

ENERGY ENGINEERING ANALYSIS PROGRAM (EEAP)

ENERGY SAVINGS OPPORTUNITY SURVEY (ESOS)

FORT RUCKER, ALABAMA

EXECUTIVE SUMMARY

1987

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EXECUTIVE SUMMARY

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1. INTRODUCTION

This report presents the results and recommendations of an Energy Savings Opportunity Survey performed under the Energy Engineering Analysis Program (EEAP) at Fort Rucker, Alabama.

The report consists of an executive summary and six volumes. The Executive Summary presents a brief overview of the entire report.

Volume I includes the following five sections.

Section 1 describes the general features of the energy study and the methods used to accomplish the work.

Section 2 provides a general description of the present conditions of the facilities considered in this survey.

Section 3 summarizes prior energy studies.

Section 4 describes methods of analysis used to evaluate each Energy Conservation Opportunity (ECO).

Section 5 contains the recommendations and conclusions of the Energy Savings Opportunity Survey (E.S.O.S.).

Appendix A includes a copy of the Energy Savings Opportunity Survey scope of work.

Volumes II and III include a complete description of each ECO with supporting calculations.

Volume IV includes a complete description of each Energy Monitoring and Control System (EMCS) related ECO with supporting calculations.

Volume V consists of project documentation developed for feasible ECO's (SIR greater than or equal to one).

Volume VI consists of EMCS project documentation developed for feasible EMCS ECO's (SIR greater than or equal to one).

2. PROJECT APPROACH

The field survey was accomplished by a multi-discipline team of engineers from the Engineering Division at the Mobile District. Energy conservation opportunities provided on the ECO checklist (Table ES-1) were grouped into categories by discipline for investigation and project development prior to the site visits.

A meeting was held with the DEH and his utility/energy staff to discuss specific requirements for gathering field data, to coordinate activities, and

to introduce the study team to the staff. Arrangements were made to obtain building drawings and energy utilization records. Areas of potential energy savings opportunities were discussed in order to plan strategy and procedures. Each ECO was investigated by team members in accordance with the checklist provided. Data was collected by direct investigation and measurement. Available construction drawings were obtained for evaluation and analysis of ECO's.

TABLE ES-1
ECO CHECKLIST

BUILDING NUMBER

ARCHITECTURAL

1. REDUCE GLASS AREA:	106	113	2908	9224	9227	20020	30101	40110	50101
2. VESTIBULES:	106	113	2908	9224	9227	20020	30101	40110	50101
3. SOLAR FILMS:	106	113	2908	9224	9227	20020	30101	40110	50101
4. INSULATED PANELS:	106	113	2908	9224	9227	20020	30101	40110	50101
5. CAULKING:	106	113	2908	9224	9227	20020	30101	40110	50101
6. WEATHER STRIPPING:	106	113	2908	9224	9227	20020	30101	40110	50101
7. DOUBLE GLAZING:	106	113	2908	9224	9227	20020	30101	40110	50101
8. STORM WINDOWS:	106	113	2908	9224	9227	20020	30101	40110	50101
9. INSULATION:	106	113	2908	9224	9227	20020	30101	40110	50101

ELECTRICAL

10. HIGH EFFICIENCY MOTOR REPLACEMENT:									
11. IMPROVE POWER FACTOR:									
12. EFFICIENT LIGHTING:	106	113	2908	9224	9227	20020	30101	40110	50101
13. REPLACE INCANDESCENT W/ FLUORESCENT:	106	113	2908	9224	9227	20020	30101	40110	50101
14. REDUCE LIGHT LEVELS:									
15. TRANSFORMER LOADING:									
16. TRANSFORMER OVERVOLTAGE:									
17. REDUCE STREET LIGHTING:									

MECHANICAL

HOT WATER									
19. WATER HEATR INSULATION:	106	113	2908	9224	9227	20020	30101	40110	50101
20. WATER HEATR TEMP CONTROL:	106	113	2908	9224	9227	20020	30101	40110	50101
21. WATER HEATER SHUTOFF:	106	113	2908	9224	9227	20020	30101	40110	50101
22. LOWER DOMESTIC HW TEMP:	106	113	2908	9224	9227	20020	30101	40110	50101
23. HOT WATER BOOSTERS:	106	113	2908	9224	9227	20020	30101	40110	50101
GENERAL AIR CONTROL									
27. CHANGE TO VAV SYSTEM:	106	113	2908	9224	9227	20020	30101	40110	50101
28. RANGE HOOD SHUTOFF:	106	113	2908	9224	9227	20020	30101	40110	50101
29. KITCHEN MAKEUP AIR:	106	113	2908	9224	9227	20020	30101	40110	50101
30. POS KITCHEN PRESSURE:	106	113	2908	9224	9227	20020	30101	40110	50101
31. AIR CURTAINS:	106	113	2908	9224	9227	20020	30101	40110	50101
34. SEAL AIR HANDLER UNITS:									
35. ECONOMIZER CYCLE:	106	113	2908	9224	9227	20020	30101	40110	50101
36. BALANCE HVAC SYSTEM:	106	113	2908	9224	9227	20020	30101	40110	50101

BASEWIDE
AIRCRAFT HANGARS

BASEWIDE
BASEWIDE
BASEWIDE

BUILDING NUMBER

MECHANICAL (CONTINUED)

HVAC SYSTEM CONTROL

38. UPGRADE HVAC CONTROLS:	106	113	2908	4510	4511	9224	9227	20020	30101	40110	50101	50105
39. DINING ROOM OPERATIONS:	106	113	2908			9224	9227	20020	30101	40110	50101	
40. HVAC OPERATIONS:	106	113	2908			9224	9227	20020	30101	40110	50101	
41. EMCS:	106	113	2908			9224	9227	20020	30101	40110	50101	
44. NIGHT SETBACK CONTROL:	106	113	2908			9224	9227	20020	30101	40110	50101	

MISCELLANEOUS

46. INFRARED HEATERS:	106	113	2908			9224	9227	20020	30101	40110	50101	
47. SOLAR WATER HEATING:				4605								
48. WOOD CHIP/REFUSE MIX:												
49. PIPE INSULATION:	106	113	2908	5202	5205 5206	9224	9227	20020	30101	40110	50101	
50. FIX LEAKING CW PUMP:												
51. STOCK ROOM VENTILATION:								20020				

INCINERATOR

HEAT RECOVERY

52. GENERAL:	106	113	2908			9224	9227	20020	30101	40110	50101	
53. HOT REFRIG. GAS:												
54. DISHWASHER:	106	113	2908			9224	9227	20020	30101	40110	50101	
55. KITCHEN EXHAUST:	106	113	2908			9224	9227	20020	30101	40110	50101	
56. HYDRULIC SYS HEAT RCVRY:			4901									

BOILER

57. REVISE BOILER CONTROLS:	311	1102	4701	6021	8795							
58. BOILER TRIM CONTROL:	311	1102	4701	6021	8795							
59. RETURN CONDENSATE:	311	1102	4701	6021	8795							
60. INSULATE STEAM LINES:	311	1102	4701	6021	8795							

3. RESULTS AND RECOMMENDATIONS

This study produced projects which will result in energy dollar savings of \$95,564 per year. Total estimated implementation cost for all recommended projects is \$425,178. The simple payback for all recommended projects is, therefore, 4.45 years. It should be noted that neither projects arising from the Black and Veatch study nor projects with redundant energy savings were included in these figures.

Figure 1 (page ES-8) shows graphically the energy savings predicted by the ESOS as a fraction of the total Fort Rucker energy usage (including all facilities under Fort Rucker jurisdiction). Figure 2 (page ES-9) shows the cumulative dollar savings predicted by the ESOS compared to the construction cost over a 25 year period. Note that the composite payback is indicated graphically between years 5 and 6.

The recommended projects are summarized in Tables ES-2, ES-3, and ES-4 (pages ES-10 through ES-18). Table ES-2 is organized by building then by descending SIR. Table ES-3 is organized by project then by descending SIR. Table ES-4 is organized by descending SIR. These tables include only the projects that have a savings to investment ratio (SIR) greater than one. These tables include annual energy savings, annual dollar savings, simple payback in years, savings to investment ratio (SIR), contract and cost.

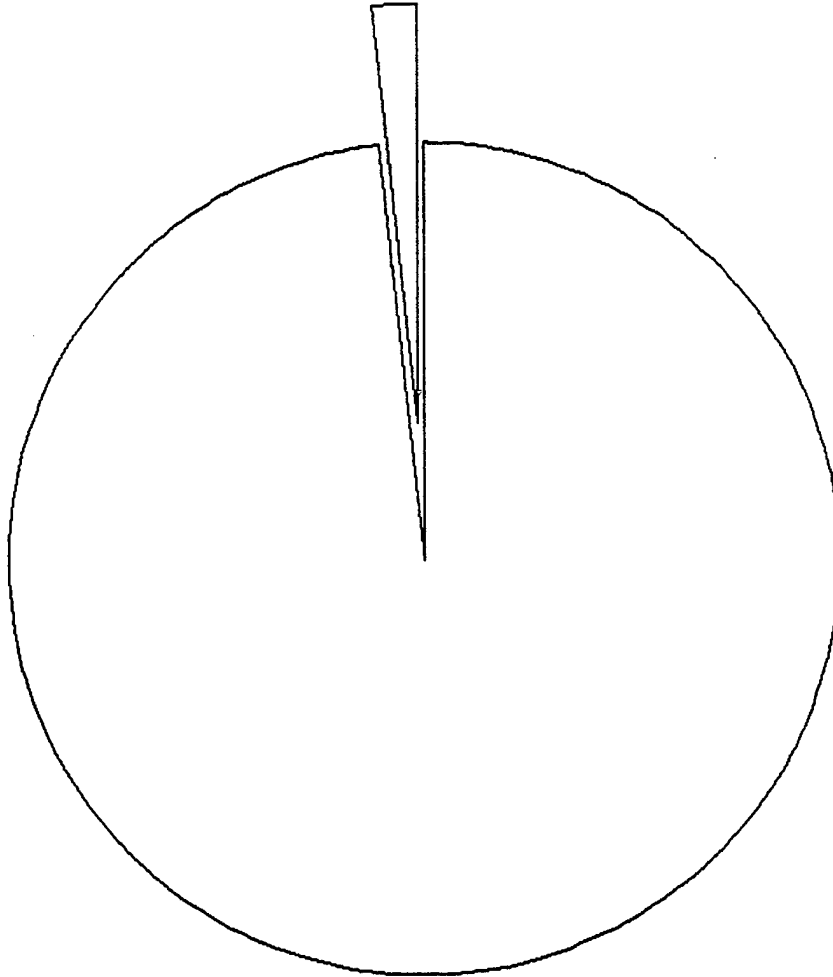
With the exception of the EMCS energy conservation opportunities, all energy conservation opportunities are summarized in Table ES-5 (page ES-19). The results for the EMCS energy conservation opportunities are summarized in Table

ES-6 (page ES-30). The remarks column indicates whether or not the project is recommended. If the project was not evaluated the remarks column will briefly state the reason.

Updated results of the Black and Veatch Basewide Energy Systems Plan (December 1982) are included in this study.

