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Energy Engineering Analysis Program (EEAP)

Limited Energy Study - LIGHTING
Fort Campbell, Kentucky

Final Report

Volume 1
Sections 1-5

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SYSTEMS corp
SYSTEMS ENGINEERING AND MANAGEMENT CORPORATION

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1.1 SYNOPSIS

Systems Corp surveyed and completed energy analyses for 95 representative buildings at Fort Campbell, categorized as Korean War Barracks, Airfield Buildings, and Blanchfield Hospital buildings B and C. The energy conservation opportunities (ECOs) evaluated were high efficiency interior and exterior lighting, and indoor lighting controls. Cost estimates were prepared using MeansData for Windows Spreadsheets, Version 2 0a. Life cycle cost analyses were performed using the Life Cycle Cost in Design (LCCID) computer program. Project development brochures (PDBs) and DD1391 forms were prepared for four Energy Conservation Investment Program (ECIP) projects. The total of the four projects that were developed represent $385,283 in annual savings with a simple payback of 6.37 years and a saving to investment ratio (SIR) of 1.89.

1.2 INTRODUCTION

Systems Engineering and Management Corporation (Systems Corp) was contracted by the Louisville District of the United States Army Corps of Engineers in June 1994 to perform a limited energy study for 95 buildings at Fort Campbell, Kentucky. The project includes a study of interior and exterior lighting, as well as controls.

1.2.1 Scope of Work

1. Evaluate selected energy conservation opportunities (ECOs) to determine their energy savings potential and economic feasibility.

2. Conduct a limited site survey of selected buildings or areas to insure that any methods of energy conservation which are practical and have not been evaluated in any previous energy study have been considered and the results documented.

3. Determine efficiency of existing systems. Determine the replacement option with the highest SIR.

4. Provide complete programming or implementation documentation for all recommended ECOs.

5. Prepare a comprehensive report to document the work performed, the results, and the recommendations.

1.2.2 Organization of the Final Report

The submitted material for this report consists of the following:

Volume I: Executive Summary, Methods and Approach, Project I: Interior/Exterior Lighting at Airfield, Project II: Lighting Controls at Airfield, Project III: Interior Lighting and Controls at Blanchfield Hospital, Project IV: Interior Lighting at Korean War Barracks

Volume II: Scope of Work:, Interim Review Comments and Responses, and Interim Review Presentation

1.3 PRESENT AND HISTORICAL ELECTRICAL ENERGY CONSUMPTION

The baseline energy consumptions and the energy conservation opportunity energy consumption were determined using spreadsheets and manual calculating to model system energy consumption. These have been included in *Section 2* of this report.

The electric energy consumption, demand, and total costs for FY93 are shown in *Table 1.3.1 Fort Campbell Electric*. *Figure 1.3.1* is a bar graph of the monthly consumption and cost for FY93. The electric costs used to calculate the electric cost savings for the project are as follows:

COST/kWh = $0.02114/kWh (No Demand)
COST/MBtu = $6.18/MBtu (No Demand)
COST/kW = $11.78/kW (Monthly Demand)

1.4 ENERGY CONSERVATION OPPORTUNITIES INVESTIGATED

Systems Corp analyzed two energy conservation opportunities (ECOs) at Fort Campbell, Kentucky. The analysis was performed utilizing energy models developed by Systems Corp and data collected during the field survey of the facilities at Fort Campbell. Each ECO was evaluated to determine the potential energy savings, dollar savings, implementation costs, simple payback, life cycle cost, and savings to investment ratio (SIR) The two ECOs that were evaluated are as follows:

ECO - 1 High Efficiency Interior/Exterior Lighting

ECO - 2 Lighting Controls

Table 1.3.1

Fort Campbell Electric

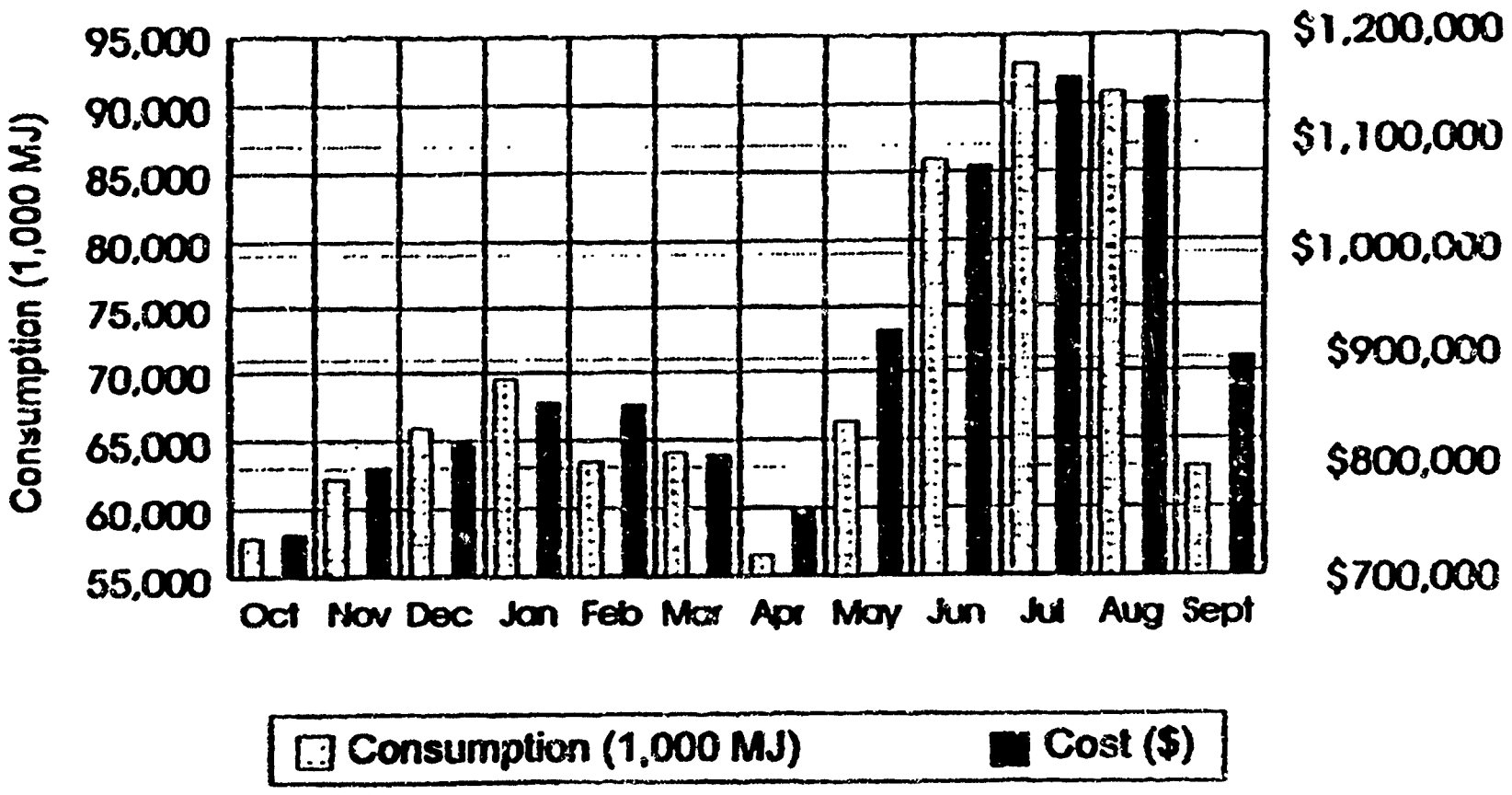
FY93

Month	Demand (KW)	Consumption (KWH)	Total Cost	Cost/KWH
Oct '92	31,072	16,077,600	$739,348	$0.046
Nov	34,020	17,287,200	$800,806	$0.046
Dec	33,907	18,320,400	$821,704	$0.045
Jan '93	35,361	19,307,400	$860,667	$0.045
Feb	36,140	17,644,200	$857,977	$0.049
Mar	33,944	17,506,000	$811,111	$0.046
Apr	34,663	15,691,200	$760,262	$0.048
May	43,697	18,429,600	$926,917	$0.050
Jun	47,212	23,572,800	$1,061,048	$0.045
Jul	50,009	25,800,600	$1,160,394	$0.045
Aug	49,556	25,229,400	$1,141,714	$0.045
Sep	43,281	17,486,800	$902,293	$0.052
TOTAL	*474,862*	*232,957,200*	*$10,864,239*	*$0.047*
Min	31,072	15,691,200	$739,348	$0.045
Max	50,009	25,800,600	$1,160,394	$0.052
Avg	39,574	19,413,100	$905,353	$0.047

Figure 1.3.1

Fort Campbell Electric

FY93



...tems Corp's energy analysis models were used to determine the savings achieved for implementing each ECO in the facilities that were evaluated. Means Data for Windows Spreadsheets, Version 2.0a cost estimating software was used to estimate the implementation cost of each ECO in each facility evaluated. The U.S. Army Corps of Engineers' Life Cycle Cost in Design, Version 1.0, Level 80, software was used to perform life cycle cost analyses and determine the SIR of each ECO for each facility evaluated.

1.4.1 ECOs Recommended

Systems Corp recommended that both of the ECOs evaluated be implemented, but not in every area surveyed. The following is a list of the ECOs recommended to be implemented by area surveyed. The criteria for recommendation is a favorable simple payback and savings to investment ratio (SIR).

ECO - 1: Airfield Buildings
Blanchfield Hospital
Korean War Barracks

ECO - 2: Airfield Buildings
Blanchfield Hospital

1.4.2 ECOs Rejected

ECO-2, Lighting Controls, in the Korean War Barracks was rejected due to the large investment required for the proper controls set-up. The best opportunity for lighting controls was in the latrine areas. Due to multiple walls and sections, multiple overhead occupancy sensors would be required. Good energy savings were available, but the high investment costs gave the project a poor simple payback and SIR.

1.4.3 ECIP Projects Developed

Systems Corp developed four ECIP/FEMP projects. The projects included interior/exterior lighting in 28 buildings at the Airfield, lighting controls in 15 buildings at the Airfield, interior lighting and controls at Blanchfield Hospital, and interior lighting at 44 Korean War Barracks. The following table summarizes the savings and investments for each project

TABLE 1.4.3
FORT CAMPBELL LIGHTING ENERGY STUDY
ECIP PROJECT SUMMARY

PROJECT NUMBER	DESCRIPTION	1ST YEAR SAVINGS	TOTAL INVESTMENT	SPB (YRS)	SIR
1	INTERIOR LIGHTING AT AIRFIELD (ECO 1)	$130,855	$709,900	5.43	2.21
2	LIGHTING CONTROLS AT AIRFIELD (ECO 2)	$26,208	$60,078	2.29	5.21
3	INTERIOR LIGHTING AND LIGHTING CONTROLS AT HOSPITAL (ECO 1 & 2)	$79,518	$424,003	5.33	2.27
4	INTERIOR LIGHTING AT KOREAN WAR BARRACKS (ECO 1)	$148,900	$1,260,715	8.47	1.43
PROJECT TOTALS		**$385,283**	**$2,454,696**	**6.37**	**1.89**

2 METHODS AND APPROACH

2.1 FIELD SURVEY

The field survey as performed by Systems Corp was designed to provide the necessary data required to complete the Scope of Work for this project. It was also designed to provide residual benefits to the installation by providing an organized and readily available source of information which can be used in future years. The information was transmitted in the form of field notes using standardized survey forms.

The survey forms were designed to allow notations of all data which could be utilized (not necessarily required) to calculate the energy savings gained by implementing a specific energy conservation opportunity. These forms contain data obtained from as-built drawings and confirmed in the field, as well as data obtained only in the field. *Table 2.1.1* lists the buildings surveyed, sorted by type.

2.1.1 Interior/Exterior Lighting

Thorough preparation for the building survey ensures that the data required to perform the technical analysis is obtained. The building surveys were performed in a manner which assured the best results. A simple listing of each step of the process best describes our approach to the surveys.

1. The list of ECOs included in the work scope were reviewed in detail.
2. Each ECO was given an identification number which is used consistently throughout the project.
3. An expanded description of each ECO was formulated to outline the possible methods for implementation of the ECO.
4. Survey forms were developed for each ECO to provide space to enter any data which might possibly be used in performing the engineering and economic analysis of the ECO.
5. A list of the types of as-built drawings required for the buildings was prepared based on the information required on the ECO survey forms.
6. The building surveys are then performed, confirming or revising data obtained from the drawings. Additional data is obtained as required.

Note: A Systems Corp representative assisted during the survey in gathering the necessary as-built drawings. Due to the age of drawings, most of the required information was gathered during the survey, while physically present at the buildings.

Systems Corp survey teams met with the post Energy Officer throughout the survey on an as-needed basis.

TABLE 2.1.1
BUILDINGS SURVEYED

BUILDING TYPE	BUILDING NUMBER	BUILDING AREA (SQ FT)
HOSPITAL		
	650	227,735
	TOTAL AREA THIS TYPE	227,735
BARRACKS		
	3211	39,722
	3212	39,722
	3213	42,627
	3214	42,627
	3215	39,809
	3216	39,809
	3217	39,722
	3218	39,722
	6709	36,145
	6710	36,406
	6711	38,329
	6712	38,585
	6718	31,869
	6719	31,779
	6725	38,241
	6726	38,160
	6727	38,312
	6728	38,285
	6730	38,138
	6731	38,208
	6732	38,442
	6733	37,977
	6909	31,758
	6910	38,089
	6911	38,280
	6912	38,310
	6917	38,480
	6918	38,645
	6919	38,711
	6920	38,849
	6921	38,512
	6922	38,391
	6923	38,465
	6927	38,118
	6928	38,120

TABLE 2.1.1
BUILDINGS SURVEYED

BUILDING TYPE	BUILDING NUMBER	BUILDING AREA (SQ FT)
BARRACKS (CONT)	6929	38,281
	6930	38,196
	6931	31,713
	6936	31,735
	6937	37,900
	6938	38,039
	6939	38,137
	6940	38,127
	6942	38,096
	6943	38,049
	6944	38,063
	6945	31,685
	7110	23,628
	7112	25,625
	7118	25,625
	7120	25,625
	TOTAL AREA THIS TYPE	1,877,991
AIRFIELD SUPPORT FACILITIES	7109	192
	7141	192
	7150	9237
	7155	4518
	7157	9849
	7158	100
	7159	4259
	7162	1256
	7164	3106
	7165	954
	7170	8400
	7178	3230
	7179	9300
	7187	1734
	7212	1849
	7287	29744
	TOTAL AREA THIS TYPE	83,719

TABLE 2.1.1
BUILDINGS SURVEYED

BUILDING TYPE	BUILDING NUMBER	BUILDING AREA (SQ FT)
HANGAR		
	7152	20511
	7154	36677
	7158	34785
	7206	24178
	7208	41912
	7210	32611
	7214	41800
	7218	41800
	7243	41117
	7245	49139
	7249	49139
	7161	11218
	7262	59243
	7264	60000
	7268	60400
	7272	40548
	TOTAL AREA THIS TYPE	665,198
DINING FACILITIES		
	7114	7173
	TOTAL AREA THIS TYPE	7,173
ADMINISTRATIVE		
	7131	15404
	7133	15404
	7145	2581
	7163	11756
	TOTAL AREA THIS TYPE	43,145

TABLE 2.1.1
BUILDINGS SURVEYED

BUILDING TYPE	BUILDING NUMBER	BUILDING AREA (SQ FT)
STORAGE		
	7134	17950
	7177	5512
	7281	12500
	TOTAL AREA THIS TYPE	36,962
MEDICAL CLINIC		
	7149	9248
	TOTAL AREA THIS TYPE	9,248
FIRE STATION		
	7160	12516
	TOTAL AREA THIS TYPE	12,516
TOTAL AREA SURVEYED		2,954,687

2.1.2 Lighting Controls

The lighting controls survey was performed in much the same way as the interior/exterior lighting survey. The same buildings were surveyed. The following is a listing of the additional steps required for the lighting controls survey.

1. The current method of control was identified through as-built drawings and field survey.
2. Systems Corp representatives met with Blanchfield Hospital EMCS operators to discuss the current lighting control scheme at the hospital.
3. Building surveys were performed to identify opportunities for energy saving controls.
4. Systems Corp met with the post Energy Officer throughout the survey on an as-needed basis.

