress payments				19,000			
	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>19,453</u>	<u>262</u>	<u>220</u>	<u>-0-</u>
ENDING CASH BALANCES	<u>\$4,710</u>	<u>\$-0-</u>	<u>\$-0-</u>	<u>\$ 9,516</u>	<u>\$5,213</u>	<u>\$4,149</u>	<u>\$-0-</u>

\* Includes the Ambulatory Care Teaching Facility and Parking garage.

The accompanying assumptions and rationale are an integral part of this projection.

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TULANE MEDICAL CENTER HOSPITAL\*

PROJECTED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1976  
(Dollars in Thousands)

TRUENIT ROSS & CO.

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	<u>Escrow</u>	<u>Rental</u>	<u>Revenue</u>	<u>Project</u>	<u>Debt</u>	<u>Debt</u>	<u>Renewal</u>
	<u>Account</u>	<u>Payment</u>	<u>Fund</u>	<u>Acquisition</u>	<u>Service</u>	<u>Service</u>	<u>and</u>
		<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Reserve</u>	<u>Replacement</u>
						<u>Fund</u>	<u>Fund</u>
BEGINNING CASH BALANCES	<u>\$4,710</u>	<u>\$-0-</u>	<u>\$-0-</u>	<u>\$ 9,526</u>	<u>\$3,212</u>	<u>\$4,148</u>	<u>\$-0-</u>
SOURCES OF CASH:							
Transfer from debt service reserve fund				353			
Transfer from debt service fund				201			
Interest earned on invested funds	387			230	203	353	
Collection of pledged contributions	<u>1,332</u>						
	<u>1,719</u>	<u>-0-</u>	<u>-0-</u>	<u>794</u>	<u>203</u>	<u>353</u>	<u>-0-</u>
USES OF CASH:							
Transfer to project acquisition fund					203	153	
Project acquisition progress payments	5,746			10,214			
Payment of trustee service charges				38			
Payment to bond holders					3,719		
Payment to HEAL				79			
	<u>5,746</u>	<u>-0-</u>	<u>-0-</u>	<u>10,331</u>	<u>3,922</u>	<u>353</u>	<u>-0-</u>
ENDING CASH BALANCES	<u>\$ 4,694</u>	<u>\$-0-</u>	<u>\$-0-</u>	<u>\$ -0-</u>	<u>\$1,594</u>	<u>\$4,148</u>	<u>\$-0-</u>

\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

TULANE MEDICAL CENTER HOSPITAL\*

PROJECTED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1977  
(Dollars in Thousands)

TOUCHE ROSS & CO.

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	<u>Lecrow</u> <u>Account</u>	<u>Rental</u> <u>Payment</u> <u>Fund</u>	<u>Revenue</u> <u>Fund</u>	<u>Project</u> <u>Acquisition</u> <u>Fund</u>	<u>Debt</u> <u>Service</u> <u>Fund</u>	<u>Debt</u> <u>Service</u> <u>Reserve</u> <u>Fund</u>	<u>Renewal</u> <u>and</u> <u>Replacement</u> <u>Fund</u>
BEGINNING CASH BALANCES	<u>\$ 683</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$1,594</u>	<u>\$4,149</u>	<u>\$ -0-</u>
SOURCES OF CASH:							
Transfer from debt service reserve fund					353		
Transfer from rental payment fund			2,914				
Payment from Tulane University		2,914					
Interest earned on invested funds		62				353	
Transfer from revenue fund					2,835		
Collection of pledged contributions	258						
Proceeds from conversion of securities to cash	<u>538</u>						
	<u>796</u>	<u>2,976</u>	<u>2,914</u>	<u>-0-</u>	<u>3,188</u>	<u>353</u>	<u>-0-</u>
USES OF CASH:							
Transfer to revenue fund		2,914					
Transfer to debt service fund			2,835			353	
Payment to HEAT			79				
Payment of trustee service charges		19					
Payment to bond holders					3,188		
Construction progress payments	<u>1,479</u>						
	<u>1,479</u>	<u>2,933</u>	<u>2,914</u>	<u>-0-</u>	<u>3,188</u>	<u>353</u>	<u>-0-</u>
ENDING CASH BALANCES	<u>\$ -0-</u>	<u>\$ 62</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$1,594</u>	<u>\$4,149</u>	<u>\$ -0-</u>

\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

**TULANE MEDICAL CENTER HOSPITAL\***

**PROJECTED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1978  
(Dollars in Thousands)**

TOUCHE ROSE & CO.

	Rental Payment Fund	Revenue Fund	Project Acquisition Fund	Debt Service Fund	Debt Service Reserve Fund	Renewal and Replacement Fund
BEGINNING CASH BALANCES	\$ 41	\$ -0-	\$ -0-	\$1,994	\$4,149	\$ -0-
SOURCES OF CASH:						
Payment from Tulane University	3,271					
Transfer from rental payment fund		3,314				
Transfer from revenue fund				3,235		
Interest earned on invested funds	70				353	
Transfer from debt service reserve fund				353		
	<u>3,341</u>	<u>3,314</u>	<u>-0-</u>	<u>3,588</u>	<u>353</u>	<u>-0-</u>
USES OF CASH:						
Transfer to revenue fund	3,314					
Transfer to debt service fund		3,235			353	
Payment to HEAL		79				
Payment of trustee service charges	20					
Payment to bond holders				1,188		
	<u>3,334</u>	<u>3,314</u>	<u>-0-</u>	<u>1,188</u>	<u>353</u>	<u>-0-</u>
ENDING CASH BALANCES	\$ 50	\$ -0-	\$ -0-	\$1,994	\$4,149	\$ -0-

\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

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**TULANE MEDICAL CENTER HOSPITAL\***

**PROJECTED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1979  
(Dollars in Thousands)**

TOUCHE ROSS & CO.

	<u>Rental Payment Fund</u>	<u>Revenue Fund</u>	<u>Project Acquisition Fund</u>	<u>Debt Service Fund</u>	<u>Debt Service Reserve Fund</u>	<u>Renewal and Replacement Fund</u>
<b>BEGINNING CASH BALANCES</b>	<u>\$ 50</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$1,994</u>	<u>\$4,149</u>	<u>\$ -0-</u>
<b>SOURCES OF CASH:</b>						
Payment from Tulane University	3,430					
Transfer from rental payment fund		3,480				
Transfer from revenue fund				3,401		
Interest earned on invested funds	74				353	
Transfer from debt service reserve fund				<u>353</u>		
	<u>3,504</u>	<u>3,480</u>	<u>-0-</u>	<u>3,754</u>	<u>353</u>	<u>-0-</u>
<b>USES OF CASH:</b>						
Transfer to revenue fund	3,480					
Transfer to debt service fund		3,401			353	
Payment to NEAL		79				
Payment of trustee service charges	20					
Payment to bond holders				<u>3,571</u>		
	<u>3,500</u>	<u>3,480</u>	<u>-0-</u>	<u>3,571</u>	<u>353</u>	<u>-0-</u>
<b>ENDING CASH BALANCES</b>	<u>\$ 54</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$2,172</u>	<u>\$4,149</u>	<u>\$ -0-</u>

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\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

TULANE MEDICAL CENTER HOSPITAL\*

PROJECTED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1980  
(Dollars in Thousands)

TOUCHE ROSS & CO.

	<u>Rental</u>	<u>Revenue</u>	<u>Project</u>	<u>Debt</u>	<u>Debt</u>	<u>Renewal</u>
	<u>Payment</u>	<u>Fund</u>	<u>Acquisition</u>	<u>Service</u>	<u>Service</u>	<u>and</u>
	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Reserve</u>	<u>Replacement</u>
	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>
BEGINNING CASH BALANCES	\$ 56	\$ -0-	\$ -0-	\$2,177	\$4,149	\$ -0-
SOURCES OF CASH:						
Payment from Tulane University	3,575					
Transfer from rental payment fund		3,629				
Transfer from revenue fund				3,550		
Interest earned on invested funds	76				353	
Transfer from debt service reserve fund				353		
	<u>3,651</u>	<u>3,629</u>	<u>-0-</u>	<u>3,903</u>	<u>353</u>	<u>-0-</u>
USES OF CASH:						
Transfer to revenue fund	3,629					
Transfer to debt service fund		3,550			353	
Payment to HEAL		79				
Payment of trustee service charges	20					
Payment to bond holders				3,728		
	<u>3,649</u>	<u>3,629</u>	<u>-0-</u>	<u>3,728</u>	<u>353</u>	<u>-0-</u>
ENDING CASH BALANCES	\$ 56	\$ -0-	\$ -0-	\$2,177	\$4,149	\$ -0-

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\* Includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

TULANE MEDICAL CENTER HOSPITAL\*

FINLISHED STATEMENT OF CHANGES IN RESTRICTED FUND BALANCES  
FOR THE FISCAL YEAR ENDING JUNE 30, 1981  
(Dollars in Thousands)

TOUCHE ROSS & CO.

	<u>Rental</u>	<u>Revenue</u>	<u>Project</u>	<u>Debt</u>	<u>Debt</u>	<u>Renewal</u>
	<u>Payment</u>	<u>Fund</u>	<u>Acquisition</u>	<u>Service</u>	<u>Service</u>	<u>and</u>
	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Reserve</u>	<u>Replacement</u>
	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>	<u>Fund</u>
BEGINNING CASH BALANCES	<u>\$ 56</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$2,152</u>	<u>\$4,149</u>	<u>\$ -0-</u>
SOURCES OF CASH:						
Payment from Tulane University	4,055					
Transfer from rental payment fund		4,111				
Transfer from revenue fund				3,882		150
Interest earned on invested funds	86				253	
Transfer from debt service reserve fund				<u>353</u>		
	<u>4,141</u>	<u>4,111</u>	<u>-0-</u>	<u>4,235</u>	<u>253</u>	<u>150</u>
USES OF CASH:						
Transfer to revenue fund	4,111					
Transfer to debt service fund				3,882		150
Payment to HEAL		79				
Payment of trustee service charges	21					
Payment to bond holders				3,869		
Transfer to renewal and replacement fund		<u>150</u>				
	<u>4,132</u>	<u>4,111</u>	<u>-0-</u>	<u>3,869</u>	<u>253</u>	<u>-0-</u>
ENDING CASH BALANCES	<u>\$ 65</u>	<u>\$ -0-</u>	<u>\$ -0-</u>	<u>\$2,319</u>	<u>\$4,149</u>	<u>\$150</u>

\* includes the Ambulatory Care Teaching Facility and Parking Garage.