E.S.O.S. ENERGY SAVINGS

VS TOTAL FT RUCKER ENERGY USAGE
E.S.O.S. ENERGY SAVINGS (1.7%)



TOTAL FT RUCKER ENERGY USAGE (98.3%)

FIGURE 1

E.S.O.S. ENERGY DOLLAR SAVINGS

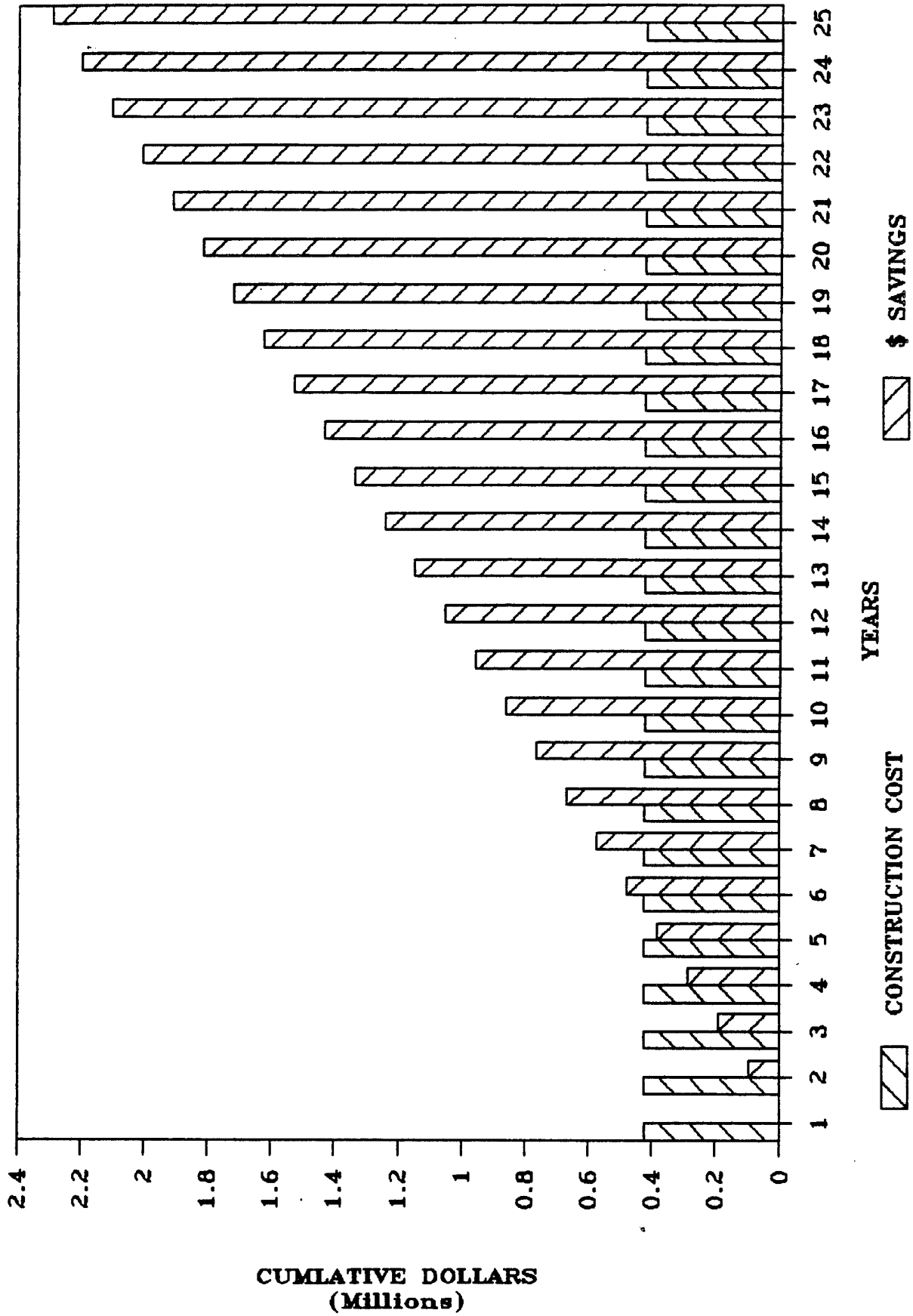


FIGURE 2

TABLE ES-2

ECO SUMMARY OF RECOMMENDED PROJECTS
ORGANIZED BY BUILDING NUMBER THEN BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
	106 44.00	NIGHT SETBACK	190.0	767.0	0.60	19.32	457
	106 19.00	WATER HEATER INSULATION	10.0	38.2	0.71	12.93	27
	106 22.00	LOWER DOM HW TEMP	24.0	41.1	1.22	8.02	50
***	106 23.00	HW BOOSTERS	69.0	263.0	1.27	5.29	333
***	106 49.00	PIPE INSULATION	32.4	123.4	2.67	4.50	330
	106 2.10	VESTIBULE-EAST	14.2	60.0	3.83	4.28	230
	106 40.00	HVAC OPERATIONS	31.8	95.0	0.32	3.12	30
	113 40.00	HVAC OPERATIONS	341.4	1271.0	0.02	42.71	30
	113 35.00	ECONOMIZER CYCLE	1595.1	6061.0	0.32	26.36	1955
	113 22.10	LOWER DOM HW TEMP-RESTRMS	12.0	2.4	20.49	6.18	50
	113 44.00	NIGHT SETBACK	296.0	1051.0	3.47	3.41	3652
	113 41.13	PKG 13-EMCS	0.0	6214.0	0.00	4.54	12421
	113 27.00	CHANGE TO VAV SYSTEM	2010.7	7661.0	2.56	3.32	19639
	113 31.00	AIR CURTAINS	43.0	186.4	8.13	1.98	1515
	113 52.00	KITCHEN HEAT RECOVERY	81.0	462.0	10.97	1.27	5067
	311 60.01	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228
	311 60.03	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228
	311 60.06	INSULATE STEAM LINES	15.0	73.0	2.88	6.67	210
	311 60.05	INSULATE STEAM LINE	30.0	143.0	2.94	6.55	420
	311 60.04	INSULATE STEAM LINES	24.0	116.0	3.32	5.72	385
	311 60.02	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175
	2908 40.00	HVAC OPERATIONS	191.8	701.0	0.04	23.53	30
	2908 22.00	LOWER DOM HW TEMP-KITCHEN	16.0	20.8	2.40	11.03	50
	2908 41.13	PKG 13-EMCS	0.0	6876.0	0.00	5.03	12421
	2908 35.00	ECONOMIZER CYCLE	765.3	2916.0	2.18	3.91	6346
	2908 27.00	CHANGE TO VAV SYSTEM	1141.3	4348.0	2.82	3.01	12274
	2908 31.00	AIR CURTAINS	78.0	337.0	8.80	1.66	2967
	2908 6.00	WEATHER STRIPPING	5.2	22.0	4.14	1.09	91
	4511 6.00	WEATHER STRIPPING	14.2	60.0	2.48	1.83	149
	4701 60.02	INSULATE STEAM LINES	26.3	126.0	0.37	59.25	46
	4701 59.01	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
	4701 59.02	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
	4701 60.04	INSULATE STEAM LINES	19.0	92.0	2.22	8.62	204
	4701 60.01	INSULATE STEAM LINES	31.0	151.0	2.69	7.16	406
	4701 60.03	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175
	4901 56.00	HYDRAULIC SYSTEM HEAT RECOVERY	2894.0	13552.0	7.30	1.93	98995

TABLE ES-2

ECO SUMMARY OF RECOMMENDED PROJECTS
ORGANIZED BY BUILDING NUMBER THEN BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
5202	34.00	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72
5202	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5202	6.00	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91
5203	34.00	SEAL AIR HANDLING UNIT LEAKS	6.0	28.0	1.25	9.77	35
5205	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5205	6.00	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91
5206	34.00	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72
5206	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
6021	59.01	RETURN CONDENSATE	73.0	349.0	0.07	277.00	24
6021	59.03	RETURN CONDENSATE	120.0	528.0	0.50	38.42	265
6021	59.02	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
6021	60.00	INSULATE STEAM LINE	13.0	60.0	2.35	8.16	141
9224	5.00	CAULKING	28.8	125.0	0.51	34.48	64
9227	5.00	CAULKING	23.5	102.0	0.83	20.89	85
9227	40.00	HVAC OPERATIONS	93.7	402.0	0.07	13.63	30
9227	49.00	PIPE INSULATION	49.3	224.0	2.12	11.33	475
9227	22.10	LOWER KITCHEN HW TEMP	15.0	20.0	2.50	10.81	50
9227	13.00	REPLACE INCAN W/FLUORESCENT	27.6	299.0	1.00	9.04	298
9227	19.10	INSULATE WATER HEATER-KITCHEN	3.0	14.8	1.83	8.06	27
9227	19.20	INSULATE WATER HEATER-PIN ROOM	2.0	8.2	3.28	4.50	27
9227	23.00	HOT WATER BOOSTERS	11.0	88.0	3.78	3.78	333
9227	44.00	NIGHT SETBACK	29.0	77.0	5.94	2.68	457
9227	31.00	AIR CURTAINS	26.0	109.8	13.80	1.20	1515
20020	22.20	LOWER DOM HW TEMP-LKRR/RMS	90.0	293.5	0.17	51.52	50
20020	40.00	HVAC OPERATIONS	171.8	624.0	0.05	20.95	30
20020	49.00	PIPE INSULATION	17.2	117.7	1.00	19.50	118
20020	19.10	INSULATE WATER HEATER-KITCHEN	14.0	51.7	0.52	17.52	27
20020	22.10	LOWER DOM HW TEMP-KIT	36.0	86.4	0.58	15.83	50
20020	44.00	NIGHT SETBACK	114.0	519.0	0.88	11.71	457
20020	19.20	INSULATE WATER HEATER-LOCKERS	4.0	16.5	1.64	5.58	27
20020	6.00	WEATHER STRIPPING	1.6	10.0	1.70	2.63	17
30101	40.00	HVAC OPERATIONS	594.3	2234.0	0.01	75.10	30
30101	49.00	PIPE INSULATION	18.4	117.0	1.07	17.85	125
30101	23.00	HOT WATER BOOSTERS	39.0	428.0	0.78	11.06	333
30101	22.00	LOWER DOMESTIC HW TEMP	11.0	23.1	2.17	8.97	50
30101	19.00	WATER HEATER INSULATION	1.0	6.6	4.11	3.01	27
30101	52.00	KITCHEN HEAT RECOVERY	116.0	941.0	8.25	1.41	7760
30101	8.00	STORM WINDOWS	77.6	893.0	15.04	1.30	13433

TABLE ES-2

ECO SUMMARY OF RECOMMENDED PROJECTS ORGANIZED BY BUILDING NUMBER THEN BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
40110	40.00	HVAC OPERATIONS	63.1	210.0	0.14	7.02	30
40110	23.00	HOT WATER BOOSTERS	7.0	207.0	1.61	5.75	333
40110	19.00	WATER HEATER INSULATION	1.0	8.4	3.23	3.84	27
40110	8.00	STORM WINDOWS	55.3	376.0	8.04	2.07	3024
40110	36.00	BALANCE HVAC SYSTEM	100.2	583.0	3.23	1.29	1883
50101	22.00	LOWER DOMESTIC HW TEMP	27.0	134.5	0.37	34.36	50
50101	19.00	WATER HEATER INSULATION	4.0	25.0	1.08	11.48	27
50101	23.00	HOT WATER BOOSTERS	35.0	401.0	0.83	10.40	333
50101	8.00	STORM WINDOWS	79.7	542.0	8.44	1.97	4575
50101	52.00	KITCHEN HEAT RECOVERY	84.0	701.0	8.87	1.31	6221
HANGARS BASESIDE							
30101	12.01	EFFICIENT LIGHTING (HANGAR)	269.9	2194.0	7.30	1.57	16009
30103	12.02	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
30104	12.03	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
30106	12.04	EFFICIENT LIGHTING	301.6	2508.0	7.27	1.58	18246
30108	12.05	EFFICIENT LIGHTING	301.6	2508.0	7.27	1.58	18246
30301	12.06	EFFICIENT LIGHTING	641.3	2359.0	10.26	1.08	24211
30303	12.07	EFFICIENT LIGHTING	1375.8	5309.0	4.56	2.45	24211
40113	12.08	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
40117	12.09	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
40120	12.10	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
60104	12.11	EFFICIENT LIGHTING	398.4	1640.0	5.99	1.87	9825
60105	12.12	EFFICIENT LIGHTING	398.4	1640.0	5.99	1.87	9825
** B&V	BV-2.05	WH INSUL-120 GAL NG	11.1	50.0	0.58	25.19	29
** B&V	BV-2.03	WH INSUL-80 GAL NG	8.6	39.0	0.64	22.43	25
** B&V	BV-2.01	WH INSUL-40 GAL NG	6.2	28.0	0.79	18.72	22
** B&V	BV-2.06	WH INSUL-120 GAL EL	6.2	24.0	1.29	6.90	31
** B&V	BV-2.04	WH INSUL-80 GAL EL	4.7	18.0	1.44	6.09	26
** B&V	BV-2.02	WH INSUL-40 GAL EL	3.3	13.0	1.69	5.06	22
** B&V	BV-4.00	ROOF SPRAY COOLING	118.0	667.0	13.35	1.26	9039
*, ** B&V	BV-5.00	FLUSH VALVE RESTRICTORS	8,619,840 GAL.	4944.0	3.28	3.54	16226
** B&V	BV-6.00	FLUOR LIGHTING LOAD RED.	15161.3	50769.0	6.85	1.26	347582

NOTE:

* There are no energy savings associated with project BV-5.00. Savings are in gallons of water.