2.2 CALCULATIONS

Energy calculations were performed using computerized techniques. Due to the large volume of calculations to be performed, standardized procedures were developed for the computer models. This assured consistent results and uniformity of quality in all of the calculations performed

2.2.1 Baseline Energy Consumption

The following sections will describe the method for calculating the baseline energy consumption for each of the two ECOs

2.2.1.1 Baseline Energy Consumption: ECO-1

The baseline energy consumption for this ECO was calculated using a LOTUS123 spreadsheet. This spreadsheet modeled the energy consumption of the existing lighting systems by utilizing the following:

1. Existing fixture and lamp type (i.e., fluorescent, mercury vapor, etc.)
2. Lamp wattage
3. Ballast wattage
4. Hours of use

The above information was obtained during the field survey *Table 2.2.1.1.1* lists the baseline energy consumption for the buildings surveyed for ECO-1

TABLE 2.2.1.1.1
BASELINE ENERGY CONSUMPTION
ECO-1

ECO NUMBER	BUILDING NUMBER	BASELINE ENERGY CONSUMPTION (MJ)
1	650	6,968,645
1	3211	461,732
1	3212	702,374
1	3213	489,861
1	3214	519,383
1	3215	1,021,811
1	3216	1,063,988
1	3217	593,772
1	3218	792,697
1	6709	525,223
1	6710	644,965
1	6711	321,530
1	6712	449,422
1	6718	267,404
1	6719	327,441
1	6725	297,891
1	6726	295,772
1	6727	373,547
1	6728	442,693
1	6730	438,562
1	6731	494,042
1	6732	483,056
1	6733	471,603
1	6909	418,778
1	6910	275,939
1	6911	525,156
1	6912	420,325
1	6917	599,011
1	6918	554,236
1	6919	634,674
1	6920	528,344
1	6921	448,765
1	6922	378,576
1	6923	555,798
1	6927	618,515

TABLE 2.2.1.1.1
BASELINE ENERGY CONSUMPTION
ECO-1

ECO NUMBER	BUILDING NUMBER	BASELINE ENERGY CONSUMPTION (MJ)
1	6928	551,605
1	6929	471,640
1	6930	659,472
1	6931	417,944
1	6936	381,338
1	6937	534,601
1	6938	600,961
1	6939	489,744
1	6940	549,808
1	6942	255,371
1	6943	537,138
1	6944	547,375
1	6945	450,202
1	7109	77,906
1	7110	23,176
1	7112	12,614
1	7116	35,606
1	7118	10,853
1	7120	9,280
1	7131	230,669
1	7133	169,379
1	7134	215,759
1	7141	30,989
1	7145	14,108
1	7149	148,962
1	7150	163,309
1	7152	77,246
1	7154	127,034
1	7155	42,221
1	7156	168,937
1	7157	76,286
1	7158	2,642
1	7159	59,065
1	7160	208,664
1	7163	174,858

TABLE 2.2.1.1.1
BASELINE ENERGY CONSUMPTION
ECO-1

ECO NUMBER	BUILDING NUMBER	BASELINE ENERGY CONSUMPTION (MJ)
1	7164	110,477
1	7165	34,532
1	7170	162,509
1	7176	112,867
1	7177	3,145
1	7179	95,466
1	7187	11,831
1	7206	617,305
1	7208	1,259,069
1	7210	881,474
1	7212	85,973
1	7214	1,680,339
1	7218	1,774,513
1	7243	1,810,377
1	7245	1,400,367
1	7249	1,400,367
1	7262	260,195
1	7264	169,048
1	7267	95,092
1	7268	234,593
1	7272	179,431
1	7281	196,374

2.2.1.2 Baseline Energy Consumption: ECO-2

The baseline energy consumption for this ECO was also calculated using a LOTUS123 spreadsheet. The energy consumption was modeled using field measurements and local climatological data at Fort Campbell. The baseline was calculated after implementation of any proposed retrofits under ECO-1. The purpose of this was not to eliminate over estimating the savings. The information necessary to calculate the baseline include the following

1. Existing lighting systems-type and wattage (and corresponding information on replacement system, if applicable)
2. Hours of use

The above information was obtained during the field survey. *Table 2.2.1.2.1* lists the baseline energy consumption for the buildings included in ECO-2.

2.2.2 ECO Energy Consumption

The following sections describe how the energy consumption (or energy savings) for each of the two ECOs was calculated.

2.2.2.1. ECO Energy Consumption: ECO-1

The energy consumption for this ECO was calculated in the same manner as the baseline for ECO-1. New lamp wattages, number of lamps, and ballast wattages were substituted for the existing lighting systems. For a detailed description of replacement fixtures, please refer to *Sections 3-6*

2.2.2.2 ECO Energy Consumption: ECO-2

The energy consumption for this ECO was calculated in the same manner as the baseline for ECO-2. Two control options were evaluated under this ECO, occupancy sensors and daylight sensors. The daylight sensors utilize on/off photocells to limit the use of artificial lighting when daylighting is providing the necessary light levels. The required hours to operate the lighting systems to maintain the recommended light levels were determined from the local climatological data for the Fort Campbell area. This data includes hours of heavy fog, thunderstorms, and cloudy skies during daytime hours. Revised hours of operation were substituted for the existing hours used for the baseline.

TABLE 2.2.1.2.1
BASELINE ENERGY CONSUMPTION
ECO-2

ECO NUMBER	BUILDING NUMBER	BASELINE ENERGY CONSUMPTION (MJ)
2	650	401,562
2	7152	82,128
2	7154	82,128
2	7156	92,394
2	7160	18,450
2	7206	179,856
2	7208	413,338
2	7210	150,696
2	7214	578,673
2	7218	578,673
2	7243	361,670
2	7245	210,974
2	7249	210,974
2	7262	727,834
2	7264	667,181
2	7268	363,917
2	7272	272,938

2.3 ENERGY CONSERVATION OPPORTUNITIES

The energy consumption for each of the energy conservation opportunities was prepared after the successful run of the baseline calculations. Calculation of the ECOs requires preparing a conceptual design which would allow implementation of the ECO. It is important to note that an ECO may be implemented in several ways. The designer must carefully consider the options to ensure the chosen design is the most likely to result in a savings that can justify the investment. After completing the conceptual design, the energy results were calculated by computer spreadsheets. The calculations were then reviewed for accuracy and technical feasibility. When problems were discovered, the calculations were revised and corrected.

After completing the energy calculations for each ECO, the cost estimates and economic analysis were prepared. A standardized bill of materials was prepared for each building within each ECO. Material sizes, quantities, and prices were prepared to represent specific conditions of the ECO. Annual and non-annual recurring costs are an important part of the life cycle cost for a given project. Each ECO was evaluated individually to determine the correct difference in these costs between the current condition and the future condition.

The following is a description for each ECO of how the calculations were performed in terms of the energy-efficient replacement products used.

2.3.1 ECO-1: High Efficiency Interior/Exterior Lighting

Many options were available which would fulfill this ECO. The goal was to increase the lighting efficiency of the interior and exterior lighting as much as possible while still being cost effective.

The following is a list and description of the options implemented. All options are not evaluated in all buildings due to applicability.

1. Two Foot, Four Foot, Eight Foot Fluorescent Fixtures. Replaced existing T12 lamps with T8 lamps and electronic ballasts. Reflectors were used in some fixtures to reduce the required number of lamps. Please refer to *Sections 3* through 6 for a detailed description of reflector use. Reflectors were used only in four foot fixtures. There was a one-for-one fixture replacement.

2. Incandescent Lighting: Incandescents with wattages less than 200 watts were replaced with compact fluorescents. Incandescents in office areas with wattages greater than or equal to 200 watts were replaced with a two lamp, four foot, T8 fixture. There was not a one-for-one replacement for these high wattage lamps. Incandescents in shop bays, 200 watts or greater, were replaced with high pressure sodium fixtures.

3. Exit Signs: Existing incandescent and fluorescent exit signs were replaced with LED exit signs, either through retrofit or complete sign replacement, except in the hospital where no retrofit was performed due to the type of the existing sign.

4. Mercury Vapor Fixtures: Existing mercury vapor fixtures were replaced with metal halide or high pressure sodium fixtures. Metal halide fixtures were used at all hangar facilities. Exterior mercury vapor fixtures were replaced with high pressure sodium fixtures. There was a one-for-one fixture and lumen replacement.

Please refer to *Section 3* through *6* for a detailed description of replacements utilized in each facility.

In reference to option 1 above, the decision on whether or not to use reflectors and to delamp was based on light level readings taken during the field survey and on room cavity calculations. Most areas in the barracks were significantly underlit. In these areas, fixtures with an equal number of lamps were used as replacements. Most areas in Blanchfield Hospital and in administrative facilities at the Airfield had adequate or slightly high light levels. In these areas, reflectors were used and the number of lamps reduced. *Form 2.3.1.1* shows example room cavity calculations to demonstrate existing foot candles and replacement foot candles.

In addition to savings calculated for lighting retrofits, air conditioning savings were calculated at Blanchfield Hospital. Since the hospital has year round cooling requirements, reducing the lighting load also reduces the air conditioning load. A Coefficient of Performance (COP) of 3.0 for the cooling equipment was assumed. This value was used along with the reduced lighting wattage to calculate the air conditioning savings.

2.3.2 ECO-2: Lighting Controls

Two types of controls were evaluated under this ECO: daylight sensors and occupancy sensors. For daylight sensors, the objective was to reduce the hours required for operating the lighting systems while maintaining required light levels. The use of these sensors was evaluated in hangar bays at the Airfield which receive significant daylighting through highbay doors for at least six months throughout the year. The daylight sensors work through on/off photocell control. Based on the light readings obtained during the field survey, a quantity of fixtures were identified that could be controlled by photocells. If a photocell indicates that the recommended light level is being achieved by the use of daylight, the light fixtures controlled by the photocell will turn off automatically. The sensor has a footcandle range of 50 to 500 footcandles, which is adjustable. The sensor will be set by the user at the desired footcandle reading. When the light level reaches the set footcandle level (due to daylight) and remains there for 15 minutes, the fixtures controlled by that sensor will turn off automatically. When the light level decreases to approximately 15% less than this setting and remains there for 15 minutes, the fixtures will be turned on. The time delay is built in to prevent

FORM 2.3.1.1

SIMPLIFIED LIGHTING DESIGN CALCULATION

2 X 4 RECESSED , FLUORESCENT FIXTURES : T-12, 34 W LAMPS/MAGNETIC BALLAST

Fixture	Lumens Output Per Luminaire	Input Wattage Per Luminaire
1-Lamp	2332	41
2-Lamp	4664	82
3-Lamp	6996	123
4-Lamp	9328	164

Maintained FC = (rated output lumens/luminaire) x CU x LLF / area/luminaire

Calculation based on large space, RCR 1.0 — Light loss factor LLF 0.75

Room surface reflectance: 80 50 20 — Coefficient of Utilization CU 0.67

Fixture Spacing	Area/Luminaire	Illuminance and Energy Consumed							
		1-Lamp		2-Lamp		3-Lamp		4-Lamp	
Crossover x Longitudinal	sf	fc	watts/sf	fc	watts/sf	fc	watts/sf	fc	watts/sf
4x4	48	24	0.85	49	1.71	73	2.56	98	3.42
6x4	60	18	0.64	37	1.28	55	1.92	73	2.56
6x6	90	15	0.51	29	1.03	44	1.54	59	2.05
8x6	96	12	0.43	24	0.85	37	1.28	49	1.71
8x8	128	10	0.34	20	0.68	29	1.03	39	1.37
10x8	144	8	0.28	16	0.57	24	0.85	33	1.14
12x8	168	7	0.24	14	0.49	21	0.73	28	0.98
10x10	160	7	0.24	14	0.49	21	0.73	28	0.98

For spaces with room cavity ratio (RCR) other than 1.0, use the following multiplying factors (F):

RCR=2 : F=0.83, RCR=3 : F=0.79, RCR=4 F=0.70, RCR=5 : F=0.64, RCR=6 F=0.58, RCR=7 : F=0.53, RCR=8 , F=0.48, RCR>9 F=0.45, RCR=10 , F=0.40

$$RCR = \frac{5 \times Hrc \times (Lenght + Width)}{Lenght \times Width}$$ Where Hrc = vertical distance from the fixture to work plane

Multiplying Factor for Reflector = 1.2

Example: Hospital operation contains 1 x 4 recessed fluorescent fixture 2 34w lamps/magnetic ballasts, no reflector

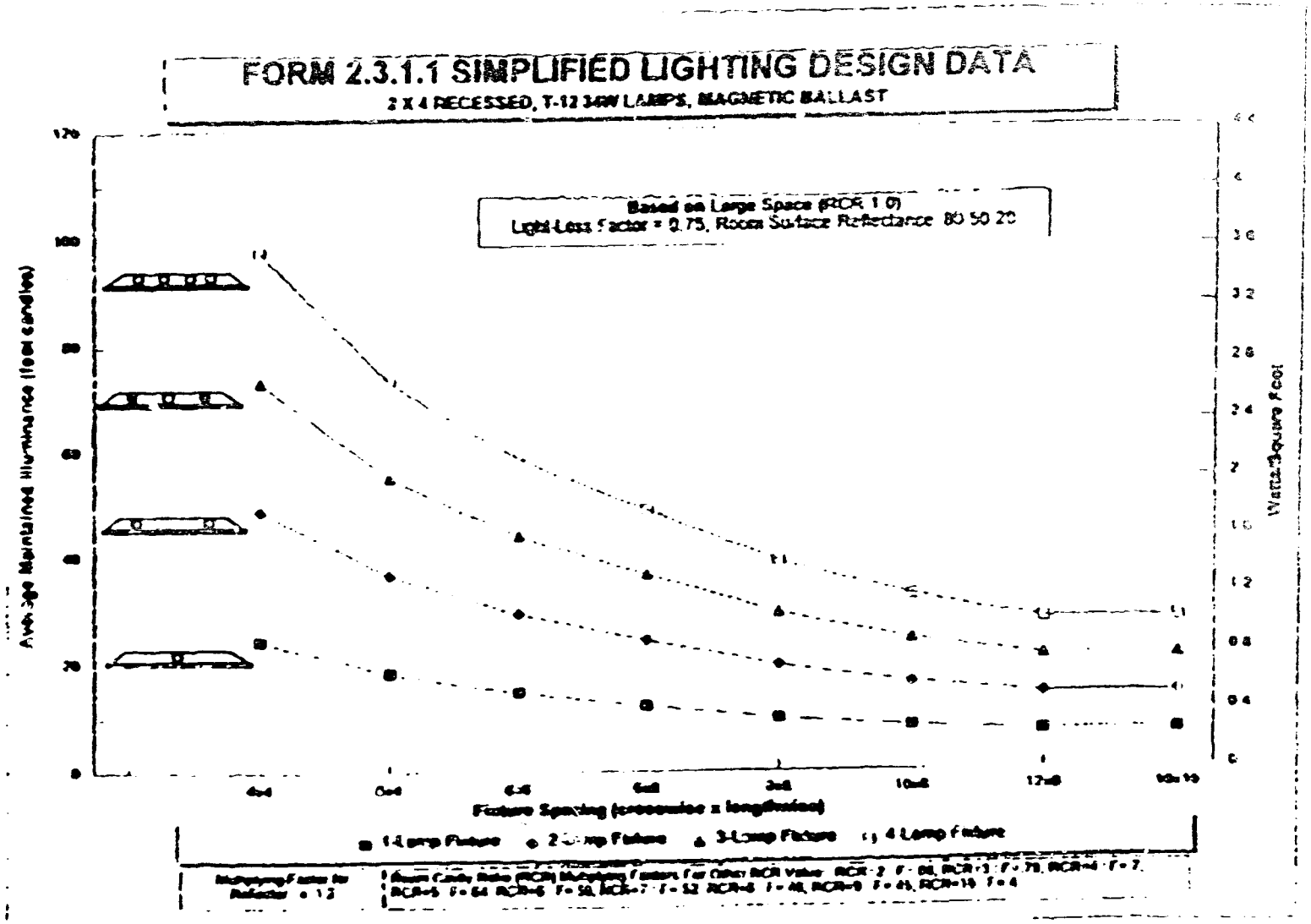
RCR = 5 x 0.5 x (8 + 8)/(8 x 8) = 9.5 (coefficient of utilization needs to be adjusted)

Initial Luminaire = 35 x 80/1 = 48

Given Value (2-lamp fixture) = 48 fc

Adjustment Factors: x 0.45 for RCR = 9.5

Adjusted Illuminance Maintained = 22 fc


FORM 2.3.1.1 SIMPLIFIED LIGHTING DESIGN DATA
2 X 4 RECESSED, T-12 34W LAMPS, MAGNETIC BALLAST
Based on Large Space (RCR 1.0)
Light Loss Factor = 0.75, Room Surface Reflectance 80 50 20
Watts/Square Foot
Fixture Spacing (crosswise x lengthwise)
1-Lamp Fixture
2-Lamp Fixture
3-Lamp Fixture
4 Lamp Fixture

FORM 2.3.1.1

SIMPLIFIED LIGHTING DESIGN CALCULATION
2 X 4 RECESSED , FLUORESCENT FIXTURES : T-8 32W LAMPS/ELECTRONIC BALLAST

Fixture	Lumens Output Per Luminaire	Input Wattage Per Luminaire
1-Lamp	2552	29
2-Lamp	5104	58
3-Lamp	7656	87
4-Lamp	to208	116

Maintained FC = (rated output lumens/luminaire) x CU x LLF / area/luminaire

Calculation based on large space RCR 1 8 Light-loss factor LLF 0 75
Room surface reflectance 80-50-20 Coefficients of Utilization CU 0 67

Illuminance and Energy Consumed

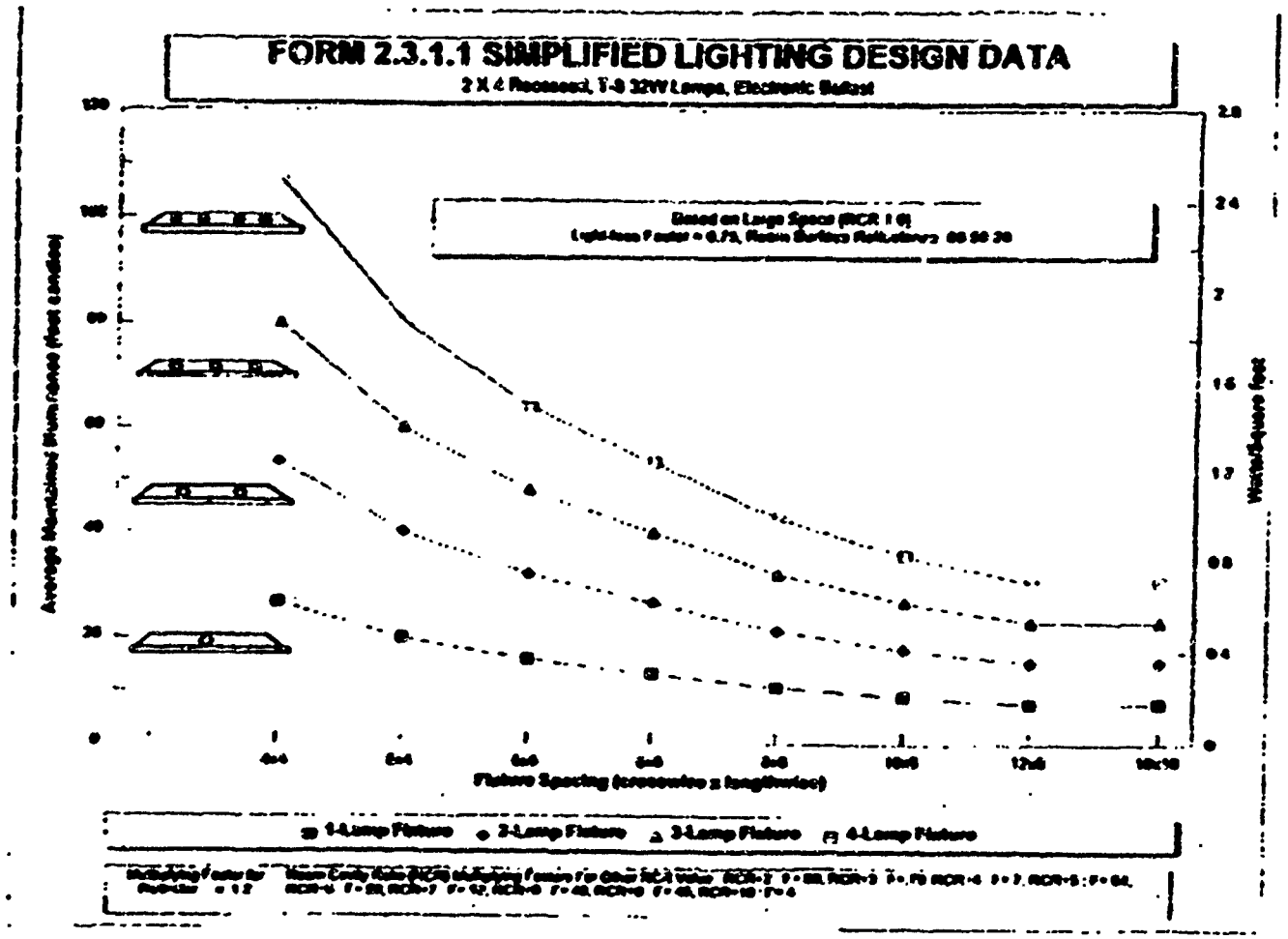
Fixture Spacing	Area/Luminaire	1-Lamp		2-Lamp		3-Lamp		4-Lamp	
Crosswise x Lengthwise	sf	fc	watts/sf	fc	watts/sf	fc	watts/sf	fc	watts/sf
4x4	16	27	0 60	53	1 21	80	1.81	107	2 42
5x4	64	20	0 45	40	0 91	60	1 36	80	1 81
6x6	80	16	0 36	32	0 73	48	1 09	64	1 45
6x8	96	13	0 30	27	0 60	40	0 91	53	1.21
8x8	120	11	0.24	21	0.48	32	0 73	43	0 97
10x8	144	9	0 20	18	0 40	27	0 60	36	0 81
12x8	168	8	0.17	15	0 35	23	0 52	31	0 69
10x10	168	8	0.17	15	0 35	23	0 52	31	0 69