The accompanying assumptions and rationale are an integral part of this projection.

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ASSUMPTIONS AND RATIONALE

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## ASSUMPTIONS AND RATIONALE

### Proposed Expansion Program

#### Background, Organization and Management

The Tulane Medical Center (TMC), owned by and an integral part of Tulane University, New Orleans, Louisiana, is one of three medical education institutions in the State. The TMC clinical faculty physicians presently utilize available facilities at Charity Hospital (a State-sponsored hospital offering care primarily to indigent patients), the Tulane Clinical Care Center and other local hospitals, to conduct their medical education programs. Partially as a result of long range planning by Tulane which began in the late 1960's and partially due to studies by the Health Education Authority of Louisiana (HEAL), TMC has embarked on a program to construct new medical center teaching facilities. Construction of the new teaching hospital, ambulatory care teaching facility and parking garage is presently underway near the existing site of the Tulane Medical Center in downtown New Orleans.

The new facilities are to be operated and maintained by TMC administration. TMC has entered into a contractual agreement with Hospital Affiliates, Inc. (HAI), a national hospital management company, under which HAI, for a management fee, has authority and responsibility for general management and administration of the hospital and ambulatory care teaching facility. This contract has been assigned by HAI to Hospital Management Corporation (HMC), a wholly owned subsidiary of HAI, with performance guaranteed by HAI.

#### Facilities and Services

The expansion program is planned to provide facilities for a 310-bed acute care teaching hospital, an ambulatory care teaching facility with approximately 100 examination/treatment rooms for outpatients, and an 875-space parking garage. The hospital will have medical, surgical, psychiatric, pediatric, obstetrics, nursery, intensive care, and coronary care nursing units. It will also contain facilities for laboratory, radiology, nuclear medicine, physical therapy, respiratory therapy, emergency, operating room, EEG, EKG and other ancillary services. The ancillary and general service departments

of the hospital are expected to support the inpatient and outpatient services of the hospital and the ambulatory care teaching facility.

Construction of the facilities began in the Fall of 1973 and is scheduled for completion in early 1976. Operations are expected to commence by July 1, 1976.

#### Project Costs and Sources of Financing

The anticipated costs of the facilities, equipment, and bond issue, and the sources of financing for the project are shown in Table I.

The land acquisition cost is the actual price as stated in the land sales agreement. The cost of buildings and fixed equipment is based on maximum guaranteed price construction contracts and formally negotiated bids which, together, represent a substantial percentage of the total estimated cost. The cost of movable equipment is based on negotiated purchase orders and on the most recent estimates approved by HAI. Engineering, architectural, legal and bond issuance costs are based on existing contracts. Funded construction period interest and debt service reserve requirements are as estimated by Goldman Sachs & Co., financial advisors to Tulane. Approximately 50 percent of the contributions shown in Table I represent amounts already collected from the fund-raising campaign conducted in the past two years. This amount will be restricted for use only in the project under the terms of the Lease and Agreement with HEAL, and held in an escrow account until the project is completed.

#### Bond Funds

Based on estimates of Goldman Sachs & Co, the \$37,500,000 tax exempt revenue bonds will bear interest at 8.50% per annum. The bonds are to be dated November 1, 1974 with receipt of proceeds expected about November 15, 1974. A bond discount equal to 1% of the principal amount of the bond issue is anticipated. Interest on the bonds for 20 months and debt service reserves sufficient to cover the maximum annual debt service requirements are included in the bond issue. The period of the bond issue is 35 years.

TABLE 1

PROJECTED SOURCES AND USES OF PROJECT FUNDS

USES OF FUNDS	Hospital	Ambulatory Care Teaching Facility	Parking Garage	Total	
Land (including demolition)	\$ 1,154,000	\$ 1,126,000	\$2,187,000	\$ 4,467,000	
Buildings	6,912,500	4,100,000	3,265,000	14,277,500	
Architects and other pro- fessional fees	1,341,000	760,000	451,500	2,552,500	
Fixed equipment	6,966,000	4,216,000	651,000	11,833,000	
Major movable equipment	3,185,000	1,125,000	-	4,310,000	
Contingency	184,000	102,000	74,000	360,000	
Interim financing	<u>95,500</u>	<u>53,000</u>	<u>51,500</u>	<u>200,000</u>	
Estimated Project Costs	\$19,838,000	\$11,482,000	\$6,680,000	\$38,000,000	
Debt Service Reserve Fund				\$ 4,149,000	
Construction period interest*				3,192,000	
Bond discount				375,000	
Authority and Trustee admin- istration fees during construction				257,000	
Legal, consulting, financial, printing and miscellaneous				<u>313,000</u>	
Estimated Financing Costs				<u>8,286,000</u>	
<b>TOTAL USES</b>				<b>\$46,286,000</b>	
<b>SOURCES OF FUNDS</b>				<b>\$37,500,000</b>	
Principal amount of bond issue				7,225,000	
Contribution from Tulane, estimated				<u>1,561,000</u>	
Unsecured short-term bank loans				<u>1,561,000</u>	
<b>TOTAL SOURCES</b>				<b>\$46,286,000</b>	

\*Represents gross interest on bonds during construction of \$5,313,000 less estimated interest earnings of \$1,990,000 on bond funds invested during the construction period and accrued interest on bonds of \$131,000.

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Bond Resolution and Lease

A Rental Payment Fund will be established, in accordance with the Lease between HEAL and Tulane and an escrow agreement between Tulane and a trustee bank. Tulane University will be required to make monthly payments into this Rental Payment Fund from gross receipts of the project and from its general funds, if necessary, in amounts required to fulfill the obligations under the Lease described below.

The Bond Resolution establishes the following funds and separate accounts to be held and maintained by the Trustee:

- Revenue Fund
- Project Acquisition Fund
- Debt Service Fund
  - . Interest Account
  - . Principal Account
  - . Sinking Fund Account
- Debt Service Reserve Fund
- Renewal and Replacement Fund
- Redemption Fund

In addition, the Lease and Agreement between HEAL and the Administrators of the Tulane Educational Fund requires the creation of a special trust fund called the Escrow Account (to be established pursuant to an escrow agreement between Tulane and a trustee bank) whereby Tulane University will deposit initially all campaign contributions on hand, with monthly deposits of additional pledged contributions as received to bring the account up to the amount required to fund the project. Interest earned on these trust funds will be retained in the Escrow Account until the project is completed.

Under the terms of the Bond Resolution, tax exempt revenue bonds are to be issued by HEAL in order to acquire the proposed facilities from Tulane. HEAL will then lease the facilities back to TMC. Lease payments are to be in amounts sufficient to pay interest and principal on the bonds, plus Authority and Trustee fees and Renewal and Replacement Fund requirements.

Government Approvals and Tax Status

Construction plans for the proposed facility have been approved by the Planning and Zoning Division of the City of New Orleans. A Certificate of Need has been granted by the State of Louisiana and the Area Health Planning Council, in accordance with PL 92-603 (HR-1). Consequently, the facility is expected to receive full reimbursement of facility costs under the Medicare and Medicaid programs.

It was assumed for the purposes of this study that TMC is a bona-fide non-profit organization under the definitions of Section 501 (c) 3 of the Internal Revenue Code. Bond counsel is to provide an opinion that the interest income on the bonds is not subject to federal income tax.

Projected Levels of Patient Care

Service Areas

Based on current patient migration patterns in the New Orleans metropolitan area and patient referral patterns at comparable university teaching hospitals, three service areas for the new facility have been defined.

The primary service area is defined as the central portion of Orleans Parish (City of New Orleans). This area, with a population of some 450,000, is expected to generate about half of the hospital admissions.

The secondary service area is defined as the remainder of the greater New Orleans metropolitan area. This area, comprising five parishes with an approximate population of 600,000, is expected to generate about one-third of the hospital admissions.

Since the proposed facility is a teaching hospital, it is expected to draw referral patients for complex diagnoses and procedures from a regional area, a third service area, which includes the State of Louisiana and the Western part of Mississippi. This service area is initially expected

to account for 16% of the hospital's patients (reflecting current experience of major New Orleans hospitals), increasing to approximately 37% of the patient load by the fifth year of operation. This projected increase is based on: (a) the referral experience of comparable teaching hospitals and (b) the expectation that TMC's hospital will gain the reputation for medical care excellence which has been attained by other teaching hospitals.

#### Population Trends

A composite of the latest available population projections prepared by Louisiana State University and local planning agencies is summarized in Table II. The data indicate a steady growth trend in the metropolitan area as a whole, but, as is typical of many urban areas, there is a gradual decline in the "inner city" population while strong growth is projected for the suburban areas.

TABLE II  
POPULATION GROWTH PROJECTIONS 1970-1980

	Actual 1970	Projected 1980	Percent Change 1970-80	Projected 1990	Percent Change 1970-90
Primary Service Area	471,478	439,100	-6.9%	424,200	-10.0%
Secondary Service Area	<u>374,992</u>	<u>784,900</u>	<u>+36.5%</u>	<u>998,700</u>	<u>+73.7%</u>
New Orleans SMSA*	<u>1,046,470</u>	<u>1,224,000</u>	<u>+17.0%</u>	<u>1,422,900</u>	<u>+36.0%</u>

\*Standard Metropolitan Statistical Area as defined by the U.S. Census Bureau.