** This project is originally from the Black and Veatch Basewide Energy Plan. The costs were escalated to today's dollars and then a new life cycle cost analysis was performed in accordance with the scope of work.

*** Overlap of energy savings occurs between ECO 22 and 23 for building 106. For this reason, the ECO with the highest SIR is recommended.

15201 56433
372002

TABLE ES-3

ECO SUMMARY OF RECOMMENDED PROJECTS
 ORGANIZED BY PROJECT NUMBER THEN BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
**	B&V BV-2-01	WH INSUL-40 GAL NG	6.2	28.0	0.79	18.72	22
**	B&V BV-2-02	WH INSUL-40 GAL EL	3.3	13.0	1.69	5.06	22
**	B&V BV-2-03	WH INSUL-80 GAL NG	8.6	39.0	0.64	22.43	25
**	B&V BV-2-04	WH INSUL-80 GAL EL	4.7	18.0	1.44	6.09	26
**	B&V BV-2-05	WH INSUL-120 GAL NG	11.1	50.0	0.58	25.19	29
**	B&V BV-2-06	WH INSUL-120 GAL EL	6.2	24.0	1.29	6.90	31
**	106	VESTIBULE-EAST	14.2	60.0	3.83	4.28	230
**	B&V BV-4-00	ROOF SPRAY COOLING	118.0	677.0	13.35	1.26	9039
	9224	CAULKING	28.8	125.0	0.51	34.48	64
	9227	CAULKING	23.5	102.0	0.83	20.89	85
*	** B&V BV-5-00	FLUSH VALVE RESTRICTORS	8,619,840 GAL.	4,944.0	3.28	3.54	16226
	20020	WEATHER STRIPPING	1.6	10.0	1.70	2.63	17
	4511	WEATHER STRIPPING	14.2	60.0	2.48	1.83	149
	2908	WEATHER STRIPPING	5.2	22.0	4.14	1.09	91
	5202	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91
	5205	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91
**	B&V BV-6-00	FLUOR LIGHTING LOAD RED.	15161.3	50769.0	6.85	1.26	347582
	40110	STORM WINDOWS	55.3	376.0	8.04	2.07	3024
	50101	STORM WINDOWS	79.7	542.0	8.44	1.97	4575
	30101	STORM WINDOWS	77.6	893.0	15.04	1.30	13433
	30101	EFFICIENT LIGHTING (HANGAR)	269.9	2194.0	7.30	1.57	16009
	30103	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	30104	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	30106	EFFICIENT LIGHTING	301.6	2508.0	7.27	1.58	18246
	30108	EFFICIENT LIGHTING	301.6	2508.0	7.27	1.58	18246
	30301	EFFICIENT LIGHTING	641.3	2359.0	10.26	1.08	24211
	30303	EFFICIENT LIGHTING	1375.8	5309.0	4.56	2.45	24211
	40113	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	40117	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	40120	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	60104	EFFICIENT LIGHTING	398.4	1640.0	5.99	1.87	9825
	60105	EFFICIENT LIGHTING	398.4	1640.0	5.99	1.87	9825
	9227	REPLACE INCAN W/FLOURESCENT	27.6	299.0	1.00	9.04	298
	106	WATER HEATER INSULATION	10.0	38.2	0.71	12.93	27
	50101	WATER HEATER INSULATION	4.0	25.0	1.08	11.48	27
	40110	WATER HEATER INSULATION	1.0	8.4	3.23	3.84	27
	30101	WATER HEATER INSULATION	1.0	6.6	4.11	3.01	27
	20020	INSULATE WATER HEATER-KITCHEN	14.0	51.7	0.52	17.52	27
	9227	INSULATE WATER HEATER-KITCHEN	3.0	14.8	1.83	8.06	27
	20020	INSULATE WATER HEATER-LOCKERS	4.0	16.5	1.64	5.58	27
	9227	INSULATE WATER HEATER-PIN ROOM	2.0	8.2	3.28	4.50	27
	50101	LOWER DOMESTIC HW TEMP	27.0	134.5	0.37	34.36	50
	2908	LOWER DOM HW TEMP-KITCHEN	16.0	20.8	2.40	11.03	50
	30101	LOWER DOMESTIC HW TEMP	11.0	23.1	2.17	8.97	50
***	106	LOWER DOM HW TEMP	24.0	41.1	1.22	8.02	50

TABLE ES-3

ECO SUMMARY OF RECOMMENDED PROJECTS
 ORGANIZED BY PROJECT NUMBER THEN BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
20020	22-10	LOWER DOM HW TEMP-KIT	36.0	86.4	0.58	15.83	50
9227	22-10	LOWER KITCHEN HW TEMP	15.0	20.0	2.50	10.81	50
113	22-10	LOWER DOM HW TEMP-RESTRMS	12.0	2.4	20.49	6.18	50
20020	22-20	LOWER DOM HW TEMP-LKR/RRMS	90.0	293.5	0.17	51.52	50
30101	23-00	HOT WATER BOOSTERS	39.0	428.0	0.78	11.06	333
50101	23-00	HOT WATER BOOSTERS	35.0	401.0	0.83	10.40	333
40110	23-00	HOT WATER BOOSTERS	7.0	207.0	1.61	5.75	333
***	106	HW BOOSTERS	69.0	263.0	1.27	5.29	333
9227	23-00	HOT WATER BOOSTERS	11.0	88.0	3.78	3.78	333
113	27-00	CHANGE TO VAV SYSTEM	2010.7	7661.0	2.56	3.32	19639
2908	27-00	CHANGE TO VAV SYSTEM	1141.3	4348.0	2.82	3.01	12274
113	31-00	AIR CURTAINS	43.0	186.4	8.13	1.98	1515
2908	31-00	AIR CURTAINS	78.0	337.0	8.80	1.66	2967
9227	31-00	AIR CURTAINS	26.0	109.8	13.80	1.20	1515
5202	34-00	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72
5206	34-00	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72
5203	34-00	SEAL AIR HANDLING UNIT LEAKS	6.0	28.0	1.25	9.77	35
113	35-00	ECONOMIZER CYCLE	1595.1	6061.0	0.32	26.36	1955
2908	35-00	ECONOMIZER CYCLE	765.3	2916.0	2.18	3.91	6346
40110	36-00	BALANCE HVAC SYSTEM	100.2	583.0	3.23	1.29	1883
30101	40-00	HVAC OPERATIONS	594.3	2234.0	0.01	75.10	30
113	40-00	HVAC OPERATIONS	341.4	1271.0	0.02	42.71	30
2908	40-00	HVAC OPERATIONS	191.8	701.0	0.04	23.53	30
20020	40-00	HVAC OPERATIONS	171.8	624.0	0.05	20.95	30
9227	40-00	HVAC OPERATIONS	93.7	402.0	0.07	13.63	30
40110	40-00	HVAC OPERATIONS	63.1	210.0	0.14	7.02	30
106	40-00	HVAC OPERATIONS	31.8	95.0	0.32	3.12	30
2908	41-13	PKG 13-EMCS	0.0	6876.0	0.00	5.03	12421
113	41-13	PKG 13-EMCS	0.0	6214.0	0.00	4.54	12421
106	44-00	NIGHT SETBACK	190.0	767.0	0.60	19.32	457
20020	44-00	NIGHT SETBACK	114.0	519.0	0.88	11.71	457
113	44-00	NIGHT SETBACK	296.0	1051.0	3.47	3.41	3652
9227	44-00	NIGHT SETBACK	29.0	77.0	5.94	2.68	457
20020	49-00	PIPE INSULATION	17.2	117.7	1.00	19.50	118
30101	49-00	PIPE INSULATION	18.4	117.0	1.07	17.85	125
9227	49-00	PIPE INSULATION	49.3	224.0	2.12	11.33	475
106	49-00	PIPE INSULATION	32.4	123.4	2.67	4.50	330
5202	50-00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5205	50-00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5206	50-00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
30101	52-00	KITCHEN HEAT RECOVERY	116.0	941.0	8.25	1.41	7760
50101	52-00	KITCHEN HEAT RECOVERY	84.0	701.0	8.87	1.31	6221
113	52-00	KITCHEN HEAT RECOVERY	81.0	462.0	10.97	1.27	5067
4901	56-00	HYDRAULIC SYSTEM HEAT RECOVERY	2894.0	13552.0	7.30	1.93	98995

TABLE ES-3

ECO SUMMARY OF RECOMMENDED PROJECTS
ORGANIZED BY PROJECT NUMBER THEN BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
6021	59-01	RETURN CONDENSATE	73.0	349.0	0.07	277.00	24
4701	59-01	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
4701	59-02	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
6021	59-02	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
6021	59-03	RETURN CONDENSATE	120.0	528.0	0.50	38.42	265
6021	60-00	INSULATE STEAM LINE	13.0	60.0	2.35	8.16	141
311	60-01	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228
4701	60-01	INSULATE STEAM LINES	31.0	151.0	2.69	7.16	406
4701	60-02	INSULATE STEAM LINES	26.3	126.0	0.37	59.25	46
311	60-02	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175
311	60-03	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228
4701	60-03	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175
4701	60-04	INSULATE STEAM LINES	19.0	92.0	2.22	8.62	204
311	60-04	INSULATE STEAM LINES	24.0	116.0	3.32	5.72	385
311	60-05	INSULATE STEAM LINE	30.0	143.0	2.94	6.55	420
311	60-06	INSULATE STEAM LINES	15.0	73.0	2.88	6.67	210

NOTE:

* There are no energy savings associated with project BV-5.00. Savings are in gallons of water.

** This project is originally from the Black and Veatch Basewide Energy Plan. The costs were escalated to today's dollars and then a new life cycle cost analysis was performed in accordance with the scope of work.

*** Overlap of energy savings occurs between ECO 22 and 23 for building 106. For this reason, the ECO with the highest SIR is recommended.