For space with room cavity ratio (RCR) other than 1 8, use the following multiplying factors (F)
RCR=2 : F=0 88, RCR=3 : F=0.79, RCR=4 . F=0 78, RCR=5 : F=0 64, RCR=6 F=0 58, RCR=7 F=0 52, RCR=8 F=0 48, RCR=9 F=0.45, RCR=10 F=0 4

$$RCR = \frac{5 \times Hhc \times (Length + Width)}{Length \times Width}$$ Where Hhc = vertical distance from the fixture to work plane

Multiplying Factor For Reflector = 1 2

Example: Hospital operator contains 9 x 4 recessed fluorescent fixture 4-lamp/electronic ballast, and reflector
RCR = 5 x 6 5 x (8 + 8)/(8 x 8) = 9 5 (coefficient of utilization needs to be adjusted)
Area/Luminaire = 36 x 8/1 = 48
Base Value (1-lamp fixture) = 27 fc
Adjustment Factors X 1 2 for reflector - and - x 0 45 for RCR = 9 5
Adjusted Illuminance Maintained = 15 fc


FORM 2.3.1.1 SIMPLIFIED LIGHTING DESIGN DATA
2 X 4 Recessed, T-8 32W Lamps, Electronic Ballast
Based on Large Space (RCR 1-9)
Average Maintained Illumination (foot candles)
Watts/square foot
Fixture Spacing (crosswise x lengthwise)
1-Lamp Fixture
2-Lamp Fixture
3-Lamp Fixture
4-Lamp Fixture

the fixtures from turning off and on too frequently. Information on recommended buildings to utilize these sensors is found in *Section 4*, including a sketch of the building's bay floor plan indicating fixtures and proposed locations for photocell sensors

For occupancy sensors, the ECO objective was to save energy by turning off lights when designated areas are unoccupied. These were evaluated for use in Blanchfield Hospital, Building C. Occupancy sensors will be installed to replace the wall switches to shut lights off automatically during day and evening hours in exam rooms and staff offices

2.4 ECO LIFE CYCLE COSTS

The life cycle cost analyses for the ECOs are a combination of energy costs, investment costs, maintenance costs, and replacement costs Each of these components may, or may not, be significant factors in determining the life cycle cost of the project. Each of these cost components has been evaluated for each ECO calculated in order to determine the contribution, if any, to the life cycle cost of the project.

The life cycle costs were calculated using the computer program Life Cycle Costing in Design (LCCID) as required in the Scope of Work

2.4.1 Energy Costs - Electricity

Energy costs for each type of fuel used in the facilities included in the Scope of Work were obtained from the installation and through the Defense Energy Information System (DEIS) The costs were obtained along with the amount of energy used for FY93 Average energy costs per unit of electricity were calculated. Electricity is the only source of energy related to the study.

The electric energy consumption, demand and costs for FY93 are shown in *Table 2.4.1.1 Fort Campbell Electric*. *Figure 2.4.1.1* is a bar graph of the monthly consumption and cost The electric cost to calculate the electric cost savings for this project are as follows:

COST/kWh	= $ 0.02114/kWh	(No demand)
COST/MBtu	= $ 6.18/MBtu	(No demand)
COST/kW	= $ 11.78/kW	(Monthly demand)

2.4.2 Maintenance and Replacement Costs

The maintenance and operating cost savings for each ECO were calculated, where applicable First considered was whether or not the annual recurring (maintenance and operations) non-energy costs

Table 2.4.1.1

Fort Campbell Electric

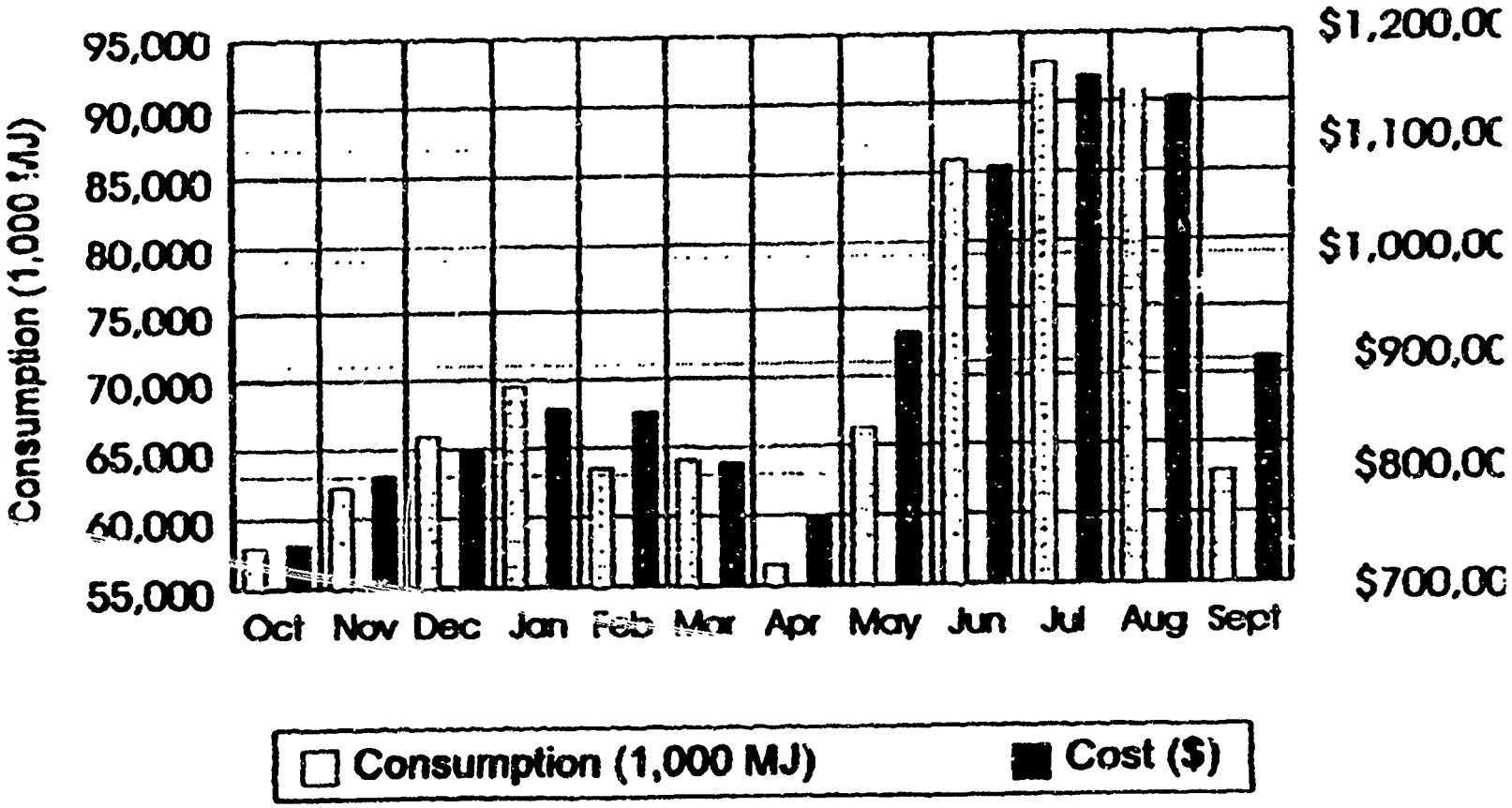
FY93

Month	Demand (KW)	Consumption (KWH)	Total Cost	Cost/KWH
Oct '92	31,072	16,077,600	$739,346	$0.046
Nov	34,020	17,287,200	$800,806	$0.046
Dec	33,907	18,320,400	$821,704	$0.045
Jan '93	35,381	19,307,400	$880,667	$0.046
Feb	38,140	17,644,200	$857,977	$0.049
Mar	33,944	17,806,000	$811,111	$0.046
Apr	34,663	15,691,200	$760,262	$0.048
May	43,697	18,429,600	$926,917	$0.050
Jun	47,212	23,872,800	$1,081,048	$0.045
Jul	50,009	25,800,600	$1,160,394	$0.045
Aug	49,556	25,229,400	$1,141,714	$0.045
Sep	43,281	17,488,800	$902,293	$0.052
TOTAL	*474,882*	*232,957,200*	*$10,864,239*	*$0.047*
Min	31,072	15,691,200	$739,346	$0.045
Max	50,009	25,800,600	$1,160,394	$0.052
Avg	39,574	19,413,100	$905,353	$0.047

Figure 2.4.1.1

Fort Campbell Electric

FY93



would significantly change as a result of each ECO. These values are sometimes unjustifiably manipulated to produce the desired results for the project economic analysis. Therefore, it was typically assumed maintenance and operation activities will continue at the same rate as before the project. However, readily identifiable differences, such as increased lamp life for fluorescent lamps as compared to incandescent lamps, have been included. The estimated costs were obtained from the Means Facilities Costs Data, 1994. Other sources included local service companies and Systems Corp developed data.

The replacement costs (non-energy non-annual recurring costs) for each ECO have been evaluated in the same manner as non-energy annual recurring costs. The same sources for cost data were used for estimating these costs also. Some examples of these types of cost items are as follows

- lamp replacements
- replacing ballasts

It is the policy of Systems Corp to be conservative when estimating these more subjective cost components--which, if improperly evaluated, could result in inappropriate project qualification and funding decisions.

Table 2.4.2.1 shows the maintenance and replacements costs used in the analysis for the different fixture types. At the bottom of this table, the method used to calculate the maintenance savings/cost is illustrated. The calculations for all maintenance savings are included in *Section 10* of this report. The maintenance savings are shown only for the buildings included in the final report, not for buildings which were eliminated from the projects due to poor economics. To be more conservative in this evaluation, no maintenance savings were calculated for ECO-2, Lighting Controls. Part of the calculations were performed manually, while part were performed using a computerized spreadsheet. The spreadsheet calculations are for the barracks, which had only two types of fixtures. The Airfield had multiple fixture types, so the spreadsheet calculations were not practical

TABLE 2.4.2.1
MAINTENANCE AND REPLACEMENT COSTS

PRODUCT DESCRIPTION	PRODUCT LIFE (HRS)	MATERIAL & LABOR COSTS
INCANDESCENT < 100 WATTS	750	$3.50
INCANDESCENT 100-300 WATTS	750	$5.25
INCANDESCENT > 300 WATTS	1,000	$26.00
QUARTZ - 200 WATTS	2,000	$32.50
4 FT FLUORESCENT TUBE	20,000	$5.00
FLUORESCENT EXIT SIGN	20,000	$8.00
COMPACT FLUORESCENT	20,000	$18.00
MERCURY VAPOR - 250 WATTS	12,000	$50.00
MERCURY VAPOR - 400 WATTS	16,000	$50.00
MERCURY VAPOR - 1000 WATTS	24,000	$70.00
METAL HALIDE - 250 WATTS	10,000	$41.00
METAL HALIDE - 400 WATTS	20,000	$47.00
HIGH PRESSURE SODIUM - 50 WATTS	24,000	$25.00
HIGH PRESSURE SODIUM - 150 WATTS	24,000	$38.00

SAMPLE CALCULATION

EXISTING MAINTENANCE COSTS
OF LAMPS X HRS OF OPERATION/YEAR X (1/LAMP LIFE) X MATL & LAB COSTS

PROPOSED MAINTENANCE COSTS
OF LAMPS X HRS OF OPERATION/YEAR X (1/LAMP LIFE) X MATL & LAB COSTS

MAINTENANCE SAVINGS = EXISTING MAINTENANCE COSTS - PROPOSED MAINTENANCE COSTS

FOR EACH OPTION (EXISTING OR PROPOSED) CALCULATE MAINTENACE COST FOR EACH LAMP TYPE PRESENT WITHIN BUILDING. REPLACEMENT MAY HAVE SAME MAINTENANCE AS EXISTING (EXAMPLE: T12 FLUOR REPLACED WITH T8 FLUOR WITH SAME NUMBER OF LAMPS).

3 PROJECT I: INTERIOR/EXTERIOR LIGHTING AT AIRFIELD

This section contains the Project Development Brochures and the DD 1391 Forms for Project I: Interior/Exterior Lighting at Airfield. Following the DD 1391 Forms is a project summary table, the life cycle cost analysis for the project, and the calculations and cost estimates for each building included in the report. Below is a detailed index of the information included in this section. Listed beside each building number are the high efficiency lighting replacements utilized in that building.

PDBs 3-2
DD1391 Forms 3-18
Table 3.1: Project Summary - Interior/Exterior Lighting at Airfield 3-26
Project LCCA 3-27

Bldg	Replacements Utilized*	Page
7109	T8 Fluor, HPS Exterior	3-28
7110	T8 Fluor, CF, LED Exit	3-36
7112	T8 Fluor, CF, LED Exit	3-44
7118	T8 Fluor, CF, LED Exit	3-52
7120	T8 Fluor, CF, LED Exit	3-60
7131	T8 Fluor, T8 Fluor with refl, CF	3-68
7133	T8 Fluor, T8 Fluor with refl, CF	3-75
7149	T8 Fluor, with Refl, CF, LED Exit	3-82
7154	T8 Fluor, (3-200W Incan to 1 2-lamp Fluor), CF	3-90
7155	T8 Fluor, with Refl, CF	3-98
7156	T8 Fluor, (3-200W Incan to 1 2-lamp Fluor), CF	3-105
7159	T8 Fluor, with refl, CF	3-113
7160	T8 Fluor, CF, HPS (200 W Incan to 50W HPS)	3-120
7164	T8 Fluor, with Refl, CF, LED Exit	3-129
7165	T8 Fluor,	3-137
7170	T8 Fluor, T8 Fluor with Refl, CF, LED Exit	3-144
7176	T8 Fluor, LED Exit, HPS	3-151
7179	T8 Fluor, with Refl, CF, LED Exit	3-159
7206	T8 Fluor, LED Exit, MH	3-167
7208	T8 Fluor, (405W Incan to 1 2-lamp Fluor), CF, MH	3-175
7210	T8 Fluor, CF, LED Exit, MH, HPS Exterior	3-184
7212	T8 Fluor, CF	3-194
7214	T8 Fluor, (405W Incan to 1 2-lamp Fluor), CF, LED Exit, MH	3-201
7218	T8 Fluor, (405W Incan to 1 2-lamp Fluor), CF, LED Exit, MH	3-211
7243	T8 Fluor, LED Exit, MH, HPS Exterior	3-221
7245	T8 Fluor, (750W Incan to 1 2-lamp Fluor), LED Exit, MH	3-230
7249	T8 Fluor, (750W Incan to 1 2-lamp Fluor), LED Exit, MH	3-239
7281	T8 Fluor, with Refl, LED Exit	3-248

Catalog Cut Sheets 3-255

*Notes:
T8 Fluor = T8 fluorescent fixture with electronic ballasts.
With Refl = above fixture with reflector used to reduce lamps
CF = Compact Fluorescent
LED Exit = exit sign replacement for incandescent or fluorescent exit sign
HPS = High Pressure Sodium fixture
MH = Metal halide
INC = Incandescent

For a more detailed description of existing fixtures and replacements, please refer to the calculation sheets for each building in this section.