Analysis of Area Need for Beds

An analysis of existing and planned hospital beds in New Orleans indicated a moderate surplus of beds. Through 1980, the overall utilization of area beds is projected to decline from 74% to 67% if all planned facilities are actually constructed. These projections, shown in Table III, assume continuation of the current hospital use rate of 4.0 beds per 1,000 population.

TABLE III

PROJECTED AREA BED UTILIZATION

	<u>1975</u>	<u>1977</u>	<u>1979</u>	<u>1980</u>
Population	1,101,720	1,142,480	1,183,240	1,224,000
Hospital Bed Use Rate (per 1,000 population)	<u>4.0</u>	<u>4.0</u>	<u>4.0</u>	<u>4.0</u>
Beds Occupied	4,407	4,570	4,733	4,896
Beds Available	5,938	6,515	6,785	7,280
Percent Bed Utiliza- tion (Overall)	74%	70%	70%	67%

Based on these analyses, it was estimated that the proposed TMC Hospital could achieve an initial 70% utilization from the primary and secondary service areas, the same as the projected New Orleans overall average for all hospitals, including 16% from outside the New Orleans SMSA. Referrals from outside the New Orleans SMSA were estimated to increase the hospital's utilization over the projection period to an 85% utilization level by fiscal year 1981.

Faculty Clinical Practice

The present level of clinical practice workload of the faculty physicians was analyzed through questionnaires and interviews with TMC Administration and Department Chairmen. Also, the faculty physicians were surveyed directly as to their present patient care workloads. The results of this analysis are summarized in Table IV.

TABLE IV

ANALYSIS OF FULL-TIME CLINICAL FACULTY PHYSICIANSPresent Level of Clinical Practice

<u>Department</u>	<u>Number of Full-Time Physicians</u>	<u>Annual Private Office Visits</u>	<u>Average Daily Private Inpatient Census (Est.)</u>
Medicine	27	6,372	3
Obstetrics and Gynecology	7	5,256	8
Ophthalmology	2	1,392	3
Otolaryngology	2	2,640	2
Pediatrics	8	0	0
Surgery	19	11,360	99
Psychiatry and Neurology	<u>19</u>	<u>7,908</u>	<u>11</u>
	<u>84</u>	<u>34,908</u>	<u>128</u>

Age Distribution

<u>Age Group</u>	<u>Number of Full-Time Physicians</u>	<u>Percent of Total Faculty</u>
Under 35	13	15.5%
35-45	33	39.3
46-55	23	27.6
Over 55	<u>15</u>	<u>17.8</u>
	<u>84</u>	<u>100.0%</u>

Source: Physician questionnaires submitted in October, 1973.

An overall program for development and augmentation of the faculty clinical practice has been initiated by TMC. The objective of this program is to change the orientation of the medical school faculty toward greater emphasis on patient care. Specifically, this program includes the following major action steps:

1. Initiate a Strict Full-Time Faculty Practice Plan (group clinical practice) effective July 1, 1974. Implementation of this plan is proceeding on schedule. As of July 1, 1974, 84 faculty members were participating in the plan.
2. Employ 14 additional clinical faculty physicians by the time the hospital opens, and add 11 more physicians by 1980. Additional physicians are expected to be primarily clinically oriented. Recruiting is currently underway for selecting new Chairmen for the Departments of Medicine, Clinical Pathology and Anesthesiology, as well as for finding other suitable candidates for the 11 new positions authorized for fiscal year 1974-1975. Candidates are currently being considered for a number of these positions.
3. Implement new policies and procedures which will increase by 40% the level of patient care being rendered in Tulane's facilities by its current physician staff.
4. Establish contractual programs, if feasible, for the provision of health care services to defined patient populations. Discussions have been initiated with several prospective sponsor groups.

Based on the application of normal per-capita physician requirements (as published by the American Medical Association) to the New Orleans population projections, there is a projected need for 126 additional physicians in New Orleans by 1975 and 291 physicians by 1981.

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Given this projected need, along with TMC's program for implementation of their Faculty Practice Plan, TMC expects to develop sufficient physician workloads to attain the projected levels of patient care shown in Table V.

TABLE V  
PROJECTED LEVELS OF PATIENT CARE

	<u>Fiscal Years Ending June 30</u>					
	<u>Present *</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Number of Physicians	84	100	115	116	117	120
% of Time Spent on Clinical Practice	19%	42%	46%	47%	50%	53%
Total Ambulatory Care Visits	36,720	103,276	121,633	126,222	135,938	144,588
Hospital Admissions	4,384	9,132	9,581	10,139	10,670	11,269
Average Length of Stay (days)	10.7	8.7	8.7	8.7	8.7	8.7
Total Patient Days	46,912	79,590	83,590	88,363	92,996	98,212
Average Daily Census	128	218	229	242	254	269
Beds Available	N/A	310	310	310	310	310
% Utilization of Available Beds	N/A	70.3	73.9	78.1	82.2	86.8
Newborn Days	N/A	4,498	4,725	4,994	5,254	5,557
Inpatient Ancillary Procedures (000)	N/A	734	760	815	858	905
Outpatient Ancillary Procedures (000)	N/A	185	197	205	220	233
Emergency Room Visits (000)	N/A	14	15	16	17	17

\*Source: Physician questionnaires submitted in October, 1973.

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Patient Service RevenuesDaily Patient Services

Routine daily hospital charges were estimated based on average charges at comparable teaching hospitals and major general acute care hospitals in New Orleans. These charges were projected to increase at an overall rate of 8.75% each year. The charges so determined were applied to projected patient days in order to estimate daily patient service revenues.

Other Professional Services

Charges for operating room, laboratory, radiology, pharmacy, central supply and other ancillary services were estimated based on experience at comparable teaching hospitals. These charges were projected to increase by 8.75% each year. The rates so determined were multiplied by projected occasions of inpatient ancillary services in each department in order to estimate revenues from other professional services.

Outpatient Services

Charges for emergency room services and outpatient ancillary services were estimated based on experience at comparable teaching hospitals. These rates were projected to increase by 8.75% each year. The rates so determined were multiplied by projected outpatient occasions of service in each department in order to estimate outpatient service revenues.

Provision for Allowances  
and Uncollectible Accounts

Provision for contractual allowances associated with Medicare and Medicaid patient revenues were computed to be the difference between full charges and costs allowed under current Medicare and Medicaid cost reimbursement regulations.

Provision for uncollectible charges to Blue Cross, commercial insurers and self-pay accounts were estimated at 5.0% of gross charges to these patients, based upon the experience at comparable teaching hospitals and discussions with HAI. In addition, 1% of hospital admissions were estimated to be free service patients.

Other Operating RevenuesAmbulatory Care Teaching Facility

Revenue from the ambulatory care teaching facility represents that portion of the TMC Faculty Practice Plan income to be paid to the hospital, to cover estimated applicable interest, depreciation and amortization expense). Under the terms of the faculty practice plan, such payments are to be made from the gross collections generated by the faculty prior to using such funds to meet physician salary costs and prior to making any distribution of net income to the members of the plan.

Parking Garage

Public parking revenues were based on estimates provided by a consortium of three area parking garage management companies, and confirmed by estimates of the project consulting architectural engineers.

Contractual parking revenues generated through monthly rental of spaces to Tulane faculty and staff were estimated based on information provided by TMC administration.

Revenue from rental of commercial space in the garage was estimated based on information from the parking consortium and TMC.

Cafeteria, Concessions and Miscellaneous Revenues

Income from the cafeteria, snack bar, gift shop, concessions and miscellaneous sources was estimated at 4.65% of patient care revenues based on experience at comparable teaching hospitals.

Operating ExpensesWages, Salaries and Employee Benefits

Planned staffing tables by department by year were developed as a basis for the financial projections. Based on discussions with HAI and TMC administration, an overall staffing ratio of 3.3 employees per occupied bed was used as a guideline. Average salary and wage rates for area hospitals were applied to department staffing requirements in order to estimate base salary and wage expenses. A 10% increment was applied to selected departments to allow for overtime and shift differential pay based on experience at other hospitals. Employee welfare benefit costs were estimated at 12% of salary costs based on current TMC experience and HAI's experience at other hospitals.

An annual salary and wage expense inflation factor of 8.0% was applied throughout the projection period based on recent experience of TMC and discussions with HAI.

Other Operating Expenses

Variable supply costs per unit of service were established based on existing relationships at comparable teaching hospitals. These unit cost factors were applied to projected departmental workloads to estimate total variable supply costs.

Contractual laundry service costs were estimated based on actual cost experience at a major New Orleans hospital for similar services.

Utilities costs were estimated based on current experience of Tulane University and discussions with HAI.

Insurance costs were estimated by Tulane University's insurance advisor.

Security service costs were estimated based on information from TMC administration.

Supply and service expenses were projected to increase at a rate of 9.0% per year based on recent experience at comparable hospitals and discussions with HAI.

Interest expense on short-term bank loans required to finance project costs was estimated at 12% of the average outstanding loan balance in each year.

Since all fixed and movable equipment is to be purchased, no leased equipment or facilities costs were projected.

#### Non-Operating Revenue

##### Interest Earned on Invested Funds

Interest earnings on restricted funds were estimated at 8.5% of average fund balances available for investment.