TABLE ES-4

EGO SUMMARY OF RECOMMENDED PROJECTS
ORGANIZED BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
	6021	RETURN CONDENSATE	73.0	349.0	0.07	277.00	24
	30101	HVAC OPERATIONS	594.3	2234.0	0.01	75.10	30
	4701	INSULATE STEAM LINES	26.3	126.0	0.37	59.25	46
	20020	LOWER DOM HW TEMP-LKR/RRMS	90.0	293.5	0.17	51.52	50
	113	HVAC OPERATIONS	341.4	1271.0	0.02	42.71	30
	6021	RETURN CONDENSATE	120.0	528.0	0.50	38.42	265
	9224	CAULKING	28.8	125.0	0.51	34.48	64
	50101	LOWER DOMESTIC HW TEMP	27.0	134.5	0.37	34.36	50
	4701	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
	4701	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
	6021	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22
	5202	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72
	5206	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72
	113	ECONOMIZER CYCLE	1595.1	6061.0	0.32	26.36	1955
**	B&V	WH INSUL-120 GAL NG	11.1	50.0	0.58	25.19	29
	2908	HVAC OPERATIONS	191.8	701.0	0.04	23.53	30
**	B&V	WH INSUL-80 GAL NG	8.6	39.0	0.64	22.43	25
	20020	HVAC OPERATIONS	171.8	624.0	0.05	20.95	30
	9227	CAULKING	23.5	102.0	0.83	20.89	85
	20020	PIPE INSULATION	17.2	117.7	1.00	19.50	118
	106	NIGHT SETBACK	190.0	767.0	0.60	19.32	457
**	B&V	WH INSUL-40 GAL NG	6.2	28.0	0.79	18.72	22
	30101	PIPE INSULATION	18.4	117.0	1.07	17.85	125
	20020	INSULATE WATER HEATER-KITCHEN	14.0	51.7	0.52	17.52	27
	20020	LOWER DOM HW TEMP-KIT	36.0	86.4	0.58	15.83	50
	9227	HVAC OPERATIONS	93.7	402.0	0.07	13.63	30
	106	WATER HEATER INSULATION	10.0	38.2	0.71	12.93	27
	20020	NIGHT SETBACK	114.0	519.0	0.88	11.71	457
	50101	WATER HEATER INSULATION	4.0	25.0	1.08	11.48	27
	9227	PIPE INSULATION	49.3	224.0	2.12	11.33	475
	30101	HOT WATER BOOSTERS	39.0	428.0	0.78	11.06	333
	2908	LOWER DOM HW TEMP-KITCHEN	16.0	20.8	2.40	11.03	50
	9227	LOWER KITCHEN HW TEMP	15.0	20.0	2.50	10.81	50
	50101	HOT WATER BOOSTERS	35.0	401.0	0.83	10.40	333
	5203	SEAL AIR HANDLING UNIT LEAKS	6.0	28.0	1.25	9.77	35
	9227	REPLACE INCAN W/FLUORESCENT	27.6	299.0	1.00	9.04	298
	30101	LOWER DOMESTIC HW TEMP	11.0	23.1	2.17	8.97	50
	4701	INSULATE STEAM LINES	19.0	92.0	2.22	8.62	204
	311	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228
	311	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228
	6021	INSULATE STEAM LINE	13.0	60.0	2.35	8.16	141
	9227	INSULATE WATER HEATER-KITCHEN	3.0	14.8	1.83	8.06	27
***	106	LOWER DOM HW TEMP	24.0	41.1	1.22	8.02	50
	4701	INSULATE STEAM LINES	31.0	151.0	2.69	7.16	406
	40110	HVAC OPERATIONS	63.1	210.0	0.14	7.02	30

TABLE ES-4

ECO SUMMARY OF RECOMMENDED PROJECTS
ORGANIZED BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
** B&V	BV-2.06	WH INSUL-120 GAL EL	6.2	24.0	1.29	6.90	31
	311	INSULATE STEAM LINES	15.0	73.0	2.88	6.67	210
	311	INSULATE STEAM LINE	30.0	143.0	2.94	6.55	420
	113	LOWER DOM HW TEMP-RESTRMS	12.0	2.4	20.49	6.18	50
** B&V	BV-2.04	WH INSUL-80 GAL EL	4.7	18.0	1.44	6.09	26
	40110	HOT WATER BOOSTERS	7.0	207.0	1.61	5.75	333
	311	INSULATE STEAM LINES	24.0	116.0	3.32	5.72	385
	20020	INSULATE WATER HEATER-LOCKERS	4.0	16.5	1.64	5.58	27
***	106	HW BOOSTERS	69.0	263.0	1.27	5.29	333
** B&V	BV-2.02	WH INSUL-40 GAL EL	3.3	13.0	1.69	5.06	22
	2908	PKG 13-EMCS	0.0	6876.0	0.00	5.03	12421
	113	PKG 13-EMCS	0.0	6214.0	0.00	4.54	12421
	106	PIPE INSULATION	32.4	123.4	2.67	4.50	330
	9227	INSULATE WATER HEATER-PIN ROOM	2.0	8.2	3.28	4.50	27
	106	VESTIBULE-EAST	14.2	60.0	3.83	4.28	230
	2908	ECONOMIZER CYCLE	765.3	2916.0	2.18	3.91	6346
	40110	WATER HEATER INSULATION	1.0	8.4	3.23	3.84	27
	9227	HOT WATER BOOSTERS	11.0	88.0	3.78	3.78	333
*, ** B&V	BV-5.00	FLUSH VALVE RESTRICTORS	8,619,840 GAL.	4944.0	3.28	3.54	16226
	113	NIGHT SETBACK	296.0	1051.0	3.47	3.41	3652
	113	CHANGE TO VAV SYSTEM	2010.7	7661.0	2.56	3.32	19639
	106	HVAC OPERATIONS	31.8	95.0	0.32	3.12	30
	2908	CHANGE TO VAV SYSTEM	1141.3	4348.0	2.82	3.01	12274
	30101	WATER HEATER INSULATION	1.0	6.6	4.11	3.01	27
	9227	NIGHT SETBACK	29.0	77.0	5.94	2.68	457
	20020	WEATHER STRIPPING	1.6	10.0	1.70	2.63	17
	30303	EFFICIENT LIGHTING	1375.8	5309.0	4.56	2.45	24211
	40110	STORM WINDOWS	55.3	376.0	8.04	2.07	3024
	113	AIR CURTAINS	43.0	186.4	8.13	1.98	1515
	50101	STORM WINDOWS	79.7	542.0	8.44	1.97	4575
	4901	HYDRAULIC SYSTEM HEAT RECOVERY	2894.0	13552.0	7.30	1.93	98995
	60104	EFFICIENT LIGHTING	398.4	1640.0	5.99	1.87	9825
	60105	EFFICIENT LIGHTING	398.4	1640.0	5.99	1.87	9825
	4511	WEATHER STRIPPING	14.2	60.0	2.48	1.83	149
	2908	AIR CURTAINS	78.0	337.0	8.80	1.66	2967
	30106	EFFICIENT LIGHTING	301.6	2508.0	7.27	1.58	18246
	30108	EFFICIENT LIGHTING	301.6	2508.0	7.27	1.58	18246
	30101	EFFICIENT LIGHTING (HANGAR)	269.9	2194.0	7.30	1.57	16009
	30103	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	30104	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	40113	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	40117	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	40120	EFFICIENT LIGHTING	269.9	2194.0	7.30	1.57	16009
	30101	KITCHEN HEAT RECOVERY	116.0	941.0	8.25	1.41	7760
	311	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175

TABLE ES-4

ECO SUMMARY OF RECOMMENDED PROJECTS
ORGANIZED BY DESCENDING SAVINGS TO INVESTMENT RATIO

BUILDING NUMBER	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS
4701	60.03	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175
50101	52.00	KITCHEN HEAT RECOVERY	84.0	701.0	8.87	1.31	6221
30101	8.00	STORM WINDOWS	77.6	893.0	15.04	1.30	13433
40110	36.00	BALANCE HVAC SYSTEM	100.2	583.0	3.23	1.29	1883
113	52.00	KITCHEN HEAT RECOVERY	81.0	462.0	10.97	1.27	5067
** B&V	BV-6.00	FLUOR LIGHTING LOAD RED.	15161.3	50769.0	6.85	1.26	347582
** B&V	BV-4.00	ROOF SPRAY COOLING	118.0	677.0	13.35	1.26	9039
9227	31.00	AIR CURTAINS	26.0	109.8	13.80	1.20	1515
2908	6.00	WEATHER STRIPPING	5.2	22.0	4.14	1.09	91
30301	12.06	EFFICIENT LIGHTING	641.3	2359.0	10.26	1.08	24211
5202	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5205	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5206	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23
5202	6.00	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91
5205	6.00	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91

NOTE:

- * There are no energy savings associated with project BV-5.00. Savings are in gallons of water.
- ** This project is originally from the Black and Veatch Basewide Energy Plan. The costs were escalated to today's dollars and then a new life cycle cost analysis was performed in accordance with the scope of work.
- *** Overlap of energy savings occurs between ECO 22 and 23 for building 106. For this reason, the ECO with the highest SIR is recommended.

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR PAYBACK SAVINGS PER YEAR	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 106							
ARCHITECTURAL *							
NA	1.00	REDUCE GLASS AREA	0.0	0.0	0.00	0	MINIMUM GLASS RECOMMENDED
106-1	2.10	VESTIBULE-EAST	14.2	60.0	4.28	230	NOT PRACTICABLE
NA	2.20	VESTIBULE-SOUTH	0.0	0.0	0.00	0	MINIMUM GLASS
NA	3.00	SOLAR FILMS	0.0	0.0	0.00	0	MINIMUM GLASS
NA	4.00	INSULATED PANELS	0.0	0.0	0.00	0	NONE NECESSARY
NA	5.00	CAULKING	0.0	0.0	0.00	0	NOT RECOMMENDED
106-9	6.00	WEATHER STRIPPING	4.9	21.0	0.00	182	MINIMUM GLASS
NA	7.00	DOUBLE GLAZING	0.0	0.0	0.00	0	NOT CONSIDERED
NA	8.00	STORM WINDOWS	0.0	0.0	0.00	0	NOT RECOMMENDED
106-14	9.00	INSULATION	15.1	61.0	0.00	1637	ALREADY IN USE
ELECTRICAL							
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0	NOT REQUIRED-LOW LIGHT LEVELS
NA	13.00	REPL INCAND. W/FLUORESCENT	0.0	0.0	0.00	0	NOT REQUIRED-LOW LIGHT LEVELS
NA	14.00	REDUCE LIGHTING LEVELS	0.0	0.0	0.00	0	NOT REQUIRED-LOW LIGHT LEVELS
MECHANICAL *							
106-17	19.00	WATER HEATER INSULATION	10.0	38.2	0.71	27	RECOMMENDED
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0	SEE PROJECT 21
106-21	21.00	WATER HEATER SHUTOFF	0.3	1.1	0.00	82	NOT RECOMMENDED
106-26	22.00	LOWER DOM HW TEMP	24.0	41.1	1.22	50	RECOMMENDED
106-30	23.00	HW BOOSTERS	69.0	263.0	1.27	333	RECOMMENDED
NA	27.00	CHANGE TO VAV SYSTEM	0.0	0.0	0.00	0	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0	HOODS OFF WHEN NOT REQUIRED
106-38	29.00	KITCHEN MAKEUP AIR	24.3	58.0	0.00	5887	NOT RECOMMENDED
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0	NOT APPROPRIATE
106-45	31.00	AIR CURTAINS	2.0	0.1	0.00	1515	NOT RECOMMENDED
106-49	35.00	ECONOMIZER CYCLE	20.5	78.0	0.00	1495	NOT RECOMMENDED
106-52	36.00	BALANCE HVAC	17.8	71.0	0.00	986	NOT RECOMMENDED
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0	NO UPGRADE RECOMMENDED
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0	NOT RECOMMENDED
106-55	40.00	HVAC OPERATIONS	31.8	95.0	0.32	30	RECOMMENDED
106-58	44.00	NIGHT SETBACK	190.0	767.0	0.60	457	RECOMMENDED
106-61	46.00	INFRARED HEATERS	80.3	330.0	0.00	5140	NOT RECOMMENDED
106-65	49.00	PIPE INSULATION	32.4	123.4	2.67	330	RECOMMENDED
106-68	52.00	KITCHEN HEAT RECOVERY	12.0	71.0	0.00	5452	NOT RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	1.0	0.0	0.00	1670	NO DISHWASHER IN BUILDING
106-73	55.10	KITCH EXH HEAT RECOV AIR/AIR	61.2	279.0	0.00	7345	NOT RECOMMENDED
106-77	55.20	KITCH EXH HEAT RECOV-RUNAROUND	61.2	279.0	0.00	19223	NOT RECOMMENDED
BUILDING 113							
ARCHITECTURAL *							
113-1	1.00	REDUCE GLASS AREA	34.2	1309.0	0.00	17244	NOT RECOMMENDED
GEN-1	2.00	VESTIBULES	34.2	144.0	0.00	3764	NOT RECOMMENDED
113-4	3.00	SOLAR FILMS	0.0	0.0	0.00	0	WINDOWS ARE TINTED
113-7	4.00	INSULATED PANELS	222.1	770.0	0.00	18471	NOT RECOMMENDED
NA	5.00	CAULKING	0.0	0.0	0.00	0	NONE REQUIRED