facility

INTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD
Fort Campbell, Kentucky

project coordinator for using service

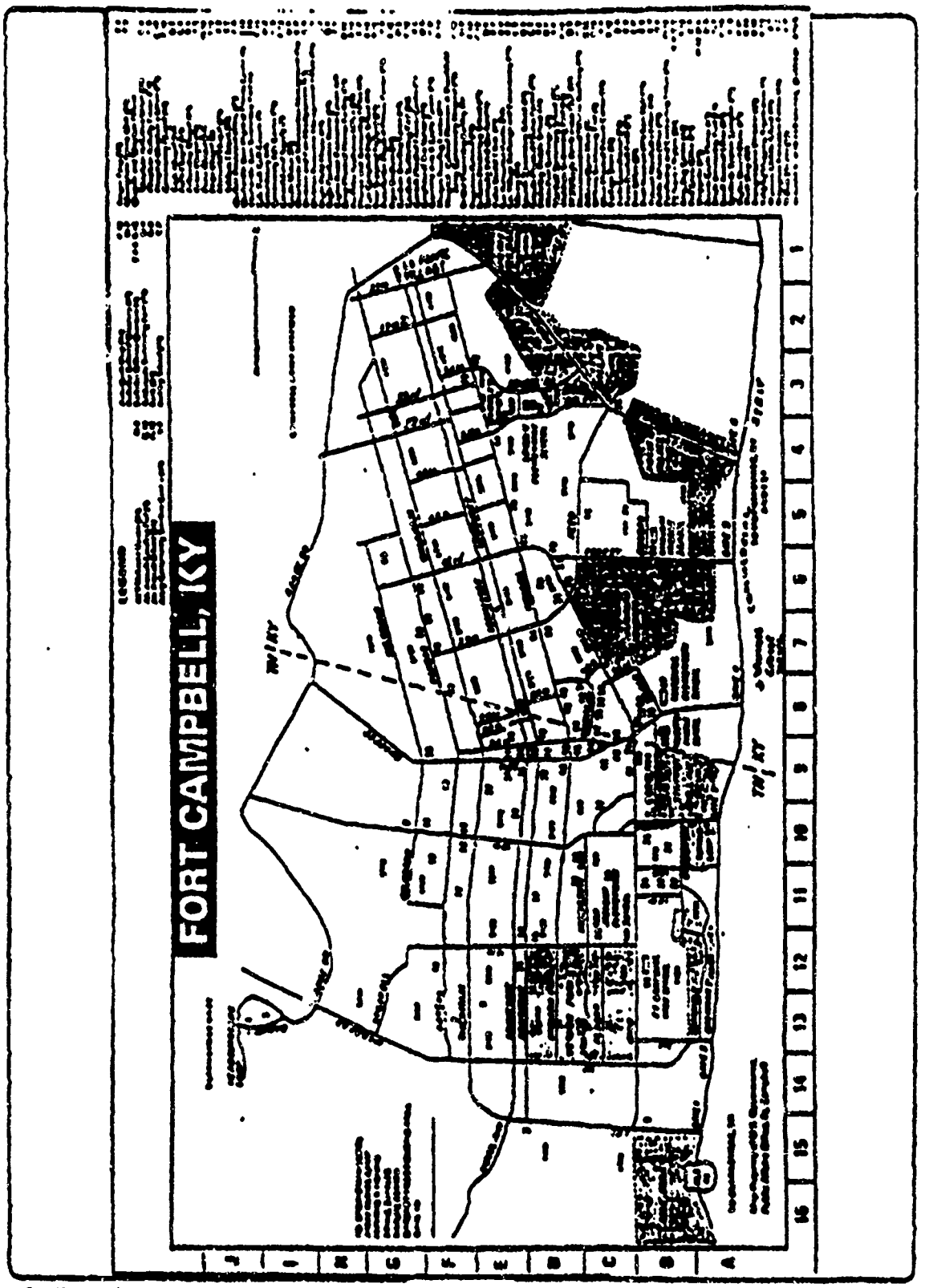
Arlin Wright

functional requirements summary, PDB-1 | 3-2

OBJECTIVE:

The objective of this project is to replace existing interior and exterior lighting with high efficiency fixtures and lamps at Campbell Army Airfield. The replacement of the existing lighting will reduce energy consumption and life cycle operating costs for the Airfield in accordance with the Army Energy Resources Management Plan (ERMP) and Executive Order 12759.

functional requirements summary, PDB-1 3-3



facilities requirements sketch, PDB- ½ | 3-4

DA FORM 5022-R, Feb 82

APPENDIX C
DOCUMENTATION CHECKLIST

A. SPECIAL CONSIDERATIONS

	ITEM	ATTACHED	* SOURCE	PREVIOUS SUBMITTED	REQUIRED SUBMITTED
A-1	Cost estimates for each primary and supporting facility	R	C	---	-
A-2	Telecommunications system coordination with USACC and authorization for operation	NR			
A-3	Coordination with state and local governments requirements (solid waste, medical facility construction and operating permits, clean water coordination, etc.)	R	A		
A-4	Assignment of soldiers	NR			
A-5	Economic analysis of alternatives	R	D		
A-6	Approval for new starts	NR			
A-7	Interservice Depth of Interdiction (IDOI) coordination with U.S. European command and NATO-approved cost estimates and comparison (include rate of exchange used in estimates)	NR			
A-8	Impact on historic placement site survey by authorized archeologist and coordination with state historic preservation officer and advisory council on historic preservation	NR			
A-9	Exception to criteria/deficiencies	NR			
A-10	Coordination with various "user groups" affected (Project Manager, Training Aids, etc.)	R			
A-11	Identification of relocation of soldiers' privately owned vehicles (POV)	R			
A-12	Required completion date	R			
	Other Special Considerations (List and number items)				
	1. See Appendix A				

REQUIRED OR NOT REQUIRED - Not to exceed 80 characters to explain requirements. Enter "R" if item is required and is required for this project. Enter "NR" if item is required and is not required for this project.

TO BE DETERMINED - Information needed but not currently available. Enter date for information to be received.

SOURCE ATTACHED - Significant information furnished but not originated and attached.

DOCUMENT ATTACHED - Significant information is to be coming documents which is attached.

* SOURCE (Check and insert appropriate letter)

- A = DPAE
- B = Using Service
- C = Construction Service
- D = Designer
- E = Other (Check Comments Attached and explain)

documentation checklist

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DA FORM 5023-A-R, Feb 82

B. SITE DEVELOPMENT

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
B-1	Correspondence with the District Office to determine and evaluate flood plain hazards	NR			
B-2	Preparation, submission, and/or approval of the				
(A)	General Site Plan	NR			
(B)	Annotated General Site Plan	NR			
(C)	Master Site Plan	NR			
(D)	Facilities Requirements Section	R			
B-3	Preparation of				
(A)	Site Survey	NR			
(B)	Soils Information	NR			
B-4	Approval by Department of the Air Force Explosive Safety Board (DDESB) for Safety Site Plan	NR			
	Other Site Development Considerations (List and number items)				
	1. See Project Development Procedure, P35-1/2				

REQUIRED OR NOT REQUIRED - Not relevant or no information to complete. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED - Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED - Significant information, summaries or comments are attached.

DOCUMENT ATTACHED - Significant information or an existing document which is attached.

"D" Information Sheets and Input Documents Noted:

A - BOAE
B - Using Service
C - Construction Service
D - Designer
E - Other (Check Comments Attached and Original)

documentation checklist

3-7

DA FORM 5023-B-R, Feb 82

C. ARCHITECTURAL & STRUCTURAL

	ITEM	Requirements Determination	Data Determined	Comments Attached	Documents Attached
C-1	Acceptance of war trider housing programs and requirements	NR			
C-2	Evaluation of existing facilities and degree of utilization	R			
C-3	Approval for removal and relocation of existing unsafe facilities	NR			
C-4	Evaluation of off-post community facilities	NR			
C-5	Storage and maintenance facilities including outdoor weapons	NR			
C-6	Coordination hospital medical and dental facilities with Surgeon General	NR			
C-7	Coordination of aviation facilities with FAA	NR			
C-8	Coordination on traffic control and navigational aids with USACC	NR			
C-9	Tabulation of types and numbers of aircraft	NR			
C-10	Evaluation of laboratory research and development and technical maintenance facilities	NR			
C-11	Coordination checked with Chief of Chaplains	NR			
C-12	Review road network facilities by USATSA	NR			
C-13	Automatic data processing section of equipment requirement should when ADP and/or communication section not considered with related facilities	NR			
C-14	Coordinate on space facilities with U.S. Postal Service Regional Director	NR			
C-15	Laundry and dry cleaning facilities coordination with AAFES/BX	NR			
C-16	Tenant facilities coordination with organization where stag	NR			
C-17	Facilities for or exposed to explosives, toxic chemicals, or ammunition--review by DDESB (See also Item E-8)	NR			
C-18	Analysis of deficiencies	R	D		1
C-19	Consideration of alternatives	R	D		2
C-20	Determination whether addition will require provision replacement of existing portion	NR			
C-21	Acquire drawings for alterations or additions	R	C		
C-22	Availability of Standard Design or the adaptable design	NR			
	Other Architectural & Structural Items and Number Items:				

1. See Supplemental Data
   Detailed Project Justification
   Paragraphs 03.

2. See Supplemental Data
   Detailed Project Justification
   Paragraph 04.

REQUIRED DA NOT REQUIRED = Not required or not applicable at this stage. Enter "R" if item is required and is required for this project. Enter "NR" if item is considered and is not required for this project.

TO BE DETERMINED = Information needed but not available. Indicate date/source for information desired.

COMMENT ATTACHED = Significant information, comments or assumptions and attached.

DOCUMENT ATTACHED = Significant information in the form of existing documentation, plans, studies.

*BY WHOM (Check one most appropriate item)

A = DPAR
B = USACE
C = Command
D = Designer
E = Other (Check Comments Attached and explain)

documentation checklist

3-8

D. MECHANICAL, ELECTRICAL & UTILITY SYSTEMS

ITEM		Response Not Required	To Be Determined	Comment Attached	Document Attached
D-1	Fuel conservation and cost comparison analysis	R	D		
D-2	Energy requirements approval (ERA)	R	D		1
D-3	Conformance with DOD Energy Reduction requirements	R	D		
D-4	Evaluation of existing and/or proposed utility systems	R	D		
	Other Mechanical and Utility Systems (List one number item.)				
	1. See Special Requirements, Paragraph 3 (SRP-3)				

REQUIRED OR NOT REQUIRED = Not relevant or no information to be submitted. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is presumed only or not required for this project.

TO BE DETERMINED = Information needed but not currently available. See remarks for information source.

COMMENT ATTACHED = Significant information furnished or explained and attached.

DOCUMENT ATTACHED = Significant information is or an existing document is being submitted.

*BY WHOM (Check one most appropriate letter)

A = AFAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Show Comments Attached and explain)

documentation checklist

3-9

DA FORM 5023-D-R, Feb 82

E. ENVIRONMENTAL CONSIDERATIONS

		Design-Build Responsibility	Date Determined	Comments Attached	Documents Attached
E-1	Environmental impact assessment	F	5		1
E-2	EIA conclusions require Environmental Impact Statement	NR			
E-3	Determination of Radon concentration in proposed facility. Assistance to determine existence of any health, environmental or related hazard may be requested from Aberdeen Proving Ground MD 21010 the Office of the Surgeon General, ATTN: DASG HCH (Army Environmental Hygiene Agency)	AE			
E-4	Air/water pollution permit coordination with agencies and compliance with standards of federal state and local level	NR			
E-5	Corrective measures developed with Environmental Impact Statements or Assessments-list secondary and exclusive	NR			
	Other environmental considerations (list and number items):				

1. See Supplemental Data
   Detailed Project Justification
   Paragraph 05.

RECURRED OR NOT RECURRED - Use to record that information is complete. Enter "R" if item is required and is required for this project. Enter "NR" if item is mandatory and is not required for this project.

TO BE DETERMINED - Information needed but not available. Use when item must be furnished later.

COMMENT ATTACHED - Significant information summarized or explained and attached.

DOCUMENT ATTACHED - Significant information in or on existing data sheet, report or drawing.

*By whom. Check one and insert appropriate letter:

A = DPW
B = Using Service
C = Construction Service
D = Designer
E = Other. Check Comments Attached and explain.

documentation checklist

3-10

DA FORM 5623-R, Feb 82

APPENDIX D
TECHNICAL DATA CHECKLIST

A. SPECIAL CONSIDERATIONS

	"SN"				
A-1	Portion of the restriction of unique [illegible] exterior to maintain finish floor and adjacent area overlaps	XF			
A-2	Construction phasing requirements	P	C		
A-3	Functional support equipment (machinery, specialized structure and spaces) to be built in	XF			
A-4	Equipment in place and withdrawal	XP			
A-5	Other equipment and furniture (O&M A DPA; and cost)	XP			
A-6	Special studies and tests (hazard analysis, combat damage testing, new technology testing etc.)	XP			
A-7	Type of construction (permanent, temporary, semi-permanent)	XP			
A-8	Government furnished equipment (quantities, procurement time availability and special handling and storage requirements) (Long lead for procurement	XF			
	Other issues considered (list and number items)				

REQUIRED OR NOT REQUIRED - For purposes of this information to be complete, enter "R" if item is required and is required for this project; Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED - Information needed but not yet known. Indicate location. Enter code for information source.

COMMENT ATTACHED - Significant information summarized or explained and attached.

DOCUMENT ATTACHED - Significant information is in or part of a document. Mark with a circle.

"S" - WHO (Check one or more appropriate option)

A = DPAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments if required and add)

technical data checklist

3-12

DA FORM 5026-A-R, Feb 82

B. SITE DEVELOPMENT

B-1	Construction restrictions or guidelines pertaining to				
(A)	site access and preferred construction routes	R	A		
(B)	Airfield clearance, explosive standoff, working hours, safety, etc.	NR			
(C)	Facilities and/or functions of adjoining areas (structures, materials, impact)	R	A		
B-2	Real estate actions (acquisition, disposal, lease, right-of-way)	NR			
B-3	Demolition/relocation required (date)				
(A)	Special considerations due to explosives/radioactivity, chemical contamination/asbestos emissions/toxic gases	R	A	I	
(B)	Restrictions on disposal of demolished/relocated material including hazardous waste	NR			
B-4	Pavement types and requirements (including traffic surveys and MTMC coordination)	NR			
B-5	Landscape considerations				
(A)	Protection of existing vegetation	R	A		
(B)	Stockpile topsoil	NR			

Other Site Development (List and number items)

1. There is a possibility that the existing lighting may contain PCB's in the ballasts.

REQUIRED OR NOT REQUIRED = Not relevant or no information is communicated. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is relevant and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter date for information receipt.

COMMENT ATTACHED = Significant information summarized or explained and attached.

DOCUMENT ATTACHED = Significant information is or existing document made a part of

"BY WHOM" (Check and insert appropriate letter)

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E = Other (Check Comments Attached and explain)

technical data checklist

3-13

C. ARCHITECTURAL & STRUCTURAL

	ITEM	Required or Not Required	* To Be Determined	Contract Awarded	Data Received
C-1	V [illegible] requiring isolation	R	D		
C-2	Seismic zone and other design load criteria (typhoon, hurricane, earthquake loads, high or low ion potential)	NR			
C-3	Protective shelter evaluation and resistant design criteria (conventional/nuclear blast and radiation, chemical/biological)	NR			
C-4	Unusual foundation requirements (clay, pile, caisson, open foundations, mat, special treatment, permafrost areas, soil bearing)	NR			
C-5	Designation and strength of units to be accommodated	NR			
C-6	Requirements and data for special design problems	NR			
C-7	Unusual floor and roof loads (cable equipment)	NR			
C-8	Security features (arms room, vault, storage safes, doors)	NR			
	Other Architectural & Structural (List and number items)				

REQUIRED OR NOT REQUIRED = Not relevant or no information to complete. Enter "R" if item is required for this project. Enter "NR" if item is unwanted or not required for this project.

"TO BE DETERMINED" = Information needed but not currently available. Enter date for information desired.

COMMENTS ATTACHED = Significant information summarized on separate page or pages.

DOCUMENTS ATTACHED = Significant information is in or accompanying documents listed or enclosed.

*BY WHOM (Enter one lower case alphabetical letter)

A = DFAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

technical data checklist

3-14

DA FORM 5026-C-R, Feb 62

TM 5-800-3 D-9

D. MECHANICAL, ELECTRICAL, & UTILITY SYSTEMS

	ITEM				
D-1	Special mechanical requirements or considerations (cranes, hoist etc.)	NR			
D-2	Special dust usage periods and dust ceiling (cfm/sq ft)	NR			
D-3	Maintenance considerations (accessibility of equipment, compatibility with existing equipment)	R	D		
D-4	Plumbing—availability, general system type and characteristics (proposed and/or existing, incl. compressed air and gas)	NR	D		
D-5	Heating—availability, general system type and characteristics (proposed and/or existing)	NR			
D-6	Ventilating, air conditioning/refrigeration—availability, general system type and characteristics (proposed and/or existing)	R	D		
D-7	Electrical—availability, general system type and characteristics (incl. existing lighting, communication, etc. (proposed and/or existing)	NR			
D-8	Water supply/waste treatment—availability, general system type and characteristics (proposed and/or existing)	NR			
D-9	Energy requirements/fuel conservation (sources, availability, heads, types of fuel etc.)	R	D		
D-10	Solar energy evaluation	NR			
	Other Mechanical & Utility Systems (List and number items)				

REQUIRED OR NOT REQUIRED – Add requested or required information or to comments. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED – Significant information summarized or explained and attached.

DOCUMENT ATTACHED – Significant information (i.e. an existing document which is attached.

* BY WHOM (Check one or more appropriate letter)

A = A/E
F = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

technical data checklist

3-15

DA FORM 5C24-D-R, Feb 82

F. FIRE PROTECTION

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
F-1	Special fire protection systems or features (detection and suppression equipment, hazards, etc.)	NR			
	Other Fire Protection Considerations (List and number items)				

REQUIRED OR NOT REQUIRED = Not relevant or no information to communicate. Enter "R" if item is relevant and is required for the project. Enter "NR" if item is relevant and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED = Significant information summarized or explained and attached.

DOCUMENT ATTACHED = Significant information is in an existing document which is enclosed.

BY WHOM (Check and insert appropriate letter)

A = Base
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comment Attached and explain)

technical data checklist

3-16

DA FORM 5024-F-R, Feb 82

1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 September 94

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Fort Campbell, Kentucky	Interior/Exterior Lighting Replacement at Army Airfield

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
		ECIP #1	3/00.80

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Primary Facility				
Interior and Exterior Light Fixtures	Lot	1	611.70	611.70
Subtotal				611.70
Contingency (10%)				61.20
Total Contract Cost				672.90
Supervision, Inspection and Overhead (5.5%)				37.00
Total Request				709.90

10. DESCRIPTION OF PROPOSED CONSTRUCTION

The existing interior/exterior lighting is a combination of standard efficiency fluorescent, incandescent, and mercury vapor fixtures. The proposed project will replace the interior and exterior lighting fixtures with T-8 fluorescents with high efficiency electronic ballasts, compact fluorescents, LED exit signs, high pressure sodium fixtures, and metal halide fixtures. The implementation of this project will save 6,880,307 MJ/yr of electrical energy. The first year savings is $130,856 and the Savings to Investment Ratio (SIR) is 2.21.