##### Depreciation and Amortization Expense

##### Depreciation Expense

Depreciation expense was estimated using the straight-line method and applying Medicare guidelines for estimated asset lives to projected building and equipment costs as follows:

<u>Asset</u>	<u>Projected Cost</u>	<u>Estimated Life</u>	<u>Annual Provision for Depreciation</u>
Buildings	\$ 17,190,000	40 years	\$430,000
Fixed Equipment	11,833,000	20 years	592,000
Movable Equipment	4,310,000	10 years	431,000

##### Amortization Expense

Amortization expense was estimated using the straight-line method and applying Medicare guidelines for estimated lives to the cost of financing the bond issue, to pre-operating expenses and to capitalized construction interest, as follows:

<u>Asset</u>	<u>Amortization Period</u>	<u>Annual Amortization</u>
Bond Issuance Expense	33 years	\$27,000
Pre-Operating Expense	5 years	51,000
Capitalized Interest	35 years	97,000

Bond Administrative, Management and Trustee FeesBond Administrative Fees

These fees were based on an existing contract between TMC and HEAL. Also included is an estimate of bond trustee service charges based on information supplied by local banks to TMC.

Hospital Management Fee

The estimated amount of annual fees paid to HAI for management of the hospital was based on provisions of an existing contract between TMC and HAI.

Interest Expense

Interest expense on the outstanding bonds was estimated at 8.5% in accordance with an estimated debt service schedule prepared by Goldman Sachs & Co.

Working Capital Requirements

Required working capital was based on 60 days average accounts receivable outstanding, 60 days accounts payable outstanding, 40 days inventory and 10 days of annual operating expenses available in cash balances. These estimates were based on discussions with TMC and HAI.

Debt Service Coverage

The relationship between funds generated from operations and from earnings on bond funds, and accrued annual debt service requirements is projected below. Debt service requirements are based upon an estimated debt service schedule provided by Goldman Sachs & Co.

	(Dollars in thousands)				
	Fiscal Year Ending June 30.				
	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Operating income before depreciation, amortization, interest expense and subordinated administrative, management and Trustee Fees	\$4,102	\$4,490	\$4,866	\$5,183	\$5,654
Add interest earned on restricted funds	<u>415</u>	<u>423</u>	<u>427</u>	<u>429</u>	<u>439</u>
Funds available for debt service	\$4,517	\$4,913	\$5,293	\$5,612	\$6,093
Debt service requirement	\$3,188	\$3,588	\$3,754	\$3,903	\$4,035
Ratio of funds available for debt service to debt service requirement	1.42	1.37	1.41	1.44	1.51

If Tulane were to borrow all of the funds required to finance working capital and pre-operating expense, the debt service coverage shown would be 1.39 in 1977, 1.35 in 1978, 1.39 in 1979, 1.42 in 1980 and 1.50 in 1981.

**APPENDIX E**

**KEY PERSONNEL QUALIFICATIONS - PHASE II**

**BIOGRAPHICAL REFERENCE**

**Streuby L. Drums**

**Occupation:** Vice President  
Gulf States Assets Management, Inc.

Former President  
West Penn Power Company/Pittsburgh (Greensburg), Pa.

Former Vice President  
W. O. Public Service, Inc.

**Education:** Graduate U. S. Naval Academy - B. S. Degree

**Current Service:** Director:

Bureau of Governmental Research  
Metropolitan Area Committee  
Tulane University Business Council  
New Orleans Area Health Planning Council  
Pittsburgh National Bank (Advisory Director)

**Trustee:**

Health Education Authority of Louisiana  
St. Charles Avenue Presbyterian Church  
Stanton Pratt Manor

**Past Service:** Director:

Pittsburgh National Bank  
Louisiana Board of Commerce & Industry  
International House  
Chamber of Commerce of New Orleans  
Pennsylvania Planning Board  
Regional Ind. Devel. Corp. of S. W. Pa.  
Allegheny Conference  
Federal Reserve Bank of Cleveland/Pittsburgh Branch  
Navy League of the U.S.  
National Assn. of Manufacturers

**Awards:** Outstanding Industrialist Award for Western Penn. - 1962  
Freedom's Foundation George Washington Honor Medal - 1961

## BIOGRAPHICAL DATA

ROY T. SESSUMS  
VICE PRESIDENT  
FREEPORT SULPHUR COMPANY

The experience of Roy T. Sessums includes college teaching and administration, active and reserve military duty with the U. S. Air Force, service as a state official at executive level, and executive duties with one of the country's largest mining firms.

A native of [REDACTED] Mr. Sessums [REDACTED] He was married in 1942 to the former Pearl Elizabeth [REDACTED] a native of Gatesville, Texas. They reside at 125 Magnolia Drive, Metairie (New Orleans), Louisiana. They have one daughter, Mrs. Josh M. Weaver, of Lake Charles, Louisiana.

He attended elementary, grammar, and high school in Pioneer, Louisiana. He received a bachelor of science degree in civil engineering from Louisiana Polytechnic Institute in 1935 and a master of science degree in civil engineering from Louisiana State University in 1936. He did advance study at the University of Minnesota in 1936-37.

He served as assistant professor of civil engineering at Louisiana Polytechnic Institute during the period 1937-40. In 1940 he was named Dean of the School of Engineering and Professor of Civil Engineering at Louisiana Tech. Mr. Sessums served in this post for 12 years, 1940-52, with military leave of absence during the period 1942-46.

In 1952, Mr. Sessums resigned from his academic post to accept appointment as Director of the Department of Public Works for the State of Louisiana with headquarters in Baton Rouge. As a member of the Governor's staff, he directed the operations of this organization in the following activities: state planning; housing; supervision of the Division of Aeronautics; flood control; drainage; water conservation; inland navigation, etc. The Department also serves as state engineer on all public works other than highways.

From 1955 to date, Mr. Sessums has been employed by Freeport Sulphur Company, currently serving as a vice president. His responsibilities include direction and supervision of public relations activities for the parent company and its several subsidiaries in the South, including liaison activities with local, state, and Federal governments, and internal administrative duties. He is also responsible for the company's environmental services throughout the United States.

Mr. Sessums entered active military service with a direct commission of first lieutenant in August, 1942, and served with distinction in both active and reserve duties, until his retirement in March, 1970. He accepted a reserve commission as a Lt. Colonel in the U. S. Air Force upon his discharge from active duty in April, 1946. He was promoted to major general in 1962. His Reserve assignments included Mobilization Assistant to the Commander, Air Force Systems Command, Andrews AFB; and a similar assignment at Hq Air Force Reserve, Robins AFB, Georgia. He served on various committees and boards, including the Reserve Forces Policy Committee, Headquarters U. S. Air Force, serving as Chairman of the Committee for two years; the Board of Visitors to the Air University (1965-68); and a three-year assignment as a member of the Department of Defense Reserve Forces Policy Board (1966-69).

He served on the President's Water Pollution Control Advisory Board (1967-68); was appointed by the President to membership on the Mississippi River Commission in 1968; and is serving as a director of the American Bank and Trust Company, Baton Rouge, Louisiana, and of Nuclear Systems, Inc., Dallas, Texas.

Mr. Sessums is a member of a number of civic, professional, and business organizations which include: American Society of Civil Engineers; Society of American Military Engineers; American Society for Engineering Education; National Society of Professional Engineers; Louisiana Engineering Society. He is a member of the Advisory Council of Loyola University's College of Business Administration.

He is a registered professional civil engineer and is serving as a member of the Louisiana State Board of Registration for Professional Engineers and Land Surveyors. He is presently serving as President of the National Council of Engineering Examiners which term will expire in August, 1973. He is listed in Who's Who in America; Who's Who in the Southwest; Leaders in Education; Who's Who in Engineering. He is a member of these fraternities: Phi Kappa Phi (scholarship); Omicron Delta Kappa (leadership); Tau Beta Pi (professional engineering society); and Lambda Chi Alpha (social).

His clubs include Engineers' Club of New Orleans; Petroleum Club of New Orleans; International House of New Orleans; Plimsoil Club of New Orleans; Lamplighter Club of New Orleans; City Club of Baton Rouge; Camelot Club of Baton Rouge; and Army-Navy Club of Washington, D. C.

Address: Home: 125 Magnolia Drive  
Metairie, Louisiana 70005

Business: P.O. Box 61520  
New Orleans, La. 70161

January, 1973

VERNON D. SEIFERT

March, 1976

PERSONAL

Residence: 563 Emerald Street  
New Orleans, Louisiana 70124

Marital Status: Married - Four Children

Home Telephone (504) 283-1284  
Tulane University " 588-5415  
Social Inquiry Associates " 522-3778

EDUCATION

Northwestern University, Chicago, Illinois - B.S. - Hospital Administration,  
1949

Northwestern University, Chicago, Illinois - All but thesis completed for  
M.S. - Hospital Administration

Tulane University, New Orleans, Louisiana - M.P.H. - Health Services  
Administration, 1971

PROFESSIONAL HISTORY

CURRENT.....Associate Professor, Tulane University, Health Services  
Administration, School of Public Health and Tropical Medicine, 200 South  
Liberty, New Orleans, Louisiana 70112

Principal Consultant, Social Inquiry Associates, Inc., Canal LaSalle Bldg.,  
1460 Canal Street, Box 13, New Orleans, Louisiana 70112

1971 - 1972....President and Chief Executive Officer, QualiCare, Inc.,  
P.O. Box 24309, New Orleans, Louisiana 70124

Assistant Professor, Tulane University, Health Services Administration,  
School of Public Health and Tropical Medicine, Hawthorne Hall, New Orleans,  
Louisiana 70112

1968 - 1971...Executive Director, New Orleans Area Health Planning Council, 802 Masonic Temple Building, 333 St. Charles Avenue, New Orleans, Louisiana

1963 - 1968...Executive Director, Regional Hospital Planning Board, 1010 Euclid Building, Cleveland, Ohio 44113

1954 - 1965...Administrator and Chief Executive Officer, Fairview General Hospital, 18101 Lorain Road, Fairview Park, Ohio

1951 - 1954...Assistant Administrator, Fairview General Hospital, 18101 Lorain Road, Fairview Park, Ohio

1949 - 1951...Assistant to the Medical Director and Director of Clinics, St. Luke's Hospital, Chicago, Illinois