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE

** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 113 (CONTINUED)								
NA	6.00	WEATHER STRIPPING	0.0	0.0	0.00	0.00	0	NOT REQUIRED
113-10	7.00	DOUBLE GLAZING	84.6	398.0	0.00	0.24	35577	NOT RECOMMENDED
113-13	8.00	STORM WINDOWS	408.0	1639.0	0.00	0.81	28104	NOT RECOMMENDED
NA	9.00	INSULATION	0.0	0.0	0.00	0.00	0	INSULATION IS SUFFICIENT
ELECTRICAL								
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0.00	0	NO CHANGES REQUIRED
NA	13.00	REPLACE INCAN W/FLUORESCENT	0.0	0.0	0.00	0.00	0	FLUORESCENTS IN USE
NA	14.00	REDUCE LIGHTING LEVELS	0.0	0.0	0.00	0.00	0	LIGHT LEVELS OK
MECHANICAL *								
NA	19.00	WATER HEATER INSULATION	0.0	0.0	0.00	0.00	0	NOT NECESSARY
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0.00	0	SEE PROJECT 21
113-16	21.10	WATER HEATER SHUTOFF-RESTROOMS	0.0	0.3	0.00	0.02	219	NOT RECOMMENDED
113-21	21.20	WATER HEATER SHUTOFF-KITCHEN	0.1	0.4	0.00	0.02	219	NOT RECOMMENDED
113-26	22.10	LOWER DOM HW TEMP-RESTRMS	12.0	2.4	20.49	6.18	50	RECOMMENDED
NA	22.20	LOWER DOM HW TEMP-KITCHEN	0.0	0.0	0.00	0.00	0	NOT REQUIRED-140 F
NA	23.00	HOT WATER BOOSTERS	0.0	0.0	0.00	0.00	0	ALREADY IN USE
113-31	27.00	CHANGE TO VAV SYSTEM	2010.7	7661.0	2.56	3.32	19639	RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0.00	0	HOODS ARE OFF WHEN NOT IN USE
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0.00	0	ALREADY IN USE
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0.00	0	AIR BALANCE W/KITCHEN IS OK
113-35	31.00	AIR CURTAINS	43.0	186.4	8.13	1.98	1515	RECOMMENDED
113-39	35.00	ECONOMIZER CYCLE	1595.1	6061.0	0.32	26.36	1955	RECOMMENDED
NA	36.00	BALANCE HVAC	0.0	0.0	0.00	0.00	0	BALANCE IS SATISFACTORY
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	NOT REQUIRED
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0.00	0	NO CHANGES RECOMMENDED
113-43	40.00	HVAC OPERATIONS	341.4	1271.0	0.02	42.71	30	RECOMMENDED
113-46	44.00	NIGHT SETBACK	296.0	1051.0	3.47	3.41	3652	RECOMMENDED
NA	46.00	INFRARED HEATERS	0.0	0.0	0.00	0.00	0	CEILING TO LOW
NA	49.00	PIPE INSULATION	0.0	0.0	0.00	0.00	0	ALL PIPE INSULATED
113-53	52.00	KITCHEN HEAT RECOVERY	81.0	462.0	10.97	1.27	5067	RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0.00	0	SEE PROJECT 52
113-59	55.10	KITCH EXH HEAT RECOV AIR/AIR	538.7	2325.0	0.00	0.53	58999	NOT RECOMMENDED
113-63	55.20	KITCH EXH HEAT RECOV-RUNAROUND	538.7	2558.0	0.00	0.80	41473	NOT RECOMMENDED
BUILDING 311								
MECHANICAL *								
NA	57.00	REVISE BOILER CONTROLS	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
NA	58.00	BOILER OXYGEN TRIM CONTROL	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
NA	59.00	RETURN CONDENSATE	0.0	0.0	0.00	0.00	0	NO CONDENSATE LEAKS
311-1	60.01	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228	RECOMMENDED
311-7	60.02	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175	RECOMMENDED
311-13	60.03	INSULATE STEAM LINES	21.0	103.0	2.21	8.61	228	RECOMMENDED
311-19	60.04	INSULATE STEAM LINES	24.0	116.0	3.32	5.72	385	RECOMMENDED
311-25	60.05	INSULATE STEAM LINE	30.0	143.0	2.94	6.55	420	RECOMMENDED
311-31	60.06	INSULATE STEAM LINES	15.0	73.0	2.88	6.67	210	RECOMMENDED

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE
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TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 1102								
MECHANICAL								
NA	57.00	REVISE BOILER CONTROLS	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
NA	58.00	BOILER OXYGEN TRIM CONTROL	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
NA	59.00	RETURN CONDENSATE	0.0	0.0	0.00	0.00	0	NO CONDENSATE LEAKS
NA	60.00	INSULATE STEAM LINES	0.0	0.0	0.00	0.00	0	PROPERLY INSULATED
BUILDING 2908								
ARCHITECTURAL *								
2908-1	1.00	REDUCE GLASS AREA	-75.0	-264.0	0.00	-1.18	9304	NOT RECOMMENDED
GEN-1	2.00	VESTIBULES	34.2	144.0	0.00	0.63	3764	NOT RECOMMENDED
2908-4	3.00	SOLAR FILMS	0.0	0.0	0.00	0.00	0	EXISTING GLASS IS TINTED
2908-7	4.00	INSULATED PANELS	-80.9	-287.0	0.00	-2.20	9966	NOT RECOMMENDED
NA	5.00	CAULKING	0.0	0.0	0.00	0.00	0	NOT REQUIRED AT THIS TIME
2908-10	6.00	WEATHER STRIPPING	5.2	22.0	4.14	1.09	91	RECOMMENDED
NA	7.00	DOUBLE GLAZING	0.0	0.0	0.00	0.00	0	ALREADY IN USE
2908-15	8.00	STORM WINDOWS	-191.1	-707.0	0.00	-4.44	15163	NOT RECOMMENDED
NA	9.00	INSULATION	0.0	0.0	0.00	0.00	0	INSULATION IS SUFFICIENT
ELECTRICAL								
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0.00	0	NO CHANGES RECOMMENDED
NA	13.00	REPLACE INCAN W/FLUORESCENT	0.0	0.0	0.00	0.00	0	ONLY USED FOR MOOD LIGHTING
NA	14.00	REDUCE LIGHT LEVELS	0.0	0.0	0.00	0.00	0	LIGHT LEVELS OK
MECHANICAL *								
NA	19.00	WATER HEATER INSULATION	0.0	0.0	0.00	0.00	0	HEATER HAS 1-1/2 IN. BLANKET
NA	20.00	WATER HEATER TEMP CONT	0.0	0.0	0.00	0.00	0	SEE PROJECT 21
2908-18	21.00	WATER HEATER SHUTOFF	0.0	0.2	0.00	0.01	219	NOT RECOMMENDED
2908-23	22.00	LOWER DOM HW TEMP-KITCHEN	16.0	20.8	2.40	11.03	50	RECOMMENDED
NA	23.00	HOT WATER BOOSTERS	0.0	0.0	0.00	0.00	0	ALREADY IN USE
2908-27	27.00	CHANGE TO VAV SYSTEM	1141.3	4348.0	2.82	3.01	12274	RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0.00	0	HOODS ARE OFF WHEN NOT IN USE
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0.00	0	MAKEUP AIR IS SUFFICIENT
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0.00	0	AIR BALANCE W/KITCHEN IS OK
2908-30	31.00	AIR CURTAINS	78.0	337.0	8.80	1.66	2967	RECOMMENDED
2908-34	35.00	ECONOMIZER CYCLE	765.3	2916.0	2.18	3.91	6346	RECOMMENDED
NA	36.00	BALANCE HVAC	0.0	0.0	0.00	0.00	0	BALANCE IS SATISFACTORY
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	CONTROLS RECENTLY UPGRADED
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0.00	0	NO CHANGES REQUIRED
2908-38	40.00	HVAC OPERATIONS	191.8	701.0	0.04	23.53	30	RECOMMENDED
NA	44.00	NIGHT SETBACK CONTROL	0.0	0.0	0.00	0.00	0	NOT REQUIRED
2908-41	46.00	INFRARED HEATERS	685.8	2737.0	0.00	0.89	29931	NOT REQUIRED
NA	49.00	PIPE INSULATION	0.0	0.0	0.00	0.00	0	NOT REQUIRED
2908-45	52.00	KITCHEN HEAT RECOVERY	63.0	327.0	0.00	0.90	5067	NOT RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0.00	0	SEE PROJECT 52
2908-50	55.10	KITCH EXH HEAT RECOV AIR/AIR	538.7	2325.0	0.00	0.53	58999	NOT RECOMMENDED
2908-54	55.20	KITCH EXH HEAT RECOV-RUNAROUND	538.7	2558.0	0.00	0.80	41473	NOT RECOMMENDED

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TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS,	REMARKS
BUILDING 4510								
ELECTRICAL NA	16.00	TRANSFORMER OVERVOLTAGE	0.0	0.0	0.00	0.00	0	NO OVERVOLTAGE EXISTS
MECHANICAL NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	NEW HVAC TO BE INSTALLED
BUILDING 4511								
ARCHITECTURAL * 4511-1	6.00	WEATHER STRIPPING	14.2	60.0	2.48	1.83	149	RECOMMENDED
ELECTRICAL NA	16.00	TRANSFORMER OVERVOLTAGE	0.0	0.0	0.00	0.00	0	NO OVERVOLTAGE EXISTS
MECHANICAL NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	RECENTLY REPLACED
BUILDING 4605								
MECHANICAL * 4605-1	47.00	SOLAR HEATING	4048.0	18416.0	0.00	0.43	618980	POOL-NOT RECOMMENDED
BUILDING 4701								
MECHANICAL * NA	57.00	REVISE BOILER CONTROLS	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
NA	58.00	BOILER OXYGEN TRIM CONTROL	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
4701-1	59.01	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22	RECOMMENDED
4701-5	59.02	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22	RECOMMENDED
4701-9	60.01	INSULATE STEAM LINES	31.0	151.0	2.69	7.16	406	RECOMMENDED
4701-15	60.02	INSULATE STEAM LINES	26.3	126.0	0.37	59.25	466	RECOMMENDED
4701-19	60.03	INSULATE STEAM LINES	3.0	12.0	14.58	1.34	175	RECOMMENDED
4701-25	60.04	INSULATE STEAM LINES	19.0	92.0	2.22	8.62	204	RECOMMENDED
BUILDING 4901								
MECHANICAL * 4901-1	56.00	HYDRAULIC SYSTEM HEAT RECOVERY	2894.0	13552.0	7.30	1.93	98995	RECOMMENDED
BUILDING 5102								
ARCHITECTURAL NA	9.00	INSULATION	0.0	0.0	0.00	0.00	0	INSULATION MEETS DOD
MECHANICAL NA	35.00	ECONOMIZER CYCLE	0.0	0.0	0.00	0.00	0	ALREADY IN USE
BUILDING 5202								
ARCHITECTURAL * 5202-1	6.00	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91	RECOMMENDED
MECHANICAL * 5202-6	34.00	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72	RECOMMENDED
5202-10	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23	RECOMMENDED