11. REQUIREMENT

Project: The proposed interior and exterior lighting project replaces lighting at Campbell Army Airfield in the following buildings with energy efficient lighting: 7109, 7110, 7112, 7118, 7120, 7131, 7133, 7149, 7154, 7155, 7156, 7159, 7160, 7164, 7165, 7170, 7176, 7179, 7206, 7208, 7210, 7212, 7214, 7218, 7243, 7245, 7249, and 7281.

Requirement: The project is required to reduce the energy consumption of lighting and to comply with the Army Energy Resources Management Plan (ERMP) and Executive Order 12759. The proposed project will reduce annual energy consumption by 6,880,307 MJ/yr and annual energy cost by $130,856..

Current Situation: The existing lighting at Campbell Army Airfield in the above listed buildings is inefficient fluorescent, incandescent, mercury vapor fixtures.

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR/EXTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD	ECIP #1

Impact if not provided: If the proposed project is not funded, a reduction of 6,880,307 MJ/yr cannot be achieved, and excessive amounts of energy will continue to be used. There will be no contribution to energy reduction goals established for United States Army facilities by Army Headquarters.

Colonel, USA
Commanding

ESTIMATED CONSTRUCTION START:	September 1995	INDEX:
ESTIMATED MIDPOINT OF CONSTRUCTION:	April 1996	INDEX:
ESTIMATED CONSTRUCTION COMPLETION:	November 1996	INDEX:

DETAILED JUSTIFICATIONS

D1. GENERAL

The proposed project encompasses the replacement of lighting at Campbell Army Airfield in 28 buildings. The project will decrease the energy consumption of the lighting system without reducing light levels except where necessary.

D2. ACCOMMODATIONS NOW IN USE:

The existing lighting systems are comprised of standard efficiency fluorescent, incandescent, and mercury vapor fixtures.

D3. ANALYSIS OF DEFICIENCY:

Currently, Campbell Army Airfield buildings 7109, 7110, 7112, 7118, 7120, 7131, 7133, 7149, 7154, 7155, 7156, 7159, 7160, 7164, 7165, 7170, 7178, 7179, 7206, 7208, 7210, 7212, 7214, 7218, 7243, 7245, 7249, and 7281 are using standard or low efficiency fixtures for lighting. The purpose of this project is to replace the existing lighting with new light fixtures which are much more efficient. The current deficiency results in large amounts of energy usage to maintain adequate lighting.

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR/EXTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD	ECIP 41

D4. CONSIDERATION OF ALTERNATIVES:

The only alternatives to proposed project are to install lower efficiency light fixtures. The disadvantages of using lower efficiency light fixtures is that less energy savings can be realized without significantly reducing the construction cost. If a less efficient light fixture is selected, the project would have a lower SIR.

D5. CRITERIA FOR PROPOSED PROJECT:

The proposed project will conform with all applicable federal and United States Army Regulations.

D6. PROGRAM FOR RELATED EQUIPMENT:

No equipment funded from appropriations other than MCA are required.

D7. DISPOSAL OF PRESENT ASSETS.

Light fixtures in the 28 buildings at Campbell Army Airfield will be disposed.

D8. SURVIVAL FACILITIES:

The proposed project is not suitable for inclusion of protective shelters.

D9. SUMMARY OF ENVIRONMENTAL CONSEQUENCES:

The proposed project has been analyzed and will not adversely impact the environment. Energy savings resulting from the project will conserve natural resources.

D10. EVALUATION OF FLOOD HAZARDS AND ENCROACHMENT ON WETLANDS:

It has been determined that these facilities are not located in a flood plain and they do not encroach on wetlands.

D11. ECONOMIC JUSTIFICATION:

The proposed project qualifies under ECIP Guidelines in AR-415-15. SIR for the project is 2.21 with a simple payback of 5.43 years.
See Economic Analysis, SRP-1

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR/EXTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD	ECIP #1

D12. UTILITY AND COMMUNICATION SUPPORT:

A. No related utility support projects are programmed. Adequate utilities are available to support the project.

B. No telecommunication support is required.

D13. PROTECTION OF HISTORIC PLACES AND ARCHEOLOGICAL SITES:

The project involves the replacement of light fixtures in and around existing buildings. Review procedures have been implemented for this project in accordance with 36 CFT 800. The review has established that there will be no effect.

D14. PROJECT DEVELOPMENT BROCHURE (PART I):

A Project Development Brochure was prepared on 23 September 94 and is attached as a part of the programming documentation.

D15. ENERGY REQUIREMENTS:

The proposed project will reduce present energy consumption by 6,880,307 MJ/yr at the cost savings of $130,656 per year. See Energy Requirements Appraisal (ERA) in Special Requirements, Paragraph 3 (SRP-3).

D16. PROVISION FOR THE HANDICAPPED:

No provisions for the handicapped will be made since the scope of the project is in no way applicable to designing for the handicapped.

D17. REAL PROPERTY MAINTENANCE ACTIVITY (RPMA) ANALYSIS:

A. Physical impact: There will be light fixtures removed and replaced by new light fixtures. No new structures will be added.

1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 September 94

3. INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	

4. PROJECT TITLE	5. PROJECT NUMBER
INTERIOR/EXTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD	ECIP #1

B. Operations and Maintenance (O&M) impact:

YEAR	O&M NET CHANGE ($000)
1994	-7.6
1995	-7.6
1996	-7.6

C. Backlog of Maintenance and Repair (BMAR) impact:

There will be a reduction in the number of fixtures and an increase in fixture life expectancy. There will be no effect on BMAR.

D18. COMMERCIAL ACTIVITIES:

The proposed project is not a "New Start Expansion" as defined by DA Circular 235-1. The project has been reviewed in light of the requirements of commercial and industrial facilities. It has been determined that whereas the project does not affect commercial facilities, the requirements of DA Circular 235-1 does not apply.

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR/EXTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD	ECIP 91

Life Cycle Cost Analysis
Project Title: Interior/Exterior Lighting Replacements
Fiscal Year: 1994
Analysis Date: 09/23/94
Economic Life Fifteen (15) Years

1 INVESTMENT

A	CONSTRUCTION COST	645,364
B	SIOH	32,268
C	DESIGN COST	32,268
D	ENERGY CREDIT CALC	-0-
E	SALVAGE VALUE	-0-
F.	TOTAL INVESTMENT	$708 900

2. ENERGY SAVINGS
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST & DISCOUNTED SAVINGS

FUEL	COST SAVING (1)	SAVINGS MBtu/YR(2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	$ 18	6521	40 300	12 43	500 928
B. DIST					
C. RESID					
D. NG					
E. DEMAND			82,741	11 85	980,481
F. TOTAL		6521	123,041		1,481 407

3. NON-ENERGY SAVINGS

A	ANNUAL RECURRING	$7615
	(1)DISCOUNT FACTOR	11 85
	(2)DISCOUNTED SAVINGS	990 238
B	NON-RECURRING SAVINGS	

ITEM	SAVINGS (+) COST(-)X1)	YEAR OF OCCURRENCE	DISCOUNT (2) FACTOR	DISCOUNTED SAVINGS(+) COST (-)X(4)
a. Replace Interior				
b. Replace Exterior				
c.				
d. Total				

C TOTAL NON ENERGY DISCOUNTED SAVINGS (+)/COST(-) 90 238

1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 September 94

3. INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	
4. PROJECT TITLE	5. PROJECT NUMBER
INTE[illegible]R/EXTERIOR LIGHTING REPLACEMENT AT ARMY AIRFIELD	ECIP #1

SPECIAL REQUIREMENTS PARAGRAPH 1 (SRP-1) (continued)

4	FIRST YEAR DOLLAR SAVINGS	$ 130,668
5	SIMPLE PAYBACK	5.43 Years
6	TOTAL NET DISCOUNTED SAVINGS	$1,517,645
7	DISCOUNTED SAVINGS RATIO	2.21

DD FORM 1391
1 DEC 77

PREVIOUS EDITIONS MAY BE USED
UNTIL EXHAUSTED

FOR OFFICIAL USE ONLY

(WHEN DATA IS ENTERED)

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	
4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR/EXTERIOR LIGHTING REPLACEMENT AT ARMY HOSPITAL	ECIP #1

SPECIAL REQUIREMENTS PARAGRAPH 3 (SRP-3):

Enemy Requirements Appraisal (ERA)

1. Project Description: Replace existing lighting systems with more efficent lighting systems without reducing the light levels

2. Estimated Energy Consumption The buildings are currently lit by standard efficiency lighting. The existing lighting system consumes 12,892,789 MJ/yr of energy Replacing the existing lighting with high efficiency lighting will result in 6,880,307 MJ/yr of electrical energy savings, a fifty-three percent (53%) reduction in current energy consumption.

3 Energy Sources: No new energy sources are required for the proposed project. The use of solar energy for this project is impractical.

4 Energy Use Impacts: The proposed project will substantially reduce the consumption of electricity for lighting. The burden on the existing base distribution system will be lessened.

5 Energy Conservation: The proposed project will reduce annual energy consumption by 6,880,307 MJ/yr with annual energy cost savings of $130,656. The project complies with Army Resources Management Plan (ERMP) and Executive Order 12759.

6. Energy Alternatives: The proposed project represents the greatest possible reduction in energy consumption fifty-three percent (53%), without reducing the current lighting levels. The current levels do not exceed the levels recommended by ASHRAE.

7 Energy Effects: The proposed project provides positive environmental effects. It reduces the current energy consumption by fifty-three percent (53%), effectively reducing the consumption of non-renewable fuel sources. The degrading of environmental standards would not make more efficient energy sources available.

8 Basis of Approval: Total energy requirements and alternative fuel sources have been considered and included in this appraisal or discarded as applicable

TABLE 3.1

PROJECT SUMMARY: INTERIOR/EXTERIOR LIGHTING AT AIRFIELD

BDG NUMBER	BUILDING NUMBER	BASELINE ENERGY (MJ)	BDG ENERGY (MJ)	ENERGY SAVINGS (%)	1ST YEAR SAVINGS	LIFECYCLE COSTS	ANNUAL RECURRING	SPB (YR)	SIR	MATERIAL COSTS	LABOR COSTS	ADDITIONAL COSTS*	TOTAL COST ESTIMATE
1	7100	77,000	47,872	38	$400	$6,000	$124	0.82	1.22	$2,100	$1,677	$1,283	$4,060
1	7110	23,470	13,120	56	$360	$2,762	$173	0.35	1.73	$600	$600	$267	$2,567
1	7112	12,644	1,535	11	$212	$360	$60	3.75	3.48	$270	$300	$102	$760
1	7140	10,000	4,500	55	$267	$760	$20	3.75	3.55	$270	$300	$102	$760
1	7139	9,000	4,157	54	$162	$360	$60	4.21	2.75	$270	$300	$102	$760
1	7114	220,000	104,201	53	$1,000	$10,000	$22	9.70	1.24	$7,000	$5,220	$4,770	$16,520
1	7132	100,270	60,476	40	$2,117	$20,220	$6	9.61	1.30	$7,700	$5,700	$4,760	$18,220
1	7140	140,000	40,572	29	$2,000	$10,000	$2,[illegible]	7.50	1.80	$8,630	$6,120	$5,120	$19,850
1	7134	127,000	20,000	16	$1,200	$6,720	$[illegible]	5.22	2.27	$2,700	$2,337	$1,752	$6,790
1	7138	40,201	34,000	27	$662	$6,370	$21	7.74	1.56	$2,300	$1,500	$1,000	$4,870
1	7135	162,000	35,754	22	$4,000	$10,360	$1,770	2.70	3.10	$5,200	$3,460	$2,000	$10,660
1	7150	90,000	49,760	55	$2,000	$9,000	$70	8.57	1.30	$3,340	$3,130	$2,300	$8,770
1	7160	253,000	80,270	32	$3,543	$9,277	$1,202	2.60	3.69	$4,630	$2,800	$2,547	$9,977
1	7164	110,477	28,262	26	$1,737	$12,300	$82	7.08	1.61	$4,337	$3,794	$3,174	$12,305
1	7165	34,533	5,200	15	$273	$1,301	$0	4.41	2.76	$671	$420	$310	$1,301
1	7170	462,000	89,100	19	$7,000	$39,830	$400	7.31	1.64	$6,340	$7,120	$5,372	$20,832
1	7136	112,000	57,252	50	$1,000	$10,300	$327	6.76	1.22	$7,664	$6,600	$4,300	$18,300
1	7174	80,000	36,000	45	$1,000	$13,000	$84	9.21	1.30	$2,430	$4,200	$3,430	$13,330
1	7200	617,000	200,000	32	$2,240	$8,540	$37,007	5.78	2.00	$10,000	$11,000	$6,755	$27,027
1	7250	1,200,000	600,000	50	$11,000	$13,000	$70,000	5.77	2.20	$32,760	$21,000	$10,030	$73,000
1	7210	894,000	450,000	50	$9,000	$8,500	$61,072	7.23	1.69	$20,500	$19,010	$15,500	$61,072
1	7212	80,000	37,000	54	$1,000	$3,000	$[illegible]	0.78	1.30	$1,220	$1,407	$634	$3,030
1	7214	1,000,000	700,000	70	$13,000	$44,000	$[illegible]	4.63	1.72	$30,530	$10,752	$17,120	$58,414
1	7240	1,770,000	800,000	45	$14,000	$60,000	$[illegible]	4.88	2.50	$33,000	$21,310	$10,000	$74,000
1	7242	1,000,000	600,000	60	$17,120	$62,000	$[illegible]	2.67	3.33	$30,000	$17,470	$10,000	$62,000
1	7246	1,000,000	600,000	60	$17,120	$70,113	$[illegible]	5.82	2.87	$30,307	$22,646	$10,001	$70,113
1	7249	1,000,000	600,000	60	$17,120	$70,113	$[illegible]	5.82	2.87	$30,307	$22,646	$10,001	$70,113
1	7251	100,000	54,000	54	$1,000	$10,000	$[illegible]	6.21	1.94	$5,130	$5,001	$4,754	$14,900
TOTALS		12,000,000	6,000,000	50,000,000	$130,000	$700,000	$7,000	8.43	2.21	$300,000	$217,000	$103,000	$700,000

LIFE CYCLE COST ANALYSIS SUMMARY — STUDY: ECO1AAFT
ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) — LCCID 1.080
INSTALLATION & LOCATION: FORT CAMPBELL REGION NOS. 4 CENSUS: 3
PROJECT NO. & TITLE: ECO1AAFT INTERIOR LIGHTING - AIRFIELD TOTAL
FISCAL YEAR 94 DISCRETE PORTION NAME: LIGHTING
ANALYSIS DATE: 09-14-94. ECONOMIC LIFE 15 YEARS PREPARED BY: J. HOLLENS

1. INVESTMENT

A. CONSTRUCTION COST	$ 645364.		
B. SIOH	$ 32268.		
C. DESIGN COST	$ 32268.		
D. TOTAL COST (1A+1B+1C)	$ 709900.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	$ 0.		
F. PUBLIC UTILITY COMPANY REBATE	$ 0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)		$ 709900.	

2. ENERGY SAVINGS (+) / COST (-)
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST $/MBTU (1)	SAVINGS MBTU/YR (2)	ANNUAL $ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	$ 6.18	6521.	$ 40300.	12.43	$ 500926
B. DIST	$ .00	0.	$ 0.	13.56	$ 0
C. RESID	$ .00	0.	$ 0.	15.09	$ 0
D. NAT G	$ .00	0.	$ 0.	15.86	$ 0
E. COAL	$ .00	0.	$ 0.	13.61	$ 0.
F. LPG	$ .00	0.	$ 0.	12.64	$ 0.
M. DEMAND SAVINGS			$ 82741.	11.85	$ 980481.
N. TOTAL		6521.	$ 123041.		$ 1481407.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		$ 7615.
(1) DISCOUNT FACTOR (TABLE A)	11.85	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		$ 90238.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+)/ COST (-) (4)
d. TOTAL	$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+)/COST (-) (3A2+3Bd4)	$ 90238.
4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))	$ 120656.
5. SIMPLE PAYBACK PERIOD (1G/4)	5.43 YEA
6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C)	$ 1571645.
7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = (IF < 1 PROJECT DOES NOT QUALIFY)	2.21
8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):	8.71 %

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7109
AREA: WHITE BLDG
AREA USE:
HOURS/DAY 24
DAYS/WEEK 7

BUILDING VOLTAGE 120V

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U @	56 WATTS/FXT =	0 WATTS	0	2 LAMP U @	58 WATTS/FXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP @	48 WATTS/FXT =	0 WATTS	0	1 LAMP @	28 WATTS/FXT =	0 WATTS
16	2 LAMP @	90 WATTS/FXT =	1440 WATTS	16	2 LAMP @	56 WATTS/FXT =	928 WATTS
	3 LAMP @	144 WATTS/FXT =	0 WATTS	0	3 LAMP @	87 WATTS/FXT =	0 WATTS
	4 LAMP @	192 WATTS/FXT =	0 WATTS	0	4 LAMP @	116 WATTS/FXT =	0 WATTS
6 FOOT				6 FOOT			
	2 LAMP @	132 WATTS/FXT =	0 WATTS	0	2 LAMP @	116 WATTS/FXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	12800	KWH/YR	
	45387	MJ/YR	
BASELINE DEMAND	1.44	KW	
ECO ENERGY CONSUMPTION	8197	KWH/YR	
	29185	MJ/YR	
ECO DEMAND	0.93	KW	

NET ENERGY SAVINGS	16192 MJ/YR	NET DEMAND SAVINGS	$72 /YR
NET ENERGY SAVINGS	15.26 MBTU/YR	NET DOLLAR SAVINGS	$167 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: *FLUORESCENT FIXTURE REPLACEMENT*