1947 - 1949...Administrative Assistant, Evanston Hospital Evanston, Illinois

#### PROFESSIONAL SERVICE - CURRENT

Board of Directors - Children's Hospital, New Orleans  
Board of Directors - American Association of Comprehensive Health Planning, Alexandria, Virginia

#### PROFESSIONAL SERVICE - PAST

Volunteer and Information Agency, New Orleans, Louisiana: Member of Board and Treasurer  
Association of Area-wide Health Planning Councils: Member of Planning Committee  
University of Oklahoma Medical Center: Advisory Council Member, Mid-Continent Comprehensive Health Planning Educational Program  
Social Welfare Planning Council, New Orleans, Louisiana: Member of Board of Directors  
Visiting Nurses Association, New Orleans, Louisiana: Member of Board and Chairman of Planning Committee  
Comprehensive Health Planning, HEW, HSPMA, Washington, D.C.: Member of National Educational Program Review Committee  
Louisiana Goals Program: Chairman - Task Force on Health and Environmental Health  
Louisiana Consumers Council: Member of Sub-committee on Health and Environment  
New Orleans Ecology Center: Member of Special Study Committee  
Cleveland Hospital Council: President and Member of Various Committees.  
American Protestant Hospital Association: Treasurer and Member of the Board of Directors  
Ohio Hospital Association: Treasurer, Member of Board, and Executive Committee.  
Council on Health and Welfare, United Church of Christ: President and Executive Committee Member

Ohio League for Nursing: Member of Board of Directors  
Cleveland Council and League for Nursing: Treasurer and Member of the Board  
Welfare Federation, Cleveland, Ohio, Health Planning and Development Com-  
mission: Member of Comprehensive Mental Health Planning Committee  
Royal Society of Health, London  
Cleveland Hearing and Speech Center: Member of Board of Trustees  
Cleveland Health Museum: Member of the Board  
Cleveland "Health Goals" project. Member of the Steering Committee and  
Task Force on Institutional Planning  
Blue Cross of Northeastern Ohio, Cleveland, Ohio: Member of the Board and  
Committee on Research  
Joint Hospital Committee, Cleveland, Ohio: Member of the Board  
Other State, Local and National Hospital and Health Association Committees

#### PROFESSIONAL MEMBERSHIP

American College of Hospital Administrators: Fellow  
American Public Health Association  
American Hospital Association  
American Association for Comprehensive Health Planning  
Federation of American Hospitals  
Louisiana Hospital Association

#### PUBLICATIONS

"Relocation Gave Them Room to Grow," The Modern Hospital (January, 1957).  
"In This Disaster Plan, Student Nurses Are the Link Between the Patients  
and the Treatment Team," The Modern Hospital (February, 1957).  
"The Effective-Use of A Development Fund," The Modern Hospital (December,  
1960).  
"Disaster Plans in General Hospitals," The Bulletin of the Academy of  
Medicine of Cleveland (March, 1959).  
"The Case for A Professional Library," Hospitals (January, 1961).  
"What Is Accomplished by Developing A Separate Department of Inhalation  
Therapy?" Inhalation Therapy (December, 1960).  
"Meeting the Emergency Department Crisis," Hospitals (November, 1966).  
"Comprehensive Health Planning," Speech given at the American Protestant  
Hospital Association Annual Convention (January, 1968).  
"Changing Patterns of Financing Health Care Institutions," Speech given  
at Ketchum, Inc. Annual Meeting (August, 1967).  
"The Future of Health Care Institutions," Journal of the Council on Health  
and Welfare, United Church of Christ (Pending).  
"In Pursuit of Tomorrow," Framework for the Future, Vol. 1, Goals to Grow,  
New Orleans, Louisiana (April, 1971).  
"Health and Environmental Living," Report of the Health and Environmental  
Living Task Force, Goals for Louisiana (May, 1971).

- "It Makes No Difference - They Both Can Do Well," Speech given at the American Public Health Association Annual Meeting (November, 1973).
- "Review and Comment: Issues and Prospects" Prepared and presented at Seminar on Research in Health Planning, DHEW, Rockville, Maryland
- "Realities of Political Action for Church Related Health Care Institutions" Presented at the Annual Assembly of the Protestant Hospital Health and Welfare Assembly
- "Working Paper, A Model for Institutional Health Planning" Prepared for use in series of Seminars on Institutional Health Planning. Currently being expanded.
- Preparation of three chapters for inclusion in the Cajun Cookbook. A reference manual for Health Systems Agency Development under the terms of the Health Planning and Resources Development Act of 1974.
- "Potential Impact of the Law on the Nations Health Care System"
- "Transition from Comprehensive Health Planning to Health Planning and Resource Development"
- "Development of the Law in Congress"
- Author of Three Chapters in the Tulane University Home Study Course on "Introduction to Comprehensive Health Planning"
- Chapter 6: "Cutting Teeth - CHP's Growing Pains and Power"
- Chapter 7: "Capital Expenditure Review"
- Chapter 9: Where is CHP Going?
- "The New Health Planning and Resources Development Legislation, It's Impact on the Health System (P.L. 93-641)" Presented at the Distinguished Lecture Series, Ochsner Medical Foundation.
- "What is the Proper Role of the Investor Owned and Managed Hospital in the Present Day Health Care System?" A Position Paper presented at the American Public Health Association Annual Meeting.

#### BOOKS AND MANUALS

- Author of Models for Development of Procedures, Standards and Criteria - Review and Comment. Tulane University developed to assist Health Planning Agencies in their development of review and comment procedures, standards and criteria.
- General Editor and Author of the first Chapter "General Management Principles" Administrative Procedures and Agency Coordination, Tulane University. A manual designed to assist new Health System Agencies in their development and understanding of administrative procedures.
- As Principal Consultant to Social Inquiry Associates, extensive writing has been accomplished in connection with the projects successfully completed by Social Inquiry Associates. A brief summary of the projects completed or current, in progress is attached.

JOSEPH E. WALL

[REDACTED]  
[REDACTED]  
**MARRIED:** June 14, 1950 to former Marjorie L. [REDACTED]  
Three children - Joseph, Marjorie and John

**ACADEMIC DEGREE:** B.S. in Commerce, School of Business Administration  
Loyola University of the South

**CAREER:** January 1973 to Present: Acting Executive Director,  
Health Education Authority of Louisiana  
April 1970 - January 1973: Health Planning Officer, HEAL  
July 1963 - April 1970: Social Insurance Representative,  
Social Security Administration - DHEW  
January 1961 - July 1963: Social Insurance Administrator,  
District Manager, Fort Arthur, Texas, SSA-DHEW  
January 1959 - January 1961: Management Analyst, Baltimore,  
Maryland, SSA-DHEW  
July 1954 - January 1959: Supervisor, Social Security Claims  
Section, New Orleans, Louisiana, SSA-DHEW  
January 1951 - July 1954: Social Security Claims Representa-  
tive, SSA-DHEW  
October 1940 - January 1951: In charge of Service Section,  
Business Office, Southern Regional Research Laboratory,  
Department of Agriculture

Special Assignments:

February 1966 - December 1966: Office of Equal Health  
Opportunity  
February 1967 - August 1967: Office of Equal Employment  
Opportunity  
Social Security Liaison with:  
New Orleans Model City Program  
New Orleans Bureau of Vital Statistics  
Charity Hospital Medical Record Library  
La. Department of Education - Vocational Rehabilitation

**MILITARY SERVICE:** U.S. Army Air Corp, Active Duty, March - 1942  
March 1946, two years duty in India - CBI Theater

*Staff Resume*

Henry E. Markel, Jr., P.E.  
Manager, Power Engineering Division  
New Orleans Public Service Inc.

*Age*

47

*Registration*

Licensed Professional Electrical Engineer in Louisiana.

*Education*

B.S. in Electrical Engineering, Tulane University, 1956  
3 weeks Public Utility Management Course, Georgia Tech, 1973  
2 weeks Westinghouse Public Utility Engineering Conference, 1973  
2 weeks Controls and Computations in Power Systems, Clemson Univ., 1969

*Professional Associations*

Louisiana Engineering Society (LES)  
National Society of Professional Engineers (NSPE)  
Institute of Electrical and Electronics Engineers (IEEE)  
Power Engineering Society (PES) of IEEE  
Substations Committee of P.E.S.  
Tau Beta Pi, National Honorary Engineering Fraternity  
Eta Kappa Nu, National Honorary Electrical Engineering Fraternity  
Society of Tulane Engineers  
Engineers Club of New Orleans

*Experience*

After attending Tulane University from 1946 until January, 1948, Mr. Markel accepted a job at New Orleans Public Service Inc. (NOPSI) as a draftsman in the Electrical Engineering Division. During his years as a draftsman, he developed skills in construction work and in particular, became adept at working with electric control circuits.

In 1951, he was inducted into the U.S. Army and assigned to the Signal Corps. After basic training at Camp Gordon, Georgia, he was sent to Fort Monmouth, N.J. where he studied microwave radio repair. He returned to his unit in Camp San Luis Obispo, California in 1952. From then until his release from active duty in February, 1953, he was Non-commissioned officer in charge of plans and training.

After release from the Army, he rejoined NOPSI as a draftsman in the Electrical Engineering Division. He remained in this job until accepted by the Tulane School of Engineering in 1953.

Upon graduation in 1956, Mr. Markel accepted a position as an Assistant Engineer in the Electrical Engineering Division. His first assignment was to checkout the controls for NOPSI's first unit at the Michoud Generating Station. Although most of his assignments have been in control, relaying and telemetering work, he has also done foundation and structural design work associated with the installation of 13.8 kV feeders. He rose thru the various levels of engineer until in 1973 he was named Manager of the Electrical Engineering Division.

In December, 1975, the Electrical Engineering Division and the Mechanical Engineering Division were combined and a new division, the Power Engineering Division, was formed and Mr. Markel was named its Manager. The division has responsibility for all power plant design and installation as well as the design and installation of high voltage (230 kV down thru 13.8 kV) distribution and/or transmission substations.