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TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 5203								
MECHANICAL *	34.00	SEAL AIR HANDLING UNIT LEAKS	6.0	28.0	1.25	9.77	35	RECOMMENDED
BUILDING 5205								
ARCHITECTURAL *	6.00	WEATHER STRIPPING	4.9	21.0	4.33	1.04	91	RECOMMENDED
MECHANICAL *	34.00	SEAL AIR HANDLING UNIT LEAKS	0.0	0.0	0.00	0.00	0	NOT NECESSARY
NA	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23	RECOMMENDED
BUILDING 5206								
MECHANICAL *	34.00	SEAL AIR HANDLING UNIT LEAKS	41.0	175.0	0.41	29.53	72	RECOMMENDED
MECHANICAL *	50.00	FIX LEAKING CW PUMP	1.6	6.2	3.69	1.08	23	RECOMMENDED
BUILDING 6021								
MECHANICAL *	57.00	REVISE BOILER CONTROLS	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
NA	58.00	BOILER OXYGEN TRIM CONTROLS	0.0	0.0	0.00	0.00	0	REMOVED FROM STUDY
6021-1	59.01	RETURN CONDENSATE	73.0	349.0	0.07	277.00	24	RECOMMENDED
6021-5	59.02	RETURN CONDENSATE	7.0	35.0	0.63	29.83	22	RECOMMENDED
6021-9	59.03	RETURN CONDENSATE	120.0	528.0	0.50	38.42	265	RECOMMENDED
6021-13	60.00	INSULATE STEAM LINE	13.0	60.0	2.35	8.16	141	RECOMMENDED
BUILDING 8795								
MECHANICAL	57.00	REVISE BOILER CONTROLS	0.0	0.0	0.00	0.00	0	ABANDONED
NA	58.00	BOILER OXYGEN TRIM CONTROLS	0.0	0.0	0.00	0.00	0	ABANDONED
NA	59.00	RETURN CONDENSATE	0.0	0.0	0.00	0.00	0	ABANDONED
BUILDING 9224								
ARCHITECTURAL *	1.00	REDUCE GLASS AREA	2.8	12.0	0.00	0.12	1413	NOT RECOMMENDED
GEN-1	2.00	VESTIBULES	34.2	144.0	0.00	0.63	3764	NOT RECOMMENDED
9224-4	3.00	SOLAR FILMS	2.8	11.0	0.00	0.15	311	NOT RECOMMENDED
9224-7	4.00	INSULATED PANELS	3.4	14.0	0.00	0.12	1630	NOT RECOMMENDED
9224-10	5.00	CAULKING	28.8	125.0	0.51	34.48	64	RECOMMENDED
NA	6.00	WEATHER STRIPPING	0.0	0.0	0.00	0.00	0	WEATHER STRIPPING IS OK
9224-15	7.00	DOUBLE GLAZING	4.0	18.0	0.00	0.11	3140	NOT RECOMMENDED
9224-18	8.00	STORM WINDOWS	5.9	26.0	0.00	0.21	2469	NOT RECOMMENDED
9224-21	9.00	INSULATION	3.3	14.0	0.00	0.18	1168	NOT RECOMMENDED
ELECTRICAL	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0.00	0	REFER TO PROJECT 13
NA	13.00	REPLACE INCAN W/FLUORESCENT	0.0	0.0	0.00	0.00	0	ALREADY IN USE
NA	14.00	REDUCE LIGHTING LEVELS	0.0	0.0	0.00	0.00	0	NOT REQUIRED-LOW LIGHT LEVELS

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TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 9224 (CONTINUED)							
MECHANICAL							
NA	19.00	WATER HEATER INSULATION	0.0	0.0	0.00	0	NOT REQUIRED-NO HW IN BUILDING
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0	NOT REQUIRED-NO HW IN BUILDING
NA	21.00	WATER HEATER SHUTOFF	0.0	0.0	0.00	0	NOT REQUIRED-NO HW IN BUILDING
NA	22.00	LOWER DOM HW TEMPERATURE	0.0	0.0	0.00	0	NOT REQUIRED-NO HW IN BUILDING
NA	23.00	HOT WATER BOOSTERS	0.0	0.0	0.00	0	HI TEMPERATURE NOT REQUIRED
9224-24	27.00	CHANGE TO VAV SYSTEM	3.1	12.0	0.00	2455	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0	NOT REQUIRED
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0	NOT REQUIRED
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0	NOT REQUIRED
NA	31.00	AIR CURTAINS	0.0	0.0	0.00	0	NOT RECOMMENDED
9224-27	35.00	ECONOMIZER CYCLE	1.9	7.0	0.00	2905	NOT RECOMMENDED
NA	36.00	BALANCE HVAC SYSTEMS	0.0	0.0	0.00	0	NOT REQUIRED
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0	NOT REQUIRED
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0	NOT REQUIRED
NA	40.00	HVAC OPERATIONS	0.0	0.0	0.00	0	OFF WHEN NOT IN USE
NA	44.00	NIGHT SETBACK CONTROL	0.0	0.0	0.00	0	NOT RECOMMENDED
9224-31	46.00	INFRARED HEATERS	8.5	38.0	0.00	2794	NOT RECOMMENDED
NA	49.00	PIPE INSULATION	0.0	0.0	0.00	0	ALL PIPE INSULATED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0	NO DISHWASHING REQUIRED
NA	55.00	KITCHEN EXH HEAT RECOVERY	0.0	0.0	0.00	0	NO KITCHEN FUNCTIONS
BUILDING 9227							
ARCHITECTURAL *							
NA	1.00	REDUCE GLASS AREA	0.0	0.0	0.00	0	BLDG HAS ALMOST NO GLASS
GEN-1	2.00	VESTIBULES	34.2	144.0	0.00	3764	NOT RECOMMENDED
NA	3.00	SOLAR FILMS	0.0	0.0	0.00	0	NOT APPLICABLE
NA	4.00	INSULATED PANELS	0.0	0.0	0.00	0	NOT APPLICABLE
9227-1	5.00	CAULKING	23.5	102.0	0.83	85	RECOMMENDED-CRACK IN WALL
9227-6	6.00	WEATHER STRIPPING	6.5	27.0	0.00	237	NOT RECOMMENDED
NA	7.00	DOUBLE GLAZING	0.0	0.0	0.00	0	NOT APPLICABLE
NA	8.00	STORM WINDOWS	0.0	0.0	0.00	0	NOT APPLICABLE
NA	9.00	INSULATION	0.0	0.0	0.00	0	INSULATION IS SUFFICIENT
ELECTRICAL *							
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0	REFER TO PROJECT 13
9227-11	13.00	REPLACE INCAN W/FLUORESCENT	27.6	299.0	1.00	298	RECOMMENDED
NA	14.00	REDUCE LIGHT LEVELS	0.0	0.0	0.00	0	REFER TO PROJECT 13
MECHANICAL *							
9227-15	19.10	INSULATE WATER HEATER-KITCHEN	3.0	14.8	1.83	27	RECOMMENDED
9227-19	19.20	INSULATE WATER HEATER-PIN ROOM	2.0	8.2	3.28	27	RECOMMENDED
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0	SEE PROJECT 21
9227-23	21.10	WATER HEATER SHUTOFF-KITCHEN	0.1	0.4	0.00	219	NOT RECOMMENDED
9227-28	21.20	WATER HEATER SHUTOFF-PIN RM	0.1	0.4	0.00	219	NOT RECOMMENDED
9227-33	22.10	LOWER KITCHEN HW TEMP	15.0	20.0	2.50	50	RECOMMENDED
9227-37	22.20	LOWER PIN ROOM HW TEMP	3.0	-36.2	0.00	50	NOT RECOMMENDED
9227-41	23.00	HOT WATER BOOSTERS	11.0	88.0	3.78	333	RECOMMENDED

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE

** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR PAYBACK SAVINGS PER YR	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 9227 (CONTINUED)							
NA	27.00	CHANGE TO VAV SYSTEM	0.0	0.0	0.0	0	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0	HOOD OFF WHEN NOT IN USE
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0	NOT REQUIRED
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0	AIR BALANCE W/KITCHEN IS OK
9227-48	31.00	AIR CURTAINS	26.0	109.8	1.20	1515	RECOMMENDED
NA	35.00	ECONOMIZER CYCLE	0.0	0.0	0.00	0	ALREADY SCHEDULED
NA	36.00	BALANCE HVAC	0.0	0.0	0.00	0	COMPLETE BALANCE SCHEDULED
NA	38.00	UPGRADE CONTROLS	0.0	0.0	0.00	0	UPGRADE ALREADY SCHEDULED
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0	NO CHANGE REQUIRED
9227-52	40.00	HVAC OPERATIONS	93.7	402.0	0.07	30	RECOMMENDED
9227-55	44.00	NIGHT SETBACK	29.0	77.0	5.94	457	RECOMMENDED
9227-58	46.00	INFRARED HEATERS	113.2	465.0	0.00	8961	NOT RECOMMENDED
9227-62	49.00	PIPE INSULATION	49.3	224.0	2.12	475	RECOMMENDED
9227-65	52.00	KITCHEN HEAT RECOVERY	44.0	239.0	0.00	4913	NOT RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0	NO DISHWASHER IN BUILDING
9227-70	55.10	KITCH EXH HEAT RECOV AIR/AIR	61.2	279.0	0.00	7345	NOT RECOMMENDED
9227-74	55.20	KITCH EXH HEAT RECOV-RUNAROUND	61.2	279.0	0.00	19223	NOT RECOMMENDED
BUILDING 20020							
ARCHITECTURAL **							
20020-1	1.00	REDUCE GLASS AREA	4.6	24.0	0.00	4439	NOT RECOMMENDED
GEN-8	2.00	VESTIBULES	34.2	188.0	0.00	3764	NOT RECOMMENDED
NA	3.00	SOLAR FILMS	0.0	0.0	0.00	0	ALREADY IN USE
20020-4	4.00	INSULATED PANELS	20.5	105.0	0.00	2891	NOT RECOMMENDED
NA	5.00	CAULKING	0.0	0.0	0.00	0	NOT REQUIRED
20020-7	6.00	WEATHER STRIPPING	1.6	10.0	1.70	17	RECOMMENDED
20020-12	7.00	DOUBLE GLAZING	4.9	35.0	0.00	5717	NOT RECOMMENDED
20020-15	8.00	STORM WINDOWS	23.9	170.0	0.00	4516	NOT RECOMMENDED
20020-18	9.00	INSULATION	8.7	43.0	0.00	3285	NOT RECOMMENDED
ELECTRICAL							
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0	NO CHANGE REQUIRED
NA	13.00	REPL INCAND. W/FLUORESCENT	0.0	0.0	0.00	0	NO CHANGE REQUIRED
NA	14.00	REDUCE LIGHTING LEVELS	0.0	0.0	0.00	0	NO CHANGE REQUIRED
MECHANICAL **							
20020-21	19.10	INSULATE WATER HEATER-KITCHEN	14.0	51.7	0.52	27	RECOMMENDED
20020-25	19.20	INSULATE WATER HEATER-LOCKERS	4.0	16.5	1.64	27	RECOMMENDED
NA	20.00	WATER HTR TEMP CNTRL	0.0	0.0	0.00	0	SEE PROJECT 21
20020-29	21.10	WATER HEATER SHUTOFF-KITCHEN	0.4	1.4	0.00	82	NOT RECOMMENDED
20020-34	21.20	WATER HEATER SHUTOFF-LOCKER	0.1	0.3	0.00	82	NOT RECOMMENDED
20020-39	22.10	LOWER DOM HW TEMP-KIT	36.0	86.4	0.58	50	RECOMMENDED
20020-43	22.20	LOWER DOM HW TEMP-LKR/RRMS	90.0	293.5	0.17	50	RECOMMENDED
NA	23.00	HOT WATER BOOSTERS	0.0	0.0	0.00	0	NOT REQUIRED
20020-47	27.00	CHANGE TO VAV SYSTEM	27.5	105.0	0.00	2455	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0	NOT REQUIRED
20020-50	29.00	KITCHEN MAKEUP AIR	12.3	22.0	0.00	4687	NOT RECOMMENDED
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0	AIR BALANCE W/KITCHEN IS OK