BUILDING #: 7108
AREA: WHITE BLDG
AREA USE:
HOURS/DAY 12
DAYS/WEEK 5

BUILDING VOLTAGE: 120V

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	58 W/FIXT =	0 WATTS	0	2 LAMP U	58 W/FIXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP	48 W/FIXT =	0 WATTS	0	1 LAMP	29 W/FIXT =	0 WATTS
	2 LAMP	90 W/FIXT =	0 WATTS	0	2 LAMP	58 W/FIXT =	0 WATTS
	3 LAMP	144 W/FIXT =	0 WATTS	0	3 LAMP	87 W/FIXT =	0 WATTS
13	4 LAMP	180 W/FIXT =	2340 WATTS	13	4 LAMP	118 W/FIXT =	1534 WATTS
8 FOOT				8 FOOT			
	2 LAMP	132 W/FIXT =	0 WATTS	0	2 LAMP	118 W/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	73[illegible] *KWH/YR*	*ECO ENERGY CONSUMPTION*	4758 *KWH/YR*
	26383 *MJ/YR*		17239 *MJ/YR*
BASELINE DEMAND	2.34 *KW*	*ECO DEMAND*	1.53 *KW*

NET ENERGY SAVINGS	9063 MJ/YR	NET DEMAND SAVINGS	$114 /YR
NET ENERGY SAVINGS	8.58 MBTU/YR	NET DOLLAR SAVINGS	$167 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

EXTERIOR LIGHTING REPLACE

BUILDING #: 7109

AREA USE:
HOURS/YR 4400

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACEMENT FIXTURES			
INCAND ●	100	WATTS =	0 WATTS	HPS ●	46	WATTS =	0 WATTS
2 QUARTZ ●	200	WATTS =	400 WATTS	2 HPS ●	46	WATTS =	92 WATTS
MV ●	464	WATTS =	0 WATTS	0 HPS ●	100	WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	1,760 KWH 6,336 MJ	ECO ENERGY CONSUMPTION	406 KWH 1,457 MJ
BASELINE DEMAND	0.40 KW	ECO DEMAND	0.09 KW
NET ENERGY SAVINGS	4,878 MJ/YR		
NET ENERGY SAVINGS	4.62 MBTU/YR	NET DOLLAR SAVINGS	$29 /YR

Estimate:	Bldg. 7109	Date:	8 July 1994
Description:	Radar		
Project:	Lighting Study	Bid Date:	
Location:	Ft. Campbell	Job #:	
Sq. footage:		City indx:	

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES						
	Unit values	0.49	0.00	13.35	0.00	29.00 0.00	13.35
	Totals	14.07	$0	$387	$0	$0	$387
0207082540	DEMO, QUARTZ FIXTURES						
	Unit values	1.00	0.00	27.50	0.00	2.00 0.00	27.50
	Totals	2.00	$0	$55	$0	$0	$55
C02 SITEWORK		17	$0	$442	$0	$0	$442

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S							
Unit values		0.94	26.74	22.52	0.00	(qty) 0.00	Ea.	49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S							
Unit values		1.00	28.65	23.62	0.00	(qty) 0.00	Ea.	52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307001	LOW BAY, AL REFLECTOR 50W HPS							
Unit values		2.00	209.00	55.00	0.00	4.00 EA		264.00
Totals		4.00	$836	$220	$0	$0		$1,056
1661307777	L.E.D. EXIT SIGN SINGLE FACE							
Unit values		1.00	185.00	27.50	0.00	(qty) 0.00	EA	212.50
Totals		0.00	$0	$0	$0	$0		$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS							
Unit values		1.40	88.00	38.50	0.00	(qty) 0.00	EA	126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.51	84.00	41.50	0.00	(qty) 0.00	EA	125.50
Totals		0.00	$0	$0	$0	$0		$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS							
Unit values		1.60	90.00	44.00	0.00	(qty) 0.00	EA	134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS							
Unit values		1.70	94.00	47.00	0.00	(qty) 0.00	EA	141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.14	73.00	31.50	0.00	(qty) 0.00	EA	104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8							
Unit values		1.14	86.00	31.50	0.00	(qty) 0.00	EA	117.50

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				16.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	18.24	$960	$504	$0	$0	$1,464
1661309913	SUR FLUOR 2X4' W 4 32W T8				13.00 EA	
Unit values	1.51	117.00	42.50	0.00	0.00	158.50
Totals	19.63	$1,521	$540	$0	$0	$2,061
1661356041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
016	ELECTRICAL	46	$3,317	$1,264	$0	$0	$4,581
	ESTIMATE TOTAL	63	$3,317	$1,706	$0	$0	$5,023
	SALES TAX	5.00%	$166				
	MATL MARKUP	-40.00%	($1,327)				
	LABOR MARKUP	-13.40%		($229)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$2,156	$1,477	$0	$0	$3,633
	CONTINGENCY	10.00%					$363
	BOND	2.50%					$91
	PROFIT	10.00%					$363
	JOB TOTAL						$4,451

Estimate: Bldg. 7109 Date: 8 July 1994
Description: Radar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	17	$0	$442	$0	$0	$442
U16 ELECTRICAL	46	$3,317	$1,264	$0	$0	$4,581
TOTAL	63	$3,317	$1,706	$0	$0	$5,023
SALES TAX	5.00%	[illegible]				
MATL MARKUP	-40.00%	($1,327)				
LABOR MARKUP	-13.40%		($229)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$2,156	$1,477	$0	$0	$3,633
CONTINGENCY	10.00%					$363
BOND	2.50%					$91
PROFIT	10.00%					$363
JOB TOTAL						$4,451

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7119
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5

BUILDING VOLTAGE: 120V

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
8 FOOT			2 FOOT		
2 LAMP U @	86 WATTS =	0 WATTS	0 2 LAMP U @	58 WATTS =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP @	45 WATTS =	0 WATTS	0 1 LAMP @	29 WATTS =	0 WATTS
16 2 LAMP @	84 WATTS =	1344 WATTS	16 2 LAMP @	58 WATTS =	928 WATTS
3 LAMP @	144 WATTS =	0 WATTS	0 3 LAMP @	87 WATTS =	0 WATTS
4 LAMP @	192 WATTS =	0 WATTS	0 4 LAMP @	116 WATTS =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP @	100 WATTS =	0 WATTS	0 2 LAMP @	125 WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	4108 KWH/YR	ECO ENERGY CONSUMPTION	3378 KWH/YR
	17112 MJ/YR		12161 MJ/YR
BASELINE DEMAND	1.34 KW	ECO DEMAND	0.53 KW

NET ENERGY SAVINGS	5451 MJ/YR	NET DEMAND SAVINGS	$99 /YR
NET ENERGY SAVINGS	4.17 MBTU/YR	NET DOLLAR SAVINGS	$81 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

18 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7110
AREA: ENTRY WAY
LAMP USE:
HOURS/DAY 14
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

BUILDING VOLTAGE: 120V

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
4 LAMPS @	22	WATTS	208 WATTS	4 LAMPS @	13	WATTS	52 WATTS
LAMPS @	60	WATTS	0 WATTS				
LAMPS @	75	WATTS	0 WATTS	0 LAMPS @	18	WATTS	0 WATTS
LAMPS @	90	WATTS	0 WATTS	0 LAMPS @	26	WATTS	0 WATTS
LAMPS @	150	WATTS	0 WATTS				

BASELINE ENERGY CONSUMPTION 737 KWH
3726 MJ
BASELINE DEMAND 6.31 KW

ECO ENERGY CONSUMPTION 189 KWH
681 MJ
ECO DEMAND 0.85 KW

NET EME NET ENERGY SAVINGS 3044 MJ/YR
NET EME NET ENERGY SAVINGS 1.94 MBTU/YR
NET DEMAND SAVINGS $22 /YR
NET DOLLAR SAVINGS $34 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

10 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7119

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	3	# EXIT SIGNS		# EXIT SIGNS	3
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	738 KWH/YR 2836 MJ/YR	ECO ENERGY CONSUMPTION	79 KWH/YR 794 MJ/YR
BASELINE DEMAND	0.84 KW	ECO DEMAND	0.81 KW

NET ENERGY SAVINGS	2864 MJ/YR	NET DEMAND SAVINGS	$11
NET ENERGY SAVINGS	2.42 BBTU/YR	NET DOLLAR SAVINGS	$28

Estimate: Bldg. 7110 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
02C7082121	DEMO, 2x4 FLUOR FIXTURES					16.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	7.76	$0	$214	$0	$0	$214
0207082123	DEMO, INLAND FIXTURES / EXIT SIGNS					7.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	1.81	$0	$50	$0	$0	$50
U02 SITEWORK		10	$0	$264	$0	$0	$264

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
16613C2200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					3.00	EA	
Unit values		1.00	50.00	27.50	0.00	0.00		77.50
Totals		3.00	$150	$83	$0	$0		$233
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-C ACRYLIC LENS					(qty)	EA	
Unit values		1.40	88.00	38.50	0.00	0.00		126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					16.00	EA	
Unit values		1.51	84.00	41.50	0.00	0.00		125.50
Totals		24.16	$1,344	$664	$0	$0		$2,008
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X6' W 4 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.14	73.00	31.50	0.00	0.00		104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309809	SUR FLUOR 1X4' W 2 32W T8					(qty)	EA	
Unit values		1.14	86.00	31.50	0.00	0.00		117.50
Totals		0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					(qty)	EA	
Unit values		1.14	90.00	31.50	0.00	0.00		121.50

Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 4 13 W PL WALL / CEILING MOUNT				1.00	EA
Unit values	1.00	35.50	27.50	0.00	0.00	63.00
Totals	1.00	$36	$28	$0	$0	$64

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	29	$1,530	$775	$0	$0	$2,305
ESTIMATE TOTAL	39	$1,530	$1,039	$0	$0	$2,569
SALES TAX	5.00%	$77				
MATL MARKUP	-40.00%	($612)				
LABOR MARKUP	-13.40%		($139)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$995	$900	$0	$0	$1,894
CONTINGENCY	10.00%					$189
BOND	2.50%					$47
PROFIT	10.00%					$189
JOB TOTAL						$2,320

Estimate: Bldg. 7110 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	10	$0	$264	$0	$0	$264
U16 ELECTRICAL	29	$1,530	$775	$0	$0	$2,305
TOTAL	39	$1,530	$1,039	$0	$0	$2,569
SALES TAX	5.00%	$77				
MATL MARKUP	-40.00%	($612)				
LABOR MARKUP	-13.40%		($139)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$995	$900	$0	$0	$1,894
CONTINGENCY	10.00%					$189
BOND	2.50%					$47
PROFIT	10.00%					$189
JOB TOTAL						$2,320

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

15 AUGUST 1984

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7112
AREA: DAYROOMS
AREA USE:
HOURS/DAY 14
DAYS/WEEK 7

BUILDING VOLTAGE 120V

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT
0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT
0 1 LAMP @ 40 W/FIXT = 0 WATTS
4 2 LAMP @ 84 W/FIXT = 336 WATTS
0 3 LAMP @ 144 W/FIXT = 0 WATTS
0 4 LAMP @ 192 W/FIXT = 0 WATTS

8 FOOT
0 2 LAMP @ 100 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT
0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT
0 1 LAMP @ 28 W/FIXT = 0 WATTS
4 2 LAMP @ 56 W/FIXT = 232 WATTS
0 3 LAMP @ 87 W/FIXT = 0 WATTS
0 4 LAMP @ 116 W/FIXT = 0 WATTS

8 FOOT
0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION	1712 KWH/YR 6164 MJ/YR	ECO ENERGY CONSUMPTION	0 KWH/YR 0 MJ/YR
BASELINE DEMAND	0.34 KW	ECO DEMAND	0.29 KW

NET ENERGY SAVINGS	6164 MJ/YR	NET DEMAND SAVINGS	$15 /YR
NET ENERGY SAVINGS	5.84 MBTU/YR	NET DOLLAR SAVINGS	$51 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

10 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7112
AREA: DAYROOMS
LAMP USE:
HOURS/DAY 14
DAYS/WEEK 7
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 120V

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52	WATTS	0 WATTS	0 LAMPS @	13	WATTS	0 WATTS
LAMPS @	60	WATTS	0 WATTS				
LAMPS @	75	WATTS	0 WATTS	0 LAMPS @	18	WATTS	0 WATTS
LAMPS @	00	WATTS	0 WATTS	3 LAMPS @	26	WATTS	78 WATTS
3 LAMPS @	100	WATTS	300 WATTS				

BASELINE ENERGY CONSUMPTION	1529 KWH 5504 MJ	ECO ENERGY CONSUMPTION	397 KWH 1431 MJ
BASELINE DEMAND	0.39 KW	ECO DEMAND	0.08 KW

NET ENERGY SAVINGS	4073 MJ/YR	NET DEMAND SAVINGS	$31 /YR
NET ENERGY SAVINGS	3.86 MBTU/YR	NET DOLLAR SAVINGS	$55 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7112

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.76 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	1	# EXIT SIGNS		# EXIT SIGNS	1
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	263 KWH/YR	ECO ENERGY CONSUMPTION	26 KWH/YR
	946 MJ/YR		95 MJ/YR
BASELINE DEMAND	0.03 KW	ECO DEMAND	0.003 KW

NET ENERGY SAVINGS	861 MJ/YR	NET DEMAND SAVINGS	5
NET ENERGY SAVINGS	0.31 MBTU/YR	NET DOLLAR SAVINGS	59

Estimate: Bldg. 7112 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					4.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	1.94	$0	$53	$0	$0	$53
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					2.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	0.52	$0	$14	$0	$0	$14
U02 SITEWORK		3	$0	$67	$0	$0	$67

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S							
Unit values		0.94	26.74	22.52	0.00	0.00	(qty) Ea.	49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S							
Unit values		1.00	28.65	23.82	0.00	0.00	(qty) Ea.	52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE							
Unit values		1.00	50.00	27.50	0.00	1.00	EA	77.50
Totals		1.00	$50	$28	$0	$0		$78
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS							
Unit values		1.40	88.00	38.50	0.00	0.00	(qty) EA	126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.51	84.00	41.50	0.00	4.00	EA	125.50
Totals		6.04	$336	$166	$0	0.00		$502
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					$0		
Unit values		1.60	90.00	44.00	0.00	0.00	(qty) EA	134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS							
Unit values		1.70	94.00	47.00	0.00	0.00	(qty) EA	141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.14	73.00	31.50	0.00	0.00	(qty) EA	104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8							
Unit values		1.14	86.00	31.50	0.00	0.00	(qty) EA	117.50
Totals		0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR							
Unit values		1.14	90.00	31.50	0.00	0.00	(qty) EA	121.50

Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY					
Unit values	0.13	14.50	3.44	0.00	(qty) EA	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 3 26 W PL WALL / CEILING MOUNT					
Unit values	1.00	30.50	27.50	0.00	1.00 EA	58.00
Totals	1.00	$31	$28	$0	$0	$59

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	9	$417	$222	$0	$0	$639
ESTIMATE TOTAL	12	$417	$289	$0	$0	$706
SALES TAX	5.00%	$21				
MATL MARKUP	-40.00%	($167)				
LABOR MARKUP	-13.40%		($39)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$271	$250	$0	$0	$521
CONTINGENCY	10.00%					$52
BOND	2.50%					$13
PROFIT	10.00%					$52
JOB TOTAL						$639

Estimate: Bldg. 7112 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
002 SITEWORK	3	$0	$67	$0	$0	$67
016 ELECTRICAL	9	$417	$222	$0	$0	$639
TOTAL	12	$417	$289	$0	$0	$706
SALES TAX	5.00%	$21				
MATL MARKUP	-40.00%	($167)				
LABOR MARKUP	-13.40%		($39)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$271	$250	$0	$0	$521
CONTINGENCY	10.00%					$52
BOND	2.50%					$13
PROFIT	10.00%					$52
JOB TOTAL						$639

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

29 AUGUST 1984

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7190
AREA: DAYROOM
AREA USE:
HOURS/DAY 16
DAYS/WEEK 5

BUILDING VOLTAGE: 208V

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP @	58 W/FIXT =	0 WATTS	0 2 LAMP @	58 W/FIXT =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP @	49 W/FIXT =	0 WATTS	0 1 LAMP @	29 W/FIXT =	0 WATTS
4 2 LAMP @	84 W/FIXT =	336 WATTS	4 2 LAMP @	58 W/FIXT =	232 WATTS
3 LAMP @	144 W/FIXT =	0 WATTS	0 3 LAMP @	87 W/FIXT =	0 WATTS
4 LAMP @	192 W/FIXT =	0 WATTS	0 4 LAMP @	116 W/FIXT =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP @	109 W/FIXT =	0 WATTS	0 2 LAMP @	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION		1,123 KWH/YR	ECO ENERGY CONSUMPTION		0.48 KWH/YR
		4,493 MJ/YR			3,849 MJ/YR
BASELINE DEMAND		0.34 KW	ECO DEMAND		0.23 KW

NET ENERGY SAVINGS	1,343 MJ/YR	NET DEMAND SAVINGS	515 /YR
NET ENERGY SAVINGS	1.28 MBTU/YR	NET DOLLAR SAVINGS	$23 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7118
AREA: DAYROOMS
LAMP USE
HOURS/DAY: 14
DAYS/WEEK: 7
PEAK USE: 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 120V

ELECTRIC COSTS.
ENERGY CHARGE: $0.0211 PER KWH
DEMAND CHARGE: $11.76 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
1 LAMPS @	52	WATTS	0 WATTS	0 LAMPS @	13	WATTS	0 WATTS
1 LAMPS @	60	WATTS	0 WATTS				
1 LAMPS @	75	WATTS	0 WATTS	0 LAMPS @	18	WATTS	0 WATTS
1 LAMPS @	80	WATTS	0 WATTS	3 LAMPS @	26	WATTS	78 WATTS
3 LAMPS @	100	WATTS	300 WATTS				

BASELINE ENERGY CONSUMPTION	1,329 KWH 5,504 MJ	ECO ENERGY CONSUMPTION	397 KWH 1,431 MJ
BASELINE DEMAND	0.30 KW	ECO DEMAND	0.08 KW

NET ENERGY SAVINGS	4,073 MJ/YR	NET DEMAND SAVINGS	$31 /YR
NET ENERGY SAVINGS	3.86 MBTU/YR	NET DOLLAR SAVINGS	$55 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7119

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE 11.79 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	1	# EXIT SIGNS		# EXIT SIGNS	1
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	263 KWH/YR		ECO ENERGY CONSUMPTION	26	KWH/YR
	946 MJ/YR			95	MJ/YR
BASELINE DEMAND	0.03 KW		ECO DEMAND	0.003	KW