*Tenure with Firm*

First employed as draftsman, March 1948. Left in September, 1953 to complete education. Continuous service since June, 1956.

*Staff Resume*

Martin L. Huber, P.E.  
Senior Mechanical Engineer, New Orleans Public Service Inc.

*Age*

56

*Education*

B.S. Mechanical Engineering, 1953  
Tulane University, New Orleans, La.

*Registration*

Louisiana

*Professional  
Associations*

American Society of Mechanical Engineers  
Instrument Society of America  
Louisiana Engineering Society

*Experience*

Mr. Huber is a registered professional engineer with 24 years of diversified experience in his specialty and association with other engineering disciplines. He has an extensive background in the design and operation of steam electric stations which includes all the associated equipment. His most recent assignment was project engineer of an extensive conversion of two steam electric stations to permit the continuous burning of No. 6 fuel oil which entailed the expenditure of \$24,000,000.

Mr. Huber served in the U.S. Navy for six years prior to, during and after World War II and for approximately one year during the Korean conflict. His highest rate was Machinist Mate 1st Class and he has had experience in the operation of ship board machinery including boilers, turbines, pumps, refrigeration equipment, etc. and the land based repair of diesel engines.

*Tenure with Firm* 24 years

*Staff Resume*

Martin J. Maier, P.E.  
Senior Electrical Engineer  
New Orleans Public Service Inc.

*Age*

58

*Education*

B.S. in Electrical Engineering, Tulane University, 1950  
Various short courses on Recovery Voltages and System Overvoltages,  
Civil Defense Development Courses (Tulane Univ.), Nuclear Science  
(University of New Orleans)

*Registration*

Registered Professional Electrical Engineer in Louisiana

*Professional  
Associations*

Louisiana Engineering Society (LES)  
Institute of Electrical and Electronics Engineers, Inc. (IEEE)  
Power Engineering Society (PES) of IEEE  
Representative to ANSI from Power Switchgear Comm. of PES  
Acoustical Society of America

*Experience*

During World War II, Mr. Maier served in the Asiatic-Pacific Theatre of war, his job being that of a cryptographer. In this capacity, he engaged in the compilation and mapping of intelligence reports and coded and encoded messages.

After release from active duty, he attended Tulane University. After graduation, he was employed by the Boeing Airplane Co., his work consisting of the support and installation of electrical equipment in aircraft. His work also involved modifications to the body of a plane to enable this plane to be used as a flying laboratory to evaluate the fire control system proposed for the new B-52.

Mr. Maier joined the Electrical Engineering Division of NOPSI in 1952 as an Assistant Engineer in corrosion prevention work for the steel gas mains and other underground structures of the system. In this position, he participated in gathering field data, evaluating it, and developing new corrosion mitigation methods and tools.

In 1961, Mr. Maier was relieved of his duties in the Corrosion Group and was assigned to perform design work associated with large high voltage substations. In this capacity, he prepared or supervised the preparation of drawings, specifications and instructions. His duties also consisted of evaluating alternative plans and preparation of annual construction budgets.

He has steadily progressed thru the various levels of engineer and in his present capacity supervises a group of six electrical engineers working on a variety of projects. He is also the company's expert on Noise and its limitation by OSHA.

*Tenure with Firm* 25 years

***Staff Resume***

**W. DAVID de LAUREAL, P.E.**  
President

***Age***

62

***Education***

B. S. Mechanical Engineering, 1934  
Louisiana State University, Baton Rouge, La.

***Registration***

Louisiana, Florida, Mississippi, Texas

***Professional  
Associations***

Consulting Engineers Council  
American Waterworks Association  
Society of American Military Engineers

***Experiences***

Mr. de Laureal, the founder of the firm, is a Registered Professional Engineer with extensive experience in all phases of the profession and corporation management. As President of de Laureal Engineers, Inc. he manages a staff of engineers, technicians, inspectors and clerical personnel for the design, construction and completion of a wide variety of municipal, industrial, commercial and Government and military projects.

Prior to founding the firm in 1946 he served as a Commissioned Officer and Post Engineer in the Corps of Engineers, U. S. Army, World War II. He served two and a half years on foreign duty in charge of design and construction of roads, docks, housing, water, cold storage, and ice plants; sewerage, air conditioning, lighting, electric generating and transmission systems, and one and a half years in the United States as Post Engineer on similar assignments.

***Staff Resume***

**H. WILLIAM HERBST, P.E.**  
Vice President

***Age***

53

***Education***

B. E. Civil Engineering, 1945  
M. S. Civil Engineering, 1965  
Tulane University, New Orleans, La.

***Registration***

Louisiana

***Professional  
Associations***

Fellow: American Society of Civil Engineers  
Consulting Engineers Council  
Louisiana Engineering Society

***Experience***

Mr. Herbst is a Registered Professional Engineer. He joined the firm after twenty years of professional experience in design and construction. For fourteen years he served a prominent consulting firm in various capacities -- the last years in responsible charge of general civil engineering projects including grade separation structures, rural and urban interstate highways, bridges, sewage systems, materials handling systems, runways and taxiways and various service facilities for government installations.

Prior to joining the firm, he was associated with another consulting firm for a period of fourteen years. The last five years of this time he served as department head in charge of design. His fourteen year tenure was spent in responsible charge of design of general civil engineering projects including various grade separation structures, railroad trackage and embankment, rural and urban interstate highways including interchange structures and bridges, pumping stations, sewage treatment plants, sewer collection system, materials handling systems, cryolite recovery plant, glass sand plants, runways and taxiways and various service facilities for government installations. He handled numerous reports and investigations.

His experience prior to that time was largely in the field of highway bridge design, and as resident engineer on large building projects. He also served as Division Officer, U. S. Navy just after his graduation, 1945.

***Staff Records***

**JOHN E. MORRISON, P.E.**

***Age***

58

***Education***

B. S. Mechanical Engineering, 1950  
Tulane University, New Orleans, La.

***Registration***

Louisiana

***Professional  
Associations***

Tau Beta Pi, National Honorary Engineering Fraternity

***Experience***

Mr. Morrison is a Registered Professional Engineer and has been in responsible charge of many major mechanical engineering projects involving fuel oil storage facilities, refrigeration, heating, air conditioning, steam, high temperature water, high temperature oil, foam fire protection, central utility plants and piping systems. His duties have involved both design and supervision, and he has served as project engineer on many projects. Major projects include air conditioning and ventilation system for the Tulane University School of Medicine, central utility plants at Loyola University and Louisiana State University in New Orleans, central high temperature water plant at NASA Mississippi Test facility, major modifications and renovations to NASA Michoud Operations manufacturing facility, oil unloading and storage facilities for Louisiana Power and Light Company.

His military service was with the U. S. Army Air Force Weather Service in India during World War II.

Mr. Morrison is also a Registered Fallout Shelter Analyst.

***Years with Firm***

25 years

<b>Staff Resume</b>	<b>GEORGE R. KETTERINGHAM, P.E.</b>
<b>Age</b>	54
<b>Education</b>	B.S. Electrical Engineering, 1943 Louisiana State University, Baton Rouge, La.
<b>Registration</b>	Louisiana
<b>Professional Associations</b>	Senior Member: Institute of Electrical & Electronic Engineers, Louisiana Engineering Society
<b>Experience</b>	<p>Mr. Ketteringham is a registered professional engineer with wide experience in the design and engineering of electrical systems for industrial, commercial, institutional and power distribution and generation projects. He has worked with public, private and military and government sectors throughout the East and Southeast U.S.</p> <p>As Manager of the electrical engineering department since early 1974, Mr. Ketteringham has supervised the design of electrical distribution and power systems for various facilities and large power users. He has also directed the design of electrical systems for water and sewage treatment plants, industrial plants, and marine facilities, as well as special electrical control and power systems and instrumentation systems.</p> <p>He has been electrical design engineer for many specialized facilities such as fuel oil storage and transfer, electrical heat tracing, sports lighting, bridge control and lighting, sewerage and drainage, plant rehabilitation and modification, decking, remote control and monitoring, communications, etc.</p> <p>Mr. Ketteringham served in the U.S. Navy as an instructor and course organizer in Naval Technical Training Schools.</p>
<b>Years with Firm</b>	2 years

***Staff Resume***

**NIKOLAI PETERSON, P.E.**

***Age***

55

***Education***

German Institute of Technology, 1950  
Stuttgart, West Germany

***Registration***

Louisiana

***Professional  
Associations***

American Society of Civil Engineers  
American Concrete Institute

***Experience***

Mr. Peterson is a Registered Professional Engineer and Land Surveyor. He supervised the high pressure grouting of the Moehne Water Dam in Germany, was Chief Supervisor of Construction for the U. S. Army in Germany (totaling over \$50 million). Mr. Peterson was also in charge of designing and supervising the construction of a cantonment involving dependents housing on Nellingen Airfield, including runways, runway lighting, taxiways, hangars, access roads, drainage and billets, shops, messhalls and a complete sewage plant, water supply system. As design engineer he designed pre-stressed concrete bridges and structures. Mr. Peterson came to the United States in October 1955 and worked for three years in Pittsburgh, Pa., designing and checking foundations for steel mills and chemical plants. He took part in designing the Royal Orleans Hotel, New Orleans, La., and different hospitals and institutional buildings, plants and bridges of the Interstate Highway System.

Mr. Peterson designed the bascule span for the Harvey Canal Bridge, Louisiana, which won the Prize Bridge Award in the movable span category 1973 in the annual national competition conducted by the American Institute of Steel Construction.

He also designed the high level bridges over Bayou Barataria, replacing the existing Wagners Ferry Bridge and Kerners Ferry Bridge, as well as a bridge over Bayou Perot; all in Louisiana.

He designed an unstiffened suspension bridge with 11,230' main span and supervised the erection for Standard Fruit, Costa Rica.