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE

** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 20020 (CONTINUED)								
20020-56	31.00	AIR CURTAINS	6.0	18.1	0.00	0.62	788	NOT RECOMMENDED
20020-60	35.00	ECONOMIZER CYCLE	13.7	52.0	0.00	0.15	2905	NOT RECOMMENDED
20020-63	36.00	BALANCE HVAC SYSTEM	90.0	505.0	0.00	0.94	2227	NOT RECOMMENDED
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	SEE PROJECTS 27, 35, AND 44
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0.00	0	NO CHANGES REQUIRED
20020-66	40.00	HVAC OPERATIONS	171.8	624.0	0.05	20.95	30	RECOMMENDED
20020-69	44.00	NIGHT SETBACK	114.0	519.0	0.88	11.71	457	RECOMMENDED
NA	46.00	INFRARED HEATERS	0.0	0.0	0.00	0.00	0	CEILING TOO LOW
20020-72	49.00	PIPE INSULATION	17.2	117.7	1.00	19.50	118	RECOMMENDED
20020-75	51.00	STOCKROOM VENTILATION	-4.6	3.0	0.00	0.06	511	NOT RECOMMENDED
20020-79	52.00	KITCHEN HEAT RECOVERY	62.0	260.0	0.00	0.45	4913	NOT RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0.00	0	NO DISHWASHER IN BLDG
20020-84	55.10	KITCH EXH HEAT RECOV AIR/AIR	59.6	408.0	0.00	0.63	7345	NOT RECOMMENDED
20020-88	55.20	KITCH EXH HEAT RECOV-RUNAROUND	59.6	408.0	0.00	0.24	19223	NOT RECOMMENDED
BUILDING 30101								
ARCHITECTURAL **								
30101-1	1.00	REDUCE GLASS AREA	153.2	852.0	0.00	0.40	31907	NOT RECOMMENDED
GEN-8	2.00	VESTIBULES	34.2	188.0	0.00	0.75	3764	NOT RECOMMENDED
30101-4	3.00	SOLAR FILMS	122.4	779.0	0.00	0.83	3866	NOT RECOMMENDED
30101-7	4.00	INSULATED PANELS	65.2	802.0	0.00	0.59	20256	NOT RECOMMENDED
NA	5.00	CAULKING	0.0	0.0	0.00	0.00	0	NOT REQUIRED
30101-10	6.00	WEATHER STRIPPING	10.3	65.0	0.00	0.74	386	NOT RECOMMENDED
30101-16	7.00	DOUBLE GLAZING	59.4	700.0	0.00	0.35	39013	NOT RECOMMENDED
30101-19	8.00	STORM WINDOWS	77.6	893.0	15.04	1.30	13433	RECOMMENDED
30101-22	9.00	INSULATION	96.9	600.0	0.00	0.70	13653	NOT RECOMMENDED
ELECTRICAL								
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0.00	0	LIGHTING IS EFFICIENT
NA	13.00	REPLACE INCAN W/FLUORESCENT	0.0	0.0	0.00	0.00	0	LIGHTING IS FLUORESCENT
NA	14.00	REDUCE LIGHT LEVELS	0.0	0.0	0.00	0.00	0	LEVEL IS LOW ENOUGH
NA	16.00	TRANSFORMER OVERVOLTAGE	0.0	0.0	0.00	0.00	0	NO OVERVOLTAGE EXISTS
MECHANICAL **								
30101-25	19.00	WATER HEATER INSULATION	1.0	6.6	4.11	3.01	27	RECOMMENDED
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0.00	0	SEE PROJECT 21
NA	21.00	WATER HEATER SHUTOFF	0.0	0.0	0.00	0.00	0	24 HR SCHEDULE
30101-29	22.00	LOWER DOMESTIC HW TEMP	11.0	23.1	2.17	8.97	50	RECOMMENDED
30101-33	23.00	HOT WATER BOOSTERS	39.0	428.0	0.78	11.06	333	RECOMMENDED
30101-37	27.00	CHANGE TO VAV SYSTEM	161.1	614.0	0.00	0.53	9820	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0.00	0	HOOD IS OFF WHEN NOT IN USE
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0.00	0	ALREADY IN USE
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0.00	0	BALANCE W/KITCHEN IS OK
30101-40	31.00	AIR CURTAINS	14.0	53.0	0.00	0.64	1515	NOT RECOMMENDED
30101-44	35.00	ECONOMIZER CYCLE	172.1	656.0	0.00	0.44	12563	NOT RECOMMENDED
30101-48	36.00	BALANCE HVAC	188.5	1033.0	0.00	0.77	5543	NOT RECOMMENDED
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	SEE PROJECTS 27 AND 35
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0.00	0	NO CHANGES REQUIRED

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE

** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 30101 (CONTINUED)								
30101-52	40.00	HVAC OPERATIONS	594.3	2234.0	0.01	75.10	30	RECOMMENDED
NA	44.00	NIGHT SETBACK CONTROL	0.0	0.0	0.00	0.00	0	24 HOUR OCCUPANCY
NA	46.00	INFRARED HEATERS	0.0	0.0	0.00	0.00	0	CEILING HEIGHT TOO LOW
30101-59	49.00	PIPE INSULATION	18.4	117.0	1.07	17.85	125	RECOMMENDED
30101-63	52.00	KITCHEN HEAT RECOVERY	116.0	941.0	8.25	1.41	7760	RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0.00	0	NO DISHWASHER IN BUILDING
30101-68	55.10	KITCH EXH HEAT RECOV AIR/AIR	71.5	490.0	0.00	0.75	7345	NOT RECOMMENDED
30101-72	55.20	KITCH EXH HEAT RECOV-RUNAROUND	71.5	490.0	0.00	0.29	19223	NOT RECOMMENDED
BUILDING 30501								
MECHANICAL								
NA	34.00	SEAL AHU LEAKS	0.0	0.0	0.00	0.00	0	BLDG HAS CABINET FAN COILS
BUILDING 40110								
ARCHITECTURAL **								
40110-1	1.00	REDUCE GLASS AREA	23.4	136.0	0.00	0.28	7498	NOT RECOMMENDED
GEN-8	2.00	VESTIBULES	34.2	188.0	0.00	0.75	3764	NOT RECOMMENDED
40110-4	3.00	SOLAR FILMS	30.2	192.0	0.00	0.90	909	NOT RECOMMENDED
40110-7	4.00	INSULATED PANELS	31.3	197.0	0.00	0.64	4760	NOT RECOMMENDED
NA	5.00	CAULKING	0.0	0.0	0.00	0.00	0	NOT REQUIRED
40110-10	6.00	WEATHER STRIPPING	6.3	40.0	0.00	0.74	237	NOT RECOMMENDED
40110-15	7.00	DOUBLE GLAZING	40.0	272.0	0.00	0.49	9168	NOT RECOMMENDED
40110-18	8.00	STORM WINDOWS	55.3	376.0	8.04	2.07	3024	RECOMMENDED
40110-21	9.00	INSULATION	25.9	160.0	0.00	0.67	3791	NOT RECOMMENDED
ELECTRICAL								
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
NA	13.00	REPLACE INCAN W/FLUORESCENT	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
NA	14.00	REDUCE LIGHT LEVELS	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
MECHANICAL **								
40110-24	19.00	WATER HEATER INSULATION	1.0	8.4	3.23	3.84	27	RECOMMENDED
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0.00	0	SEE PROJECT 21
NA	21.00	WATER HEATER SHUTOFF	0.0	0.0	0.00	0.00	0	24 HOUR SCHEDULE
NA	22.00	LOWER DOMESTIC HW TEMP	0.0	0.0	0.00	0.00	0	NOT REQUIRED - 140 F
40110-28	23.00	HOT WATER BOOSTERS	7.0	207.0	1.61	5.75	333	RECOMMENDED
40110-33	27.00	CHANGE TO VAV SYSTEM	35.5	135.0	0.00	0.23	4910	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0.00	0	HOOD OFF WHEN NOT IN USE
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0.00	0	NO CHANGES REQUIRED
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0.00	0	KITCHEN BALANCE IS OK
40110-36	31.00	AIR CURTAINS	3.0	36.0	0.00	0.41	1515	NOT RECOMMENDED
40110-40	35.00	ECONOMIZER CYCLE	42.7	163.0	0.00	0.34	4047	NOT RECOMMENDED
40110-43	36.00	BALANCE HVAC SYSTEM	100.2	583.0	3.23	1.29	1883	RECOMMENDED
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	NOT REQUIRED-ALL NEW
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0.00	0	NO CHANGES REQUIRED
40110-46	40.00	HVAC OPERATIONS	63.1	210.0	0.14	7.02	30	RECOMMENDED
NA	44.00	NIGHT SETBACK CONTROL	0.0	0.0	0.00	0.00	0	24 HOUR OCCUPANCY

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE
 ** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 40110 (CONTINUED)								
40110-49	46.00	INFRARED HEATERS	185.1	757.0	0.00	0.54	9941	NOT RECOMMENDED
NA	49.00	PIPE INSULATION	0.0	0.0	0.00	0.00	0	NEW INSULATION
40110-53	52.00	KITCHEN HEAT RECOVERY	38.0	322.0	0.00	0.74	4990	NOT RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0.00	0	NO DISHWASHER IN BUILDING
40110-59	55.10	KITCH EXH HEAT RECOV AIR/AIR	71.5	490.0	0.00	0.75	734.5	NOT RECOMMENDED
40110-63	55.20	KITCH EXH HEAT RECOV-RUNAROUND	71.5	490.0	0.00	0.29	19223	NOT RECOMMENDED
BUILDING 50101								
ARCHITECTURAL **								
50101-1	1.00	REDUCE GLASS AREA	50.6	296.0	0.00	0.38	12136	NOT RECOMMENDED
GEN-8	2.00	VESTIBULES	34.2	188.0	0.00	0.75	3764	NOT RECOMMENDED
50101-4	3.00	SOLAR FILMS	43.0	282.0	0.00	0.89	1317	NOT RECOMMENDED
50101-7	4.00	INSULATED PANELS	71.4	439.0	0.00	0.63	11037	NOT RECOMMENDED
NA	5.00	CAULKING	0.0	0.0	0.00	0.00	0	NOT REQUIRED
NA	6.00	WEATHER STRIPPING	0.0	0.0	0.00	0.00	0	NOT REQUIRED AT THIS TIME
50101-10	7.00	DOUBLE GLAZING	57.3	389.0	0.00	0.47	13863	NOT RECOMMENDED
50101-13	8.00	STORM WINDOWS	79.7	542.0	8.44	1.97	4575	RECOMMENDED
50101-16	9.00	INSULATION	23.7	146.0	0.00	0.66	3518	NOT RECOMMENDED
ELECTRICAL								
NA	12.00	EFFICIENT LIGHTING	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
NA	13.00	REPLACE INCAN W/FLUORESCENT	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
NA	14.00	REDUCE LIGHT LEVELS	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
NA	16.00	TRANSFORMER OVERVOLTAGE	0.0	0.0	0.00	0.00	0	NO OVERVOLTAGE EXISTS
MECHANICAL **								
50101-19	19.00	WATER HEATER INSULATION	4.0	25.0	1.08	11.48	27	RECOMMENDED
NA	20.00	WATER HEATER TEMP CONTROL	0.0	0.0	0.00	0.00	0	SEE PROJECT 21
NA	21.00	WATER HEATER SHUTOFF	0.0	0.0	0.00	0.00	0	24 HOUR SCHEDULE
50101-23	22.00	LOWER DOMESTIC HW TEMP	27.0	134.5	0.37	34.36	50	RECOMMENDED
50101-28	23.00	HOT WATER BOOSTERS	35.0	401.0	0.83	10.40	333	RECOMMENDED
50101-33	27.00	CHANGE TO VAV SYSTEM	39.6	151.0	0.00	0.26	4910	NOT RECOMMENDED
NA	28.00	RANGE HOOD SHUTOFF	0.0	0.0	0.00	0.00	0	HOOD OFF WHEN NOT IN USE
NA	29.00	KITCHEN MAKEUP AIR	0.0	0.0	0.00	0.00	0	ALREADY IN USE
NA	30.00	POSITIVE KITCHEN PRESSURE	0.0	0.0	0.00	0.00	0	AIR BALANCE W/KITCHEN IS OK
50101-35A	31.00	AIR CURTAINS	3.0	6.1	0.00	0.21	1515	NOT RECOMMENDED
50101-36	35.00	ECONOMIZER CYCLE	42.6	162.0	0.00	0.34	4047	NOT RECOMMENDED
NA	36.00	BALANCE HVAC	0.0	0.0	0.00	0.00	0	BALANCE IS SATISFACTORY
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0.00	0	CONTROLS ARE NEW
NA	39.00	DINING ROOM OPERATIONS	0.0	0.0	0.00	0.00	0	NO CHANGE REQUIRED
NA	40.00	HVAC OPERATIONS	0.0	0.0	0.00	0.00	0	24 HOUR SCHEDULE
NA	44.00	NIGHT SETBACK CONTROL	0.0	0.0	0.00	0.00	0	24 HOUR OCCUPANCY
50101-40	46.00	INFRARED HEATERS	172.0	349.0	0.00	-1.14	11274	NOT RECOMMENDED
NA	49.00	PIPE INSULATION	0.0	0.0	0.00	0.00	0	NOT REQUIRED
50101-44	52.00	KITCHEN HEAT RECOVERY	84.0	701.0	8.87	1.31	6221	RECOMMENDED
NA	54.00	DISHWASHER HEAT RECOVERY	0.0	0.0	0.00	0.00	0	NO DISHWASHER IN BUILDING
50101-49	55.10	KITCH EXH HEAT RECOV AIR/AIR	71.5	490.0	0.00	0.75	7345	NOT RECOMMENDED
50101-53	55.20	KITCH EXH HEAT RECOV-RUNAROUND	71.5	490.0	0.00	0.29	19223	NOT RECOMMENDED