NET ENERGY SAVINGS	851 MJ/YR	NET DEMAND SAVINGS	$4
NET ENERGY SAVINGS	0.81 MBTU/YR	NET DOLLAR SAVINGS	$9

Estimate: Bldg. 7218 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					4.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	1.94	$0	$53	$0	$0	$53
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					2.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	0.52	$0	$14	$0	$0	$14
002 SITEWORK		3	$0	$67	$0	$0	$67

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty) Ea.	
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty) Ea.	
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					1.00 EA	
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	1.00	$50	$28	$0	$0	$78
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
	Unit values	1.40	68.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					4.00 EA	
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	6.04	$336	$166	$0	$0	$502
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty) EA	
	Unit values	1.14	86.00	31.50	0.00	0.00	117.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					(qty) EA	
	Unit values	1.14	90.00	31.50	0.00	0.00	121.50

Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX,3 26 W PL WALL / CEILING MOUNT				1.00 EA	
Unit values	1.00	30.50	27.50	0.00	0.00	58.00
Totals	1.00	$31	$28	$0	$0	$59

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	9	$417	$232	$0	$0	$639
ESTIMATE TOTAL	12	$417	$289	$0	$0	$706
SALES TAX	5.00%	$21				
MATL MARKUP	-40.00%	($167)				
LABOR MARKUP	-13.40%		($39)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$271	$250	$0	$0	$521
CONTINGENCY	10.00%					$52
BOND	2.50%					$13
PROFIT	10.00%					$52
JOB TOTAL						$639

Estimate: Bldg. 7118 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	3	$0	$67	$0	$0	$67
U16 ELECTRICAL	9	$417	$222	$0	$0	$639
TOTAL	12	$417	$289	$0	$0	$706
SALES TAX	5.00%	$21				
MATL MARKUP	-40.00%	($167)				
LABOR MARKUP	-13.40%		($39)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$271	$250	$0	$0	$521
CONTINGENCY	10.00%					$52
BOND	2.50%					$13
PROFIT	10.00%					$52
JOB TOTAL						$639

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7120
AREA: DAYROOMS
AREA USE:
HOURS/DAY 4
DAYS/WEEK 5

BUILDING VOLTAGE 120V

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	56 WF/FXT =	0 WATTS	0	2 LAMP U @	58 WF/FXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP @	48 WF/FXT =	0 WATTS	0	1 LAMP @	29 WF/FXT =	0 WATTS
4	2 LAMP @	84 WF/FXT =	336 WATTS	4	2 LAMP @	58 WF/FXT =	232 WATTS
	3 LAMP @	144 WF/FXT =	0 WATTS	0	3 LAMP @	87 WF/FXT =	0 WATTS
	4 LAMP @	192 WF/FXT =	0 WATTS	0	4 LAMP @	116 WF/FXT =	0 WATTS
8 FOOT				8 FOOT			
	2 LAMP @	100 WF/FXT =	0 WATTS	0	2 LAMP @	125 WF/FXT =	0 WATTS
BASELINE ENERGY CONSUMPTION			1,223 KWH/YR	ECO ENERGY CONSUMPTION			946 KWH/YR
			4,403 MJ/YR				3,049 MJ/YR
BASELINE DEMAND			0.34 KW	ECO DEMAND			0.23 KW

NET ENERGY SAVINGS	1,393 MJ/YR	NET DEMAND SAVINGS	$15 /YR
NET ENERGY SAVINGS	1.29 MBTU/YR	NET DOLLAR SAVINGS	$23 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

10 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7120
AREA: DAYROOMS
LAMP USE:
HOURS/DAY 14
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENTS

LAMPS @	52	WATTS =	0	WATTS
LAMPS @	60	WATTS =	0	WATTS
LAMPS @	75	WATTS =	0	WATTS
LAMPS @	90	WATTS =	0	WATTS
5 LAMPS @	100	WATTS =	500	WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @	13	WATTS =	0	WATTS
0 LAMPS @	18	WATTS =	0	WATTS
3 LAMPS @	26	WATTS =	78	WATTS

BASELINE ENERGY CONSUMPTION	1,692 KWH 3,931 MJ	ECO ENERGY CONSUMPTION	284 KWH 1,022 MJ
BASELINE DEMAND	0.39 KW	ECO DEMAND	0.09 KW

NET ENERGY SAVINGS	2,909 MJ/YR	NET DEMAND SAVINGS	$31 /YR
NET ENERGY SAVINGS	2.76 MBTU/YR	NET DOLLAR SAVINGS	$48 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

10 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7179

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURES	
# EXIT SIGNS	1	# EXIT SIGNS		# EXIT SIGNS	1
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	263 KWH/YR .048 MJ/YR	ECO ENERGY CONSUMPTION	39 KWH/YR .04 MJ/YR
BASELINE DEMAND	0.03 KW	ECO DEMAND	0.003 KW

NET ENERGY SAVINGS	851 MJ/YR	NET DEMAND SAVINGS	$4
NET ENERGY SAVINGS	0.81 MBTU/YR	NET DOLLAR SAVINGS	$9

Estimate: Bldg. 7120 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. Footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					4.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	1.94	$0	$53	$0	$0	$53
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					2.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	0.52	$0	$14	$0	$0	$14
C02 SITEWORK		3	$0	$67	$0	$0	$67

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S							
Unit values		0.94	26.74	22.52	0.00	(qty) 0.00	Ea.	49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302900	SUR FLUOR STRIP 4' W 2 40W LAMP R S							
Unit values		1.00	28.65	23.82	0.00	(qty) 0.00	Ea.	52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE							
Unit values		1.00	50.00	27.50	0.00	1.00	EA	77.50
Totals		1.00	$50	$28	$0	$0		$78
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS							
Unit values		1.40	88.00	38.50	0.00	(qty) 0.00	EA	126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.51	84.00	41.50	0.00	4.00	EA	125.50
Totals		6.04	$336	$166	$0	$0		$502
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS							
Unit values		1.60	90.00	44.00	0.00	(qty) 0.00	EA	134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS							
Unit values		1.70	94.00	47.00	0.00	(qty) 0.00	EA	141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.24	73.00	31.50	0.00	(qty) 0.00	EA	104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8							
Unit values		1.14	86.00	31.50	0.00	(qty) 0.00	EA	117.50
Totals		0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR							
Unit values		1.14	90.00	31.50	0.00	(qty) 0.00	EA	121.50

Job

Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUCR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty, EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUCR FIX, 3 26 W PL WALL / CEILING MOUNT				1.00 EA	
Unit values	1.00	30.50	27.50	0.00	0.00	58.00
Totals	1.00	$31	$28	$0	$0	$59

Job 6429 Fiche 1 02/04/99 06:55AM

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	9	$417	$222	$0	$0	$639
ESTIMATE TOTAL	12	$417	$289	$0	$0	$706
SALES TAX	5.00%	$21				
MATL MARKUP	-40.00%	($167)				
LABOR MARKUP	-13.40%		($39)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$271	$250	$0	$0	$521
CONTINGENCY	10.00%					$52
BOND	2.50%					$13
PROFIT	10.00%					$52
JOB TOTAL						$639

Estimate: Bldg. 7120 Date: 8 July 1994
Description: Barracks
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	3	$0	$67	$0	$0	$67
U16 ELECTRICAL	9	$417	$222	$0	$0	$639
TOTAL	12	$417	$289	$0	$0	$706
SALES TAX	5.00%	$21				
MATL MARKUP	-40.00%	($167)				
LABOR MARKUP	-13.40%		($39)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$271	$250	$0	$0	$521
CONTINGENCY	10.00%					$52
BOND	2.50%					$13
PROFIT	10.00%					$52
JOB TOTAL						$639

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUIORESCENT FIXTURE REPLACEMENT

BUILDING #: 7131
AREA: ENTIRE BLDG
AREA USE
HOURS/DAY 12
DAYS/WEEK 6

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT			
1	2 LAMP U	86 W/FIXT =	86 WATTS
4 FOOT			
	1 LAMP @	46 W/FIXT =	0 WATTS
55	2 LAMP @	94 W/FIXT =	7392 WATTS
	3 LAMP @	144 W/FIXT =	0 WATTS
57	4 LAMP @	168 W/FIXT =	9576 WATTS
8 FOOT			
	2 LAMP @	160 W/FIXT =	0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT			
1	2 LAMP U @	58 W/FIXT =	58 WATTS
4 FOOT			
0	1 LAMP @	29 W/FIXT =	0 WATTS
88	2 LAMP @	58 W/FIXT =	5104 WATTS
0	3 LAMP @	87 W/FIXT =	0 WATTS
57	2 LAMP @ W/ REFLECTOR	58 W/FIXT =	3306 WATTS
8 FOOT			
0	2 LAMP @	125 W/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	*63,088 KWH/YR*	*ECO ENERGY CONSUMPTION*	*31,784 KWH/YR*
	229,995 MJ/YR		*114,135 MJ/YR*
BASELINE DEMAND	*17.96 KW*	*ECO DEMAND*	*8.47 KW*

NET ENERGY SAVINGS	115,859 MJ/YR	NET DEMAND SAVINGS	$1,215 /YR
NET ENERGY SAVINGS	109.81 MBTU/YR	NET DOLLAR SAVINGS	$1,894 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7131
AREA: RESTROOM
LAMP USE
HOURS/DAY 4
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52	WATTS =	0 WATTS	3 LAMPS @	13	WATTS =	39 WATTS
3 LAMPS @	60	WATTS =	180 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	0 LAMPS @	26	WATTS =	0 WATTS
LAMPS @	100	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	187 KWH 674 MJ	ECO ENERGY CONSUMPTION	7 KWH 146 MJ
BASELINE DEMAND	0.18 KW	ECO DEMAND	0.04 KW

NET ENERGY SAVINGS	528 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.50 MBTU/YR	NET DOLLAR SAVINGS	$3 /YR

Estimate: Bldg. 7131 Date: 6 July 1994
Description:
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line # / Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082119 DEMO, 2x2, 1x4 FLUOR FIXTURES					1.00	
Unit values	0.36	0.00	10.00	0.00	0.00	10.0
Totals	0.36	$0	$10	$0	$0	$1
0207082121 DEMO, 2x4 FLUOR FIXTURES					145.00	
Unit values	0.49	0.00	13.35	0.00	0.00	13.3
Totals	70.32	$0	$1,936	$0	$0	$1,93
0207082123 DEMO, INCAND FIXTURES / EXIT SIGNS					3.00	
Unit values	0.26	0.00	7.10	0.00	0.00	7.1
Totals	0.77	$0	$21	$0	$0	$2
U02 SITEWORK	72	$0	$1,967	$0	$0	$1,96

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	(qty)	Ea.	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S								
Unit values		0.94	26.74	22.52	0.00		0.00		49.2
Totals		0.00	$0	$0	$0		$0		$
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S								
Unit values		1.00	28.65	23.82	0.00		0.00		52.4
Totals		0.00	$0	$0	$0		$0		$
1661307777	L.E.D. EXIT SIGN SINGLE FACE						(qty)	EA	
Unit values		1.00	185.00	27.50	0.00		0.00		212.5
Totals		0.00	$0	$0	$0		$0		$
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS						1.00	EA	
Unit values		1.40	88.00	38.50	0.00		0.00		126.5
Totals		1.40	$88	$39	$0		$0		$12
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.51	84.00	41.50	0.00		0.00		125.5
Totals		0.00	$0	$0	$0		$0		$
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.60	90.00	44.00	0.00		0.00		134.0
Totals		0.00	$0	$0	$0		$0		$
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS						0.00	EA	
Unit values		1.70	94.00	47.00	0.00		0.00		141.0
Totals		0.00	$0	$0	$0		$0		$
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR						57.00	EA	
Unit values		1.51	106.50	41.50	0.00		0.00		148.0
Totals		86.07	$6,071	$2,366	$0		$0		$8,43
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.14	73.00	31.50	0.00		0.00		104.5
Totals		0.00	$0	$0	$0		$0		$
1661309909	SUR FLUOR 1X4' W 2 32W T8						(qty)	EA	
Unit values		1.14	86.00	31.50	0.00		0.00		117.5

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				88.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	100.32	$5,280	$2,772	$0	$0	$8,052
1661328041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661328042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				3.00 EA	
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	3.00	$77	$83	$0	$0	$160

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	191	$11,516	$5,260	$0	$0	$16,776
ESTIMATE TOTAL	263	$11,516	$7,227	$0	$0	$18,743
SALES TAX	5.00%	$576				
MATL MARKUP	-40.00%	($4,606)				
LABOR MARKUP	-13.40%		($968)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,485	$6,259	$0	$0	$13,744
CONTINGENCY	10.00%					$1,374
BOND	2.50%					$344
PROFIT	10.00%					$1,374
JOB TOTAL						$16,836

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Estimate: Bldg. 7131 Date: 8 July 1994
Description:
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	72	$0	$1,967	$0	$0	$1,967
U16 ELECTRICAL	191	$11,516	$5,260	$0	$0	$16,776
TOTAL	263	$11,516	$7,227	$0	$0	$18,743
SALES TAX	5.00%	$576				
MATL MARKUP	-40.00%	($4,606)				
LABOR MARKUP	-13.40%		($968)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,485	$6,259	$0	$0	$13,744
CONTINGENCY	10.00%					$1,374
BOND	2.50%					$344
PROFIT	10.00%					$1,374
JOB TOTAL						$16,836

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7133
AREA: ENTIRE BLDG
AREA USE
HOURS/DAY 10
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
8 2 LAMP U	84 W/FIXT =	672 WATTS	8 2 LAMP U @	58 W/FIXT =	464 WATTS
4 FOOT			4 FOOT		
1 LAMP @	40 W/FIXT =	0 WATTS	0 1 LAMP @	29 W/FIXT =	0 WATTS
29 2 LAMP @	84 W/FIXT =	2436 WATTS	29 2 LAMP @	58 W/FIXT =	1682 WATTS
3 LAMP @	120 W/FIXT =	0 WATTS	0 3 LAMP @	87 W/FIXT =	0 WATTS
89 4 LAMP @	168 W/FIXT =	14952 WATTS	89 2 LAMP @ W/ REFLECTOR	58 W/FIXT =	5162 WATTS
8 FOOT			8 FOOT		
2 LAMP @	180 W/FIXT =	0 WATTS	0 2 LAMP @	125 W/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	48,346	KWH/YR	ECO ENERGY CONSUMPTION	19,881	KWH/YR
	168,842	MJ/YR		68,403	MJ/YR
BASELINE DEMAND	18.06	KW	ECO DEMAND	7.39	KW

NET ENERGY SAVINGS	100,839 MJ/YR	NET DEMAND SAVINGS	$1,529 /YR
NET ENERGY SAVINGS	95.38 MBTU/YR	NET DOLLAR SAVINGS	$2,119 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7133
AREA: RESTROOM
LAMP USE:
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS					COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52	WATTS =	0	WATTS	2 LAMPS @	13	WATTS =	26 WATTS
2 LAMPS @	60	WATTS =	120	WATTS				
LAMPS @	75	WATTS =	0	WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0	WATTS	0 LAMPS @	26	WATTS =	0 WATTS
LAMPS @	100	WATTS =	0	WATTS				

BASELINE ENERGY CONSUMPTION	94 KWH 337 MJ	ECO ENERGY CONSUMPTION	20 KWH 73 MJ
BASELINE DEMAND	0.12 KW	ECO DEMAND	0.03 KW

NET ENERGY SAVINGS	264 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.25 MBTU/YR	NET DOLLAR SAVINGS	$2 /YR

Estimate: Bldg. 7133 Date: 8 July 1994
Description: Admin
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082119	DEMO, 2x2, 1x4 FLUOR FIXTURES					8.00	
	Unit values	0.36	0.00	10.00	0.00	0.00	10.00
	Totals	2.91	$0	$80	$0	$0	$80
0207082121	DEMO, 2x4 FLUOR FIXTURES					118.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	57.23	$0	$1,575	$0	$0	$1,575
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					2.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	0.52	$0	$14	$0	$0	$14
U02 SITEWORK		61	$0	$1,669	$0	$0	$1,669

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN SINGLE FACE					(qty)	EA	
Unit values		1.00	185.00	27.50	0.00	0.00		212.50
Totals		0.00	$0	$0	$0	$0		$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					6.00	EA	
Unit values		1.40	88.00	38.50	0.00	0.00		126.50
Totals		11.23	$704	$308	$0	$0		$1,012
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.51	84.00	41.50	0.00	0.00		125.50
Totals		0.00	$0	$0	$0	$0		$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					0.00	EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR					89.00	EA	
Unit values		1.51	106.50	41.50	0.00	0.00		148.00
Totals		134.39	$9,479	$3,694	$0	$0		$13,173
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.14	73.00	31.50	0.00	0.00		104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty)	EA	
Unit values		1.14	86.00	31.50	0.00	0.00		117.50

Totals	0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 2X4' W 2 32W T8 TWO-PIECE REFLECTOR				29.00 EA		
Unit values	2.14	60.00	31.50	0.00	0.00		91.50
Totals	33.06	$2,760	$914	$0	$0		$2,654
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA		
Unit values	0.13	14.50	3.44	0.00	0.00		17.94
Totals	0.00	$0	$0	$0	$0		$0
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				2.00 EA		
Unit values	1.00	25.50	27.50	0.00	0.00		53.00
Totals	2.00	$51	$55	$0	$0		$106

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	181	$11,974	$4,971	$0	$0	$16,945
ESTIMATE TOTAL	242	$11,974	$6,640	$0	$0	$18,614
SALES TAX	5.00%	$599				
MATL MARKUP	-40.00%	($4,790)				
LABOR MARKUP	-13.40%		($890)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,783	$5,750	$0	$0	$13,533
CONTINGENCY	10.00%					$1,353
BOND	2.50%					$338
PROFIT	10.00%					$1,353
JOB TOTAL						$16,578

Estimate: Bldg. 7133 Date: 8 July 1994
Description: Admin
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U12 SITEWORK	61	$0	$1,669	$0	$0	$1,669
U16 ELECTRICAL	181	$11,974	$4,971	$0	$0	$16,945
TOTAL	242	$11,974	$6,640	$0	$0	$18,614
SALES TAX	5.00%	$599				
MATL MARKUP	-40.00%	($4,790)				
LABOR MARKUP	-13.40%		($890)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,783	$5,750	$0	$0	$13,533
CONTINGENCY	10.00%					$1,353
BOND	2.50%					$338
PROFIT	10.00%					$1,353
JOB TOTAL						$16,578