Among other activities, he was in charge of the design for a new wharf for the Naval Station in Algiers, Louisiana and designed oil unloading docks and pipe bridges for power generating stations.

Prior to joining de Laureal Engineers, Inc., he was Structural Project Engineer with a large consulting engineering firm in New Orleans.

**Staff Resume:** BHOLANATH VINAYAK DHUME

**Firm:** de Laurel Engineers, Inc.

**Project Function and Level of Responsibility:** Planning/System Design

**Experience:** Eight (8) years of experience in architectural design, urban design, town planning, construction drawings and construction supervision in India and U.S.A. Mr. Dhume is the past recipient of the Claude Batley Prize in Design. He is presently involved in the planning and design of transportation improvements in the New Orleans Metropolitan Area.

**Employment History:**

- 1975 - Pokorny & Pertz, Architects and Planners - architectural planning activities such as urban design, density determinations and analysis, transportation planning, income studies, etc.
- 1969 - Public Works Department, Panaji-Goa, India - architectural design, construction drawings and construction supervision.
- 1968 - J. R. Rajino De Sousa, Architects - architectural drafting and detailing.

**Education:** B.S. Architecture, 1963, Sir J. J. College of Architecture, Bombay, India  
M.S. Architecture, 1975, Pratt Institute, Brooklyn, New York.

**Specific Assignment in this Project:** Mr. Dhume will be providing master planning activities, system design, analysis and evaluation for both the 1980 plans, as well as the long range master plans for the storage, processing and distribution systems.

*Staff Resume*

**THOMAS W. SCHNADELBACH**

*Age*

43

*Education*

B. S. Landscape Architecture, 1959  
Louisiana State University, Baton Rouge, La.

*Registration*

Louisiana

*Experience*

Mr. Schnadelbach is a Licensed Landscape Architect and Certified City and Urban Planner. He has had over seventeen years experience in City Planning and Landscape Architecture consisting of preparing, presenting, designing and supervising the planning, analysis, design, documentation, construction drawings, and specifications of comprehensive city plans, feasibility studies, urban renewal projects, master plans, government installation plans, landscape development plans, subdivision development plans and industrial development plans. Managerial experience in project control and production of city planning, urban renewal and Landscape Architectural work for the purpose of pert analysis projections, budget submissions and implementation planning.

He has participated in City and Urban Renewal planning for small and large cities in Louisiana, Mississippi, Tennessee and Alabama consisting of feasibility studies, comprehensive city plans, central business district studies, Lake reservoir recreational plans, college and institutional campus plans, major thoroughfare plans and industrial development plans of a consulting nature.

Mr. Schnadelbach has also participated in planning of industrial sites to maximum utilization of land for the optimum relationship of functions and aesthetic arrangement of development and planning for major routes of transportation for cities, towns and government installations in Louisiana, Mississippi, and Alabama.

Immediately prior to joining the firm Mr. Schnadelbach was the Chief Planner for the Regional Planning Commission for Jefferson, Orleans, St. Bernard and St. Tammany Parishes, Louisiana. He has also served as Governor's Appointee to the Louisiana Landscape Architects Selection Board.

*Tenure with Firm*

Associated - 4 years; Permanently - 6 months

*Staff Resume*

**SPENCER G. SMITH, P.E.**

*Age*

54

*Education*

B. E. Mechanical Engineering, 1942  
Tulane University, New Orleans, La.

*Registration*

Louisiana, Mississippi, Alabama, Texas, Georgia

*Professional  
Associations*

American Society of Mechanical Engineers  
National Society of Professional Engineers  
Louisiana Engineering Society

*Experience*

Mr. Smith is a Registered Professional Engineer with over 30 years of diversified experience in his specialty and association with other engineering disciplines. He has an extensive background in mining and petroleum and chemical plant design and construction management. He has provided consultant and design services for pumping stations, lift stations, sewage and water treatment facilities, wharves and docks, material handling systems, piping systems for various applications, and marine and naval engineering.

Prior to joining the firm, Mr. Smith has been project engineer for a \$15,000,000 sulphur mining plant, a \$6,500,000 sulphur mine and a \$35,000,000 nickel and cobalt mining and processing plant which included a deep-water port and a townsite for 4000 people; a sizeable steam power plant and diesel power plant were also included in this project.

Mr. Smith served as ship repair officer, U. S. Navy during World War II in Africa, Italy and England.

*Tenure with Firm*

6 months

**RESUME OF JAMES MORELAND HEURT**  
**Associate Professor of Chemical Engineering**  
**Tulane University**  
**New Orleans, Louisiana 70118**

**Personal**

██████████ and raised in ██████████

**Education**

B.A. in May 1964. Rice University, Houston, Texas.  
B.S.Ch.E. in May 1964. Rice University, Houston, Texas.  
M.A. in April, 1965. Princeton University, Princeton, New Jersey.  
Ph.D. in June, 1970. Princeton University, Princeton, New Jersey.  
Publications 1a, 1b, 2  
Post-Doctoral, 1971. Yale University, New Haven, Connecticut.  
Publications 3-6  
Various short courses since 1971.

**Employment**

1962 as Chemical Engineer (summer) for du Pont Plant, Houston, Texas.  
1963 as Chemical Engineer (summer) for Standard Oil of California,  
Taft, California.  
1964 as Chemical Engineer (summer) for du Pont Plant, East Chicago, Indiana.

1966 as Associate Professor and Teaching Intern  
to Prairie View A. and M. College,  
1970 Electrical Engineering Department, Prairie View, Texas.  
(Teaching Internship sponsored by Woodrow Wilson National Fellow-  
ship Foundation).

Activities - Prepared proposal for the establishment of Chemical  
Engineering Department.  
Courses taught: Engineering Orientation, Network  
Theory (Basic Circuits, Linear Systems Analysis,  
Network Synthesis), Control Systems.

1970 as Lecturer and Applied Research Staff Scientist  
to Yale University,  
1971 Department of Engineering and Applied Science, New Haven, Connecticut

Activities - Theoretical calculations in chemically reactive  
systems; classical trajectories, transition state  
theory.  
Courses co-taught: Transport processes laboratory,  
chemical kinetics (graduate).

Resume of James Moreland Henry

Employment continued

1970 as Chemical Research Engineer and Branch Chief  
to Pittsburgh Energy Research Center,  
1976 U.S. Energy Research and Development Administration (U.S. Bureau  
of Mines prior to reorganization Jan. 1975), 4800 Forbes Avenue,  
Pittsburgh, Pennsylvania 15213

Activities - Mathematical Modelling of nitrogen oxides  
kinetics in coal combustion.  
Managing project in coal combustor development  
for magnetohydrodynamic power generation.

1976 as Associate Professor of Chemical Engineering,  
to Tulane University  
Present New Orleans, Louisiana 70118.

Activities - Teaching chemical kinetics, thermodynamics, energy  
conversion, air pollution.  
Research in air pollution chemistry and combustion  
reaction kinetics.

Professional Activities

Member of A.I.Ch.E., A.A.A.S., Sigma Xi, Tau Beta Pi, Phi Lambda Upsilon.  
A.I.Ch.E. Pittsburgh Local Section, Treasurer 1973-75; Secretary 1975-1976.

Publications and Presentations

1. "Molecular Scattering Cross-Sections and the Intermolecular Potential,"  
Ph.D. Thesis, Princeton University, December, 1969. Presented as  
"Fourier Inversion of Total Cross-Section Data" 8th International  
Conference on Physics of Electronic and Atomic Collisions, Belgrade,  
Yugoslavia, Vol. 1 (1973) (with Andres and Others).
2. "Improving College Teaching in Chemical Engineering," Chem. Eng'g. Ed.  
Summer, 1972, p. 132.
3. "Molecular Dynamics of the Hydrogen-Iodine Reaction System," Chem. Phys.  
Lett., v. 20, No. 1 (1 May 1973), p. 139. (with Anderson and Jaffe)
4. (With Jaffe and Anderson) "Variational theory of reaction rates:  
Application to Fluorine-Hydrogen," J. Chem. Phys. v. 59, No. 3  
(1 August 1973), p. 1128.
5. (With Anderson and Jaffe) "Note on the hydrogen-iodine reaction system,"  
J. Chem. Phys., v. 60, No. 9 (1 May 1974), p. 3752.
6. (With Jaffe and Anderson) "Molecular Dynamics of Hydrogen Iodine and  
Hydrogen-Iodine," JACS (Dec. 1975)
7. "No Emissions in MHD Plants with Staged Air Addition," Presented at  
OCR-MHD Contractors Meeting, July 1973, Bruceton, Pa.
8. "Coal Combustor Development for MHD Plasma Generation," Presented  
at OCR-MHD Contractors Meeting, Jan. 1973, Gaithersburg, Md.  
E-1.2

*Staff Resume*

**C. H. GOLOSMITH, P.E.**  
Senior Vice President and Secretary-Treasurer  
Orr-Schelen-Mayeron & Associates, Inc.

*Education*

BS, South Dakota State University, Vermillion,  
South Dakota  
The University of Washington, Seattle, Washington  
South Dakota School of Mines and Technology,  
Rapid City, South Dakota

*Registration*

Minnesota

*Professional  
Associations*

Minnesota Society of Professional Engineers  
Minnesota Consulting Engineers Council  
Associate Member of Wisconsin Municipal Utilities Assn.  
Associate Member of Minnesota Municipal Utilities Assn.  
Associate Member of Iowa Municipal Utilities Assn.  
Associate Member of Florida Municipal Utilities Assn.  
Associate Member of Illinois Utilities Assn.

*Experience*

Mr. Goldsmith is a registered mechanical engineer and has been active as a consulting engineer in the power plant field for over 25 years.

His experience encompasses design, plan preparation and supervision, specifications and field inspection for steam turbines and boilers, diesel generation, gas turbine installation, central air conditioning installation, and equipment tunnels for clients in both the private and public sectors.