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 ** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-5

ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	SIR	CONTRACT COST DOLLARS	REMARKS
BUILDING 50105							
ELECTRICAL							
NA	16.00	TRANSFORMER OVERVOLTAGE	0.0	0.0	0.00	0	NO OVERVOLTAGE EXISTS
MECHANICAL							
NA	38.00	UPGRADE HVAC CONTROLS	0.0	0.0	0.00	0	NEW CONTROLS TO BE INSTALLED
AIRCRAFT HANGARS							
ELECTRICAL **							
HANGAR-1	12.01	EFFICIENT LIGHTING	269.9	2194.0	7.30	16009	RECOMMENDED
HANGAR-5	12.02	EFFICIENT LIGHTING	269.9	2194.0	7.30	16009	RECOMMENDED
HANGAR-9	12.03	EFFICIENT LIGHTING	269.9	2194.0	7.30	16009	RECOMMENDED
HANGAR-13	12.04	EFFICIENT LIGHTING	301.6	2508.0	7.27	18246	RECOMMENDED
HANGAR-17	12.05	EFFICIENT LIGHTING	301.6	2508.0	7.27	18246	RECOMMENDED
HANGAR-21	12.06	EFFICIENT LIGHTING	641.3	2359.0	10.26	24211	RECOMMENDED
HANGAR-25	12.07	EFFICIENT LIGHTING	1375.8	5309.0	4.56	24211	RECOMMENDED
HANGAR-29	12.08	EFFICIENT LIGHTING	269.9	2194.0	7.30	16009	RECOMMENDED
HANGAR-33	12.09	EFFICIENT LIGHTING	269.9	2194.0	7.30	16009	RECOMMENDED
HANGAR-37	12.10	EFFICIENT LIGHTING	269.9	2194.0	7.30	16009	RECOMMENDED
HANGAR-41	12.11	EFFICIENT LIGHTING	394.8	1640.0	5.99	9825	RECOMMENDED
HANGAR-45	12.12	EFFICIENT LIGHTING	394.8	1640.0	5.99	9825	RECOMMENDED
BASEWIDE							
ELECTRICAL **							
NA	11.00	IMPROVE POWER FACTOR	0.0	0.0	0.00	0	NOT NECESSARY
BASEWIDE-1	15.00	TRANSFORMER LOADING	-86.6	-330.0	0.00	10042	NOT RECOMMENDED
NA	16.00	TRANSFORMER OVERVOLTAGE	0.0	0.0	0.00	0	BASEWIDE-VOLTAGE IS CORRECT
NA	17.00	REDUCE STREET LIGHTING	0.0	0.0	0.00	0	CURRENT LEVELS ACCEPTABLE
INCINERATOR							
MECHANICAL **							
INCIN-1	48.00	WOOD CHIP/REFUSE MIX	32850.0	-72533.0	0.00	250000	NOT RECOMMENDED
BLACK & VEATCH BASEWIDE ENERGY PLAN - REEVALUATION OF SPECIFIC EG'S **							
B&V-1	BV-1.00	RED VENT AIR QUANTITY	0.0	0.0	0.00	0	NOT RECOMMENDED
B&V-4	BV-2.01	WH INSUL-40 GAL NG	6.2	28.0	0.79	22	PREVIOUS STUDY REVALIDATION
B&V-7	BV-2.02	WH INSUL-40 GAL EL	3.3	13.0	1.69	22	PREVIOUS STUDY REVALIDATION
B&V-10	BV-2.03	WH INSUL-80 GAL NG	8.6	39.0	0.64	25	PREVIOUS STUDY REVALIDATION
B&V-13	BV-2.04	WH INSUL-80 GAL EL	4.7	18.0	1.44	26	PREVIOUS STUDY REVALIDATION
B&V-16	BV-2.05	WH INSUL-120 GAL NG	11.1	50.0	0.58	29	PREVIOUS STUDY REVALIDATION
B&V-19	BV-2.06	WH INSUL-120 GAL EL	6.2	24.0	1.29	31	PREVIOUS STUDY REVALIDATION
B&V-22	BV-3.00	VARIABLE AIR VOLUME	1492.5	5690.0	0.00	81950	PREVIOUS STUDY REVALIDATION
B&V-25	BV-4.00	ROOF SPRAY COOLING	118.0	677.0	13.35	9039	PREVIOUS STUDY REVALIDATION
B&V-28	BV-5.00	FLUSH VALVE RESTRICTORS	8,619,840 GAL	4944.0	3.28	16226	PREVIOUS STUDY REVALIDATION
NOTE: THERE ARE NO ENERGY SAVINGS ASSOCIATED WITH PROJECT BV-5.00. SAVINGS ARE IN GALLONS OF WATER.							
B&V-31	BV-6.00	FLUOR LIGHTING LOAD RED.	15161.3	50769.0	6.85	347582	PREVIOUS STUDY REVALIDATION

* REFER TO VOLUME II FOR SUPPORT CALCULATIONS NA - NOT APPLICABLE

** REFER TO VOLUME III FOR SUPPORT CALCULATIONS MH - MANHOUR

TABLE ES-6
EMCS ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
* BUILDING 106								
5	41.01	PKG 1-EMCS	130.0	-33.0	0.00	0.02	12065	NOT RECOMMENDED
8	41.02	PKG 2-EMCS	172.0	130.0	0.00	0.20	12630	NOT RECOMMENDED
11	41.03	PKG 3-EMCS	150.0	-155.0	0.00	-0.05	16061	NOT RECOMMENDED
* BUILDING 113								
25	41.01	PKG 1-EMCS	1708.0	4331.0	0.00	0.59	69566	NOT RECOMMENDED
28	41.02	PKG 2-EMCS	2265.0	6456.0	0.00	0.89	75595	NOT RECOMMENDED
31	41.03	PKG 3-EMCS	2336.0	5626.0	0.00	0.56	91520	NOT RECOMMENDED
34	41.08	PKG 8-EMCS	154.0	-411.0	0.00	-0.04	22279	NOT RECOMMENDED
37	41.09	PKG 9-EMCS	309.0	1452.0	0.00	-0.13	57167	NOT RECOMMENDED
40	41.11	PKG 11-EMCS	0.5	-738.0	0.00	-0.45	14794	NOT RECOMMENDED
43	41.12	PKG 12-EMCS	54.0	-403.0	0.00	-0.31	12187	NOT RECOMMENDED
46	41.13	PKG 13-EMCS	0.0	0.0	0.00	4.54	12421	NOT RECOMMENDED
* BUILDING 2908								
60	41.01	PKG 1-EMCS	744.0	1514.0	0.00	0.37	37059	NOT RECOMMENDED
63	41.02	PKG 2-EMCS	890.0	1903.0	0.00	0.44	41690	NOT RECOMMENDED
66	41.03	PKG 3-EMCS	1030.0	1537.0	0.00	0.23	58408	NOT RECOMMENDED
69	41.08	PKG 8-EMCS	32.7	-517.0	0.00	-0.31	13317	NOT RECOMMENDED
72	41.09	PKG 9-EMCS	32.7	-1108.0	0.00	-0.38	25126	NOT RECOMMENDED
75	41.11	PKG 11-EMCS	0.9	-668.0	0.00	-0.45	13428	NOT RECOMMENDED
78	41.12	PKG 12-EMCS	57.0	-393.0	0.00	-0.30	12186	NOT RECOMMENDED
81	41.13	PKG 13-EMCS	0.0	0.0	0.00	5.03	12421	RECOMMENDED
* BUILDING 9224								
89	41.01	PKG 1-EMCS	94.0	-196.0	0.00	-0.09	12127	NOT RECOMMENDED
92	41.02	PKG 2-EMCS	1.3	-34.0	0.00	-0.95	322	NOT RECOMMENDED
95	41.03	PKG 3-EMCS	94.0	-500.0	0.00	-0.21	18264	NOT RECOMMENDED
* BUILDING 9227								
106	41.01	PKG 1-EMCS	0.0	-405.0	0.00	-0.30	12127	NOT RECOMMENDED
109	41.02	PKG 2-EMCS	60.0	-180.0	0.00	-0.09	12691	NOT RECOMMENDED
112	41.03	PKG 3-EMCS	47.4	-308.0	0.00	-0.21	13810	NOT RECOMMENDED
115	41.09	PKG 9-EMCS	10.9	-1225.0	0.00	-0.43	25490	NOT RECOMMENDED
* BUILDING 20020								
126	41.01	PKG 1-EMCS	131.0	-16.0	0.00	0.03	12127	NOT RECOMMENDED
129	41.02	PKG 2-EMCS	207.0	273.0	0.00	0.28	12691	NOT RECOMMENDED
132	41.09	PKG 9-EMCS	0.7	-1253.0	0.00	-0.45	25126	NOT RECOMMENDED
135	41.13	PKG 3-EMCS	137.0	-302.0	0.00	-0.12	18264	NOT RECOMMENDED
* BUILDING 30101								
146	41.01	PKG 1-EMCS	50.4	-1175.0	0.00	-0.36	30114	NOT RECOMMENDED
149	41.02	PKG 2-EMCS	43.0	-1324.0	0.00	-0.38	32447	NOT RECOMMENDED
152	41.03	PKG 3-EMCS	119.2	-2330.0	0.00	-0.37	58467	NOT RECOMMENDED
155	41.09	PKG 9-EMCS	27.4	-1132.0	0.00	-0.39	25126	NOT RECOMMENDED
158	41.11	PKG 11-EMCS	0.8	-742.0	0.00	-0.45	14902	NOT RECOMMENDED

* REFER TO VOLUME IV FOR SUPPORT CALCULATIONS

TABLE ES-6

EMCS ECO SUMMARY

REFERENCE PAGE	PROJECT NUMBER	DESCRIPTION	ENERGY SAVINGS MBTU/YR	DOLLAR SAVINGS PER YR	PAYBACK YEARS	SIR	CONTRACT COST DOLLARS	REMARKS
* BUILDING 40110								
170	41.01	PKG 1-EMCS	30.2	-543.0	0.00	-0.33	14933	NOT RECOMMENDED
173	41.02	PKG 2-EMCS	29.1	-677.0	0.00	-0.36	17497	NOT RECOMMENDED
176	41.03	PKG 3-EMCS	47.3	-895.0	0.00	-0.35	23268	NOT RECOMMENDED
179	41.08	PKG 8-EMCS	8.0	-629.0	0.00	-0.42	13317	NOT RECOMMENDED
182	41.09	PKG 9-EMCS	9.0	-1215.0	0.00	-0.43	25126	NOT RECOMMENDED
185	41.11	PKG 11-EMCS	0.8	-742.0	0.00	-0.45	14902	NOT RECOMMENDED
* BUILDING 50101								
196	41.01	PKG 1-EMCS	20.2	-848.0	0.00	-0.38	20264	NOT RECOMMENDED
199	41.02	PKG 2-EMCS	18.1	-917.0	0.00	-0.39	21457	NOT RECOMMENDED
202	41.03	PKG 3-EMCS	37.2	-1308.0	0.00	-0.39	30755	NOT RECOMMENDED
205	41.09	PKG 9-EMCS	10.9	-1207.0	0.00	-0.43	25126	NOT RECOMMENDED
208	41.11	PKG 11-EMCS	0.8	-731.0	0.00	-0.45	14683	NOT RECOMMENDED

* REFER TO VOLUME IV FOR SUPPORT CALCULATIONS