Mr. Goldsmith joined OSM in 1959, became vice president in 1969, and was named a senior vice president in 1972. He is in charge of the company's mechanical, electrical, and power divisions.

**Staff Resume**    **LAWRENCE D. WHALEN, P.E.**

**Education**    B.S.M.E., University of Minnesota. Post graduate work in the machine design of aircraft jet engines, University of Minnesota.

**Registration**    Minnesota

**Experiences**    Mr. Whalen was employed by Northwest Airlines, Inc., St. Paul, Minnesota, as Technical Asst. to the Supt. of Aircraft Maintenance. His position involved special tests, research, and development of aircraft components. He assisted in the setting up and supervision of Production Control and Methods Unit within the maintenance department.

Mr. Whalen became an engineer for facilities in the Twin Cities for Northwest Airlines. This position required the supervision of plant maintenance shop personnel, including responsibility for repair and maintenance of all ground equipment, buildings and grounds. He was later transferred to the West Coast in the same capacity. He also supervised construction of twenty company-owned houses in Anchorage, Alaska, as well as necessary facilities at the Elmendorf Field, Anchorage, Alaska.

Mr. Whalen was employed by Ellerbe Architects/Engineers/Planners as a mechanical engineer. In this capacity he specialized in the design of Central Heating-Cooling Plants, Power Plants and Industrial Plants. This work included all allied systems such as water supply, water treatment, sewage treatment, pollution control, energy distribution systems & instrumentation. Economic analysis and feasibility studies were usually performed at the outset of the projects to determine the type of system and energy source most economically suited. He was a project manager for twenty years in this area of work.

Mr. Whalen was promoted to a new position as Manager of Construction Budget Control. He was commissioned to set up and manage this new department to properly monitor and control costs of projects as they moved through the design process from inception to bid. He researched the availability and adaptability of computer assisted cost estimated techniques available and contracted for and set up the C.S.E.I. of Dallas, Texas, system within the office.

Mr. Whalen managed this department which consisted of four estimators and cost control personnel.

In 1974, Mr. Whalen was employed by 3 M Company through Dacon Engineering and Service Company as Project Engineer representing 3 M as a liaison engineer with consultants preparing a Long Range Development Plan for a 560 acre Research Center. He also acted as Project Engineer in the design of a small heating cooling plant and the design of the installation of a 5,000 tons refrigeration machine.

Then, Mr. Whalen became a self-employed consultant for mechanical engineering and building systems, cost estimating and control.

He was employed by Ellerbe Associates as an Engineer Marketing Consultant. This position involved marketing surveys in a five state area developing an engineering marketing plan and budget and preparing proposals for engineering work as well as client contact.

*Staff Resume*

**JAMES H. KUNDE**

Engineering Technician  
Orr-Schelen-Mayeron & Associates, Inc.

*Education*

AA, University of Minnesota, Minneapolis, Minnesota  
Technical Aide Certificate, University of Minnesota,  
Minneapolis, Minnesota

*Experience*

Mr. Kunde is an engineering technician and has been active in the consulting engineering field for the past 25 years, and is a member of OSM's Power Systems Division.

His experience includes design, plan preparation, and specifications for power plant and heating plant equipment for universities, colleges, hospitals, state institutions, and private industry. Other work includes contract preparation, engineering proposals, reports, feasibility studies, field inspections, and conducting or attending construction meetings for OSM's Power System Division.

Mr. Kunde joined OSM in 1959 and has been employed in a full time basis since this date.

*Staff Resume*

**GARY L. TOSEL E.I.T.**  
Design Engineer  
Orr-Schelen-Mayeron & Associates, Inc.

*Education*

B.M.E., Mechanical Engineer, University of Minnesota,  
Institute of Technology

*Professional  
Associations*

Associate Member  
Minnesota Society of Professional Engineers  
National Society of Professional Engineers

*Experiences*

Mr. Tosel is a registered engineer-in-training with 4 years experience in power and heating plant design. As a design engineer of OSM's Power Systems Division, he prepares plans and specifications for approval and is involved with the preparation of reports for feasibility studies and electrical rate studies.

His experience includes design, plan preparation and specifications for boilers, electrical generation and pollution control systems for municipalities, universities and private industry.

His experience prior to joining OSM includes maintenance and repair of marine propulsion engines and electrical generators.

*Staff Resume*

**MILTON W. KOELSCH, P.E.**  
Vice President  
Orr-Schelen-Mayeron & Associates, Inc.

*Education*

Milwaukee School of Engineering

*Registration*

Minnesota and Wisconsin

*Professional  
Associations*

American Society of Heating, Ventilation, and  
Air Conditioning Engineers  
Consulting Engineers Council

*Experience*

Mr. Koelsch is a registered mechanical engineer with long experience in the design of mechanical systems for all types of projects. As chief of DSM's mechanical engineering division, he supervises the engineering and design of heating, ventilation and air conditioning system for all projects consistent with energy conservation codes, available technology and project requirements.

His experience includes the design of heat recovery systems, warm air systems, large boiler plants and large air conditioning systems for hospitals, high rise complexes and shopping centers and various office buildings, schools, industrial plants, warehouses and recreational facilities. Projects include the North Memorial Medical Center in Minneapolis, a lens grinding manufacturing plant in St. Cloud, Minnesota, operations and storage facilities for the U.S. Post Office, and maintenance facilities for the City of Monticello.

Mr. Koelsch's previous experience includes commercial heating and sheet metal engineering.

***Staff Resume***

**JOHN T. ELLIOTT, JR., P.E.**

***Education***

U.S.E.E., Michigan State University, East Lansing, Michigan. Post Graduate work on M.B.A. at the University of Minnesota.  
Class A Master Electrician's License

***Registration***

Minnesota

***Professional Associations***

Institute of Electric & Electronic Engineers

***Experience***

Mr. Elliott joined QSM in 1977 as a project engineer. As such, he is charged with the total electrical project responsibility including coordination of the project, design, drawings, and specifications.

Prior to 1977, Mr. Elliott worked for Ellerbe Architects/Engineers/Planners in Minneapolis. During his tenure with Ellerbe, Mr. Elliott worked on many projects as a design engineer and as a project engineer. As a design engineer, Mr. Elliott worked on the Conrad H. Hilton Laboratory, the Mayo Foundation Guggenheim Life Science Building, and the Mayo Medical School Library Remodeling - all were located in Rochester, Minnesota. In addition he worked on the State Farm Southern Regional Office in Costa Mesa, California, and the Landmark One Office Building in Bloomington, Minnesota.

As a project engineer with Ellerbe, Mr. Elliott's experience was even more varied. He worked on the North-western Bell Market Street Addition in St. Paul, Minnesota. In addition, he worked on several State Farm Office Additions, located in Colorado, Oregon, Michigan, and Florida. Mr. Elliott had total electrical project responsibility for the coordination, design, drawings, and specifications for the Los Angeles County/University of Southern California Cancer Hospital and Research Institute in Los Angeles, California. This building was a new hospital and research facility. Construction cost was 35 million dollars. Mr. Elliott was the project engineer for the Roseville Radiation and Therapy Addition and Alterations for the Roseville Community Hospital in Roseville, California and he was also project engineer for the East Campus High Voltage Distribution System Revisions at Carleton College in Northfield, Minnesota.

Mr. Elliott worked on the design development for the Amtrak Passenger Station for the Twin City area. This project encompassed the design development of the passenger building and the primary and secondary distribution for providing the power requirements of the trains.

**Staff Resume**      **LLOYD V. BELING, PE**  
Associate  
Orr-Schelen-Mayeron & Associates, Inc.

**Education**      BS, Civil Engineering, North Dakota State University  
MS, Civil Engineering, University of Minnesota

**Registration**      Minnesota, Wisconsin, North Dakota and South Dakota

**Professional Associations**      Minnesota Society of Professional Engineers  
American Concrete Institute  
American Society of Civil Engineers

**Experience**      Mr. Beling has been a registered civil engineer in the field of structural engineering for seventeen years. His experience includes the design, preparation of plans and specifications, supervision and field inspection for buildings (including utility plants, hospitals, schools, hotels, penal institutions and high-rise housing to 14 stories), bridges of all types, and special structures (including retaining wall and piling, and diversion manholes, flume chambers, and lift stations).

                         Prior to coming to OSM, he designed highway bridges for the Minnesota Highway Department, planned hospitals in Minneapolis, Fairmont, Fridley, and Coon Rapids, and constructed high-rise apartments and apartment complexes. He has also designed warehouses, garages, clinics, office buildings, industrial plants, power plants, and water treatment, water storage and sewage treatment plants.

                         As chief structural engineer with OSM, Mr. Beling provides structural design for all office projects, including plans, specifications, inspections, estimates and consultations.

**Nancy E. Clanton, E.I.T.**

Orr-Schelen-Mayeron & Associates, Inc.

*Education*

B.S. Architectural Engineering Electrical Major  
University of Colorado Boulder, Colorado

*Professional*

*Associations*

National Society of Professional Engineers  
Illuminating Engineering Society

*Experience*

Ms. Clanton is a registered engineer-in-training with DSM. She has had experience in the design and engineering of lighting, power, and communications systems for buildings and landscapes. Her electrical systems' designs have been done for schools, recreation centers, hospitals, city halls, and commercial buildings.

Recently Ms. Clanton has designed electrical systems for the Ah-Gwah-Ching Indian Reservation boiler room, located in Ah-Gwah-Ching, Minnesota. She also designed the electrical system for the University of Minnesota, Duluth, boiler room. Ms. Clanton was the project engineer for the standby generators for the Metropolitan Waste Control Commission Change Proposal lift station. Her recent landscape lighting design experience involved the Monticello, Minnesota, city hall and civic center, a project where there was particular emphasis on aesthetic and functional illumination.