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7149
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 8
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	96 W/FIXT =	0 WATTS	0	2 LAMP U	58 W/FIXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP	48 W/FIXT =	0 WATTS	0	1 LAMP	29 W/FIXT =	0 WATTS
31	2 LAMP	84 W/FIXT =	2604 WATTS	31	1 LAMP W/REFLECTOR	29 W/FIXT =	899 WATTS
	3 LAMP	144 W/FIXT =	0 WATTS	0	3 LAMP	87 W/FIXT =	0 WATTS
98	4 LAMP	168 W/FIXT =	16464 WATTS	98	2 LAMP W/REFLECTOR	58 W/FIXT =	5684 WATTS
8 FOOT				8 FOOT			
	2 LAMP	250 W/FIXT =	0 WATTS	0	2 LAMP	125 W/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	36,861 KWH/YR 142,791 MJ/YR	ECO ENERGY CONSUMPTION	13,693 KWH/YR 49,294 MJ/YR
BASELINE DEMAND	19.87 KW	ECO DEMAND	6.59 KW

NET ENERGY SAVINGS	93,498 MJ/YR	NET DEMAND SAVINGS	$1,765 /YR
NET ENERGY SAVINGS	88.61 MBTU/YR	NET DOLLAR SAVINGS	$2,313 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7149
AREA: RESTROOMS
LAMP USE
HOURS/DAY ___ 3
DAYS/WEEK ___ 5
PEAK USE ___2 (1 YES, 2 NO)

BUILDING VOLTAG 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52	WATTS =	0 WATTS	3 LAMPS @	13	WATTS =	39 WATTS
3 LAMPS @	60	WATTS =	180 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	0 LAMPS @	26	WATTS =	0 WATTS
LAMPS @	100	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	149 KWH 396 MJ	ECO ENERGY CONSUMPTION	39 KWH 119 MJ
BASELINE DEMAND	0.18 KW	ECO DEMAND	0.04 KW

NET ENERGY SAVINGS	396 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.38 MBTU/YR	NET DOLLAR SAVINGS	$2 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7148

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	6	# EXIT SIGNS		# EXIT SIGNS	6
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	1,577 KWH/YR 5,378 MJ/YR	ECO ENERGY CONSUMPTION	158 KWH/YR 568 MJ/YR
BASELINE DEMAND	0.18 KW	ECO DEMAND	0.02 KW

NET ENERGY SAVINGS	5,199 MJ/YR	NET DEMAND SAVINGS	$23 /YR
NET ENERGY SAVINGS	4.84 MBTU/YR	NET DOLLAR SAVINGS	$63 /YR

Estimate: Bldg. 7149 Date: 8 July 1994
Description: Clinic
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					129.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	62.57	$0	$1,722	$0	$0	$1,722
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					9.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	2.32	$0	$64	$0	$0	$64
U02 SITEWORK		65	$0	$1,786	$0	$0	$1,786

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty) Ea.	
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty) Ea.	
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					6.00 EA	
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	6.00	$300	$165	$0	$0	$465
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					0.00 EA	
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR					98.00 EA	
	Unit values	1.51	106.50	41.50	0.00	0.00	148.00
	Totals	147.98	$10,437	$4,067	$0	$0	$14,504
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					0.00 EA	
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 1 32W T8 ACRYLIC LENS/W REFLECTOR					31.00 EA	
	Unit values	1.14	80.00	33.50	0.00	0.00	113.50

Totals	35.34	$2,420	$977	$0	$0	$3,457
1661309909	SUR FLUOR 1X4' W 2 32W T8					
					(qty)	EA
Unit values	1.14	86.00	31.50	0.00	0.00	117.50
Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					
					(qty)	EA
Unit values	1.14	90.00	31.50	0.00	0.00	121.50
Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY					
					(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 1 13 W PL WALL / CEILING MOUNT					
					3.00	EA
Unit values	1.00	20.50	27.50	0.00	0.00	48.00
Totals	3.00	$62	$83	$0	$0	$145

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	193	$13,279	$5,292	$0	$0	$18,571
ESTIMATE TOTAL	258	$13,279	$7,078	$0	$0	$20,357
SALES TAX	5.00%	$664				
MATL MARKUP	-40.00%	($5,312)				
LABOR MARKUP	-13.40%		($948)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$8,631	$6,130	$0	$0	$14,761
CONTINGENCY	10.00%					$1,476
BOND	2.50%					$369
PROFIT	10.00%					$1,476
JOB TOTAL						$18,082

Estimate: Bldg. 7149 Date: 8 July 1994
Description: Clinic
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	65	$0	$1,786	$0	$0	$1,756
U16 ELECTRICAL	193	$13,279	$5,292	$0	$0	$18,571
TOTAL	258	$13,279	$7,078	$0	$0	$20,357
SALES TAX	5.00%	$664				
MATL MARKUP	-40.00%	($5,312)				
LABOR MARKUP	-13.40%		($948)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$8,631	$6,130	$0	$0	$14,761
CONTINGENCY	10.00%					$1,476
BOND	2.50%					$369
PROFIT	10.00%					$1,476
JOB TOTAL						$18,082

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7154
AREA: OFFICE AREAS
AREA USE
HOURS/DAY 8
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 2 LAMP U	56 WATTS	0 WATTS	0 2 LAMP U	58 WATTS	0 WATTS
4 FOOT			4 FOOT		
1 1 LAMP	48 WATTS	0 WATTS	0 1 LAMP	28 WATTS	0 WATTS
27 2 LAMP	84 WATTS	2268 WATTS	27 2 LAMP	58 WATTS	1566 WATTS
3 3 LAMP	114 WATTS	0 WATTS	0 3 LAMP	87 WATTS	0 WATTS
4 4 LAMP	168 WATTS	672 WATTS	4 4 LAMP	116 WATTS	472 WATTS
8 FOOT			8 FOOT		
2 2 LAMP	160 WATTS	0 WATTS	0 3 LAMP	125 WATTS	0 WATTS
BASELINE ENERGY CONSUMPTION		6,195 KWH/YR	ECO ENERGY CONSUMPTION		4,239 KWH/YR
		22,015 MJ/YR			15,261 MJ/YR
BASELINE DEMAND		3.84 KW	ECO DEMAND		2.84 KW

NET ENERGY SAVINGS	6,764 MJ/YR	NET DEMAND SAVINGS	$123 /YR
NET ENERGY SAVINGS	6.40 MBTU/YR	NET DOLLAR SAVINGS	$167 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7151
AREA: OFFICE/SHOP AREAS
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS
69 LAMPS @ 200 WATTS = 13800 WATTS

FLUORESCENT FIXTURE REPLACEMENT - 4 FOOT
23.2 LAMP @ 58 WATT = 1334 WATTS

BASELINE ENERGY CONSUMPTION	28,704 KWH 103,334 MJ	ECO ENERGY CONSUMPTION	2,775 KWH 9,989 MJ
BASELINE DEMAND	13.80 KW	ECO DEMAND	1.33 KW

NET ENERGY SAVINGS	93,346 MJ/YR	NET DEMAND SAVINGS	$1,762 /YR
NET ENERGY SAVINGS	88.47 MBTU/YR	NET DOLLAR SAVINGS	$2,399 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7154
AREA: RESTROOM
LAMP USE:
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTA 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENT				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	60	WATTS =	0 WATTS	0 LAMPS @	13	WATTS =	0 WATTS
LAMPS @	60	WATTS =	0 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	3 LAMPS @	26	WATTS =	78 WATTS
3 LAMPS @	300	WATTS =	900 WATTS				

BASELINE ENERGY CONSUMPTION	900 KWH	ECO ENERGY CONSUMPTION	67 KWH
	1,906 MJ		249 MJ
BASELINE DEMAND	2.99 KW	ECO DEMAND	0.00 KW

NET ENERGY SAVINGS	1,406 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	1.33 MBTU/YR	NET DOLLAR SAVINGS	$9 /YR

Estimate: Bldg. 7154 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					31.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.3
	Totals	15.04	$0	$414	$0	$0	$41
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					72.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.1
	Totals	18.58	$0	$511	$0	$0	$51
002 SITEWORK		34	$0	$925	$0	$0	$92

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S							
Unit values		0.94	26.74	22.52	0.00	(qty) 0.00	Ea.	49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S							
Unit values		1.00	28.65	23.82	0.00	(qty) 0.00	Ea.	52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307001	LOW BAY, AL REFLECTOR 50W HPS							
Unit values		2.00	209.00	55.00	0.00	0.00	EA	264.00
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN SINGLE FACE							
Unit values		1.00	185.00	27.50	0.00	(qty) 0.00	EA	212.50
Totals		0.00	$0	$0	$0	$0		$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS							
Unit values		1.40	88.00	38.50	0.00	(qty) 0.00	EA	126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.51	84.00	41.50	0.00	(qty) 0.00	EA	125.50
Totals		0.00	$0	$0	$0	$0		$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS							
Unit values		1.60	90.00	44.00	0.00	(qty) 0.00	EA	134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS							
Unit values		1.70	94.00	47.00	0.00	4.00	EA	141.00
Totals		6.80	$376	$188	$0	$0		$564
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS							
Unit values		1.14	73.00	31.50	0.00	(qty) 0.00	EA	104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8							
Unit values		1.14	86.00	31.50	0.00	27.00	EA	117.50

Totals	30.78	$2,322	$851	$0	$0	$3 173
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				23.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	26.22	$1,380	$725	$0	$0	$2,105
1661388041	COMP FLUOR LAMP, 26W TUBE GLOBE ASSEMBLY				3.00 EA	
Unit values	0.13	25.50	3.44	0.00	0.00	28.94
Totals	0.38	$77	$10	$0	$0	$87
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				(qty) EA	
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	0.00	$0	$0	$0	$0	$0

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16	ELECTRICAL	55	$4,155	$1,774	$0	$0	$5,929
	ESTIMATE TOTAL	99	$4,155	$2,699	$0	$0	$6,854
	SALES TAX	5.00%	$208				
	MATL MARKUP	-40.00%	($1,662)				
	LABOR MARKUP	-13.40%		($362)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$2,701	$2,337	$0	$0	$5,038
	CONTINGENCY	10.00%					$504
	BOND	2.50%					$126
	PROFIT	10.00%					$504
	JOB TOTAL						$6,172

Estimate: Bldg. 7154 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
J02 SITEWORK	34	$0	$925	$0	$0	$92
J16 ELECTRICAL	65	$4,155	$1,774	$0	$0	$5,92
TOTAL	99	$4,155	$2,699	$0	$0	$6,85
SALES TAX	5.00%	$208				
MATL MARKUP	-40.00%	($1,662)				
LABOR MARKUP	-13.40%		($362)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$2,701	$2,337	$0	$0	$5,03
CONTINGENCY	10.00%					$50
BOND	2.50%					$12
PROFIT	10.00%					$50
JOB TOTAL						$6,17

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING
19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7150
AREA: OFFICE AREAS
AREA USE
HOURS/DAY 8
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	58 W/FIXT =	0 WATTS	0	2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP @	40 W/FIXT =	0 WATTS	0	1 LAMP @	29 W/FIXT =	0 WATTS
	2 LAMP @	86 W/FIXT =	0 WATTS	0	2 LAMP @	58 W/FIXT =	0 WATTS
	3 LAMP @	144 W/FIXT =	0 WATTS	0	3 LAMP @	87 W/FIXT =	0 WATTS
32	4 LAMP @	168 W/FIXT =	6376 WATTS	32	2 LAMP @ W/ REFLECTOR	58 W/FIXT =	1856 WATTS
8 FOOT				8 FOOT			
	2 LAMP @	100 W/FIXT =	0 WATTS	0	2 LAMP @	125 W/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	11,182	KWH/YR	ECO ENERGY CONSUMPTION 3,000 KWH/YR
	40,256	MJ/YR	13,890 MJ/YR
BASELINE DEMAND	5.39	KW	ECO DEMAND 1.86 KW

NET ENERGY SAVINGS	26,366	MJ/YR	NET DEMAND SAVINGS $408 /YR
NET ENERGY SAVINGS	24.98	MBTU/YR	NET DOLLAR SAVINGS $652 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

10 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7155
AREA: RESTROOMS/STAIRWELL
LAMP USE:
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
0 LAMPS @	52	WATTS =	0 WATTS	0 LAMPS @	13	WATTS =	0 WATTS
0 LAMPS @	60	WATTS =	0 WATTS				
0 LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
0 LAMPS @	90	WATTS =	0 WATTS	7 LAMPS @	26	WATTS =	182 WATTS
7 LAMPS @	100	WATTS =	700 WATTS				

BASELINE ENERGY CONSUMPTION	648 KWH 1,986 MJ	ECO ENERGY CONSUMPTION	142 KWH 511 MJ
BASELINE DEMAND	0.79 KW	ECO DEMAND	0.18 KW

NET ENERGY SAVINGS	1,455 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	1.38 MBTU/YR	NET DOLLAR SAVINGS	$9 /YR

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Estimate: Bldg. 7155 Date: 8 July 1994
Description: OFFICE AREA
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO. 2x4 FLUOR FIXTURES					32.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	15.52	$0	$427	$0	$0	$427
0207082123	DEMO. INCAND FIXTURES / EXIT SIGNS					7.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	1.81	$0	$50	$0	$0	$50
0002 SITEWORK		16	$0	$477	$0	$0	$477

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty) Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00	49.26
Totals		0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty) Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00	52.47
Totals		0.00	$0	$0	$0	$0	$0
1661307001	LOW BAY, AL REFLECTOR 50W HPS					0.00 EA	
Unit values		2.00	209.00	55.00	0.00	0.00	264.00
Totals		0.00	$0	$0	$0	$0	$0
1661307777	L.E.D. EXIT SIGN SINGLE FACE					(qty) EA	
Unit values		1.00	185.00	27.50	0.00	0.00	212.50
Totals		0.00	$0	$0	$0	$0	$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
Unit values		1.40	88.00	38.50	0.00	0.00	126.50
Totals		0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		1.51	84.00	41.50	0.00	0.00	125.50
Totals		0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		1.60	90.00	44.00	0.00	0.00	134.00
Totals		0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					0.00 EA	
Unit values		1.70	94.00	47.00	0.00	0.00	141.00
Totals		0.00	$0	$0	$0	$0	$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR					32.00 EA	
Unit values		1.53	106.50	41.50	0.00	0.00	148.00
Totals		48.32	$3,408	$1,328	$0	$0	$4,736
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		1.14	73.00	31.50	0.00	0.00	104.50

Totals	0.00	$0	$0	$0	$0		$0
1661309905	SUR FLUOR 1X4' W 2 32W T8						
					0.00	EA	
Unit values	1.14	86.00	31.50	0.00	0.00		117.50
Totals	0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR						
					(qty)	EA	
Unit values	1.14	90.00	31.50	0.00	0.00		121.50
Totals	0.00	$0	$0	$0	$0		$0
1661388041	COMP FLUOR LAMP, 26W TUBE GLOBE ASSEMBLY						
					7.00	EA	
Unit values	0.13	25.50	3.44	0.00	0.00		25.94
Totals	0.88	$179	$24	$0	$0		$203
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT						
					(qty)	EA	
Unit values	1.00	25.50	27.50	0.00	0.00		53.00
Totals	0.00	$0	$0	$0	$0		$0

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	50	$3,587	$1,352	$0	$0	$4,939
ESTIMATE TOTAL	66	$3,587	$1,829	$0	$0	$5,416
SALES TAX	5.00%	$179				
MATL MARKUP	-40.00%	($1,435)				
LABOR MARKUP	-13.40%		($245)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$2,332	$1,584	$0	$0	$3,915
CONTINGENCY	10.00%					$392
BOND	2.50%					$98
PROFIT	10.00%					$392
JOB TOTAL						$4,796

Estimate: Bldg. 7155 Date: 8 July 1994
Description: OFFICE AREA
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
J02 SITEWORK	18	$0	$477	$0	$0	$477
J16 ELECTRICAL	50	$3,587	$1,352	$0	$0	$4,939
TOTAL	68	$3,587	$1,829	$0	$0	$5,416
SALES TAX	5.00%	$179				
MATL MARKUP	-40.00%	($1,435)				
LABOR MARKUP	-13.40%		($245)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$2,332	$1,584	$0	$0	$3,915
CONTINGENCY	10.00%					$392
BOND	2.50%					$98
PROFIT	10.00%					$392
JOB TOTAL						$4,796

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING
10 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7250
AREA: SHOP/STORAGE AREAS
AREA USE:
HOURS/DAY 8
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
2 LAMP U	58 W/FIXT =	0	WATTS	0 2 LAMP U @	58 W/FIXT =	0	WATTS
4 FOOT				4 FOOT			
1 LAMP @	46 W/FIXT =	0	WATTS	0 1 LAMP @	29 W/FIXT =	0	WATTS
42 2 LAMP @	84 W/FIXT =	3528	WATTS	42 2 LAMP @	58 W/FIXT =	2436	WATTS
3 LAMP @	144 W/FIXT =	0	WATTS	0 3 LAMP @	87 W/FIXT =	0	WATTS
3 4 LAMP @	168 W/FIXT =	504	WATTS	3 4 LAMP @	116 W/FIXT =	354	WATTS
8 FOOT				8 FOOT			
2 LAMP @	100 W/FIXT =	0	WATTS	0 2 LAMP @	125 W/FIXT =	0	WATTS
BASELINE ENERGY CONSUMPTION		8,436	KWH/YR	ECO ENERGY CONSUMPTION		6,579	KWH/YR
		33,946	MJ/YR			23,563	MJ/YR
BASELINE DEMAND		4.83	KW	ECO DEMAND		2.79	KW

NET ENERGY SAVINGS 10,463 MJ/YR
NET ENERGY SAVINGS 9.92 MBTU/YR
NET DEMAND SAVINGS $176 /YR
NET DOLLAR SAVINGS $237 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING
10 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7186
AREA: OFFICE AREAS
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS
89 LAMPS @ 200 WATTS = 17800 WATTS

FLUORESCENT FIXTURE REPLACEMENT - 3 FOOT
30 2 LAMP @ 58 WATTS = 1740 WATTS

BASELINE ENERGY CONSUMPTION	37,804 KWH 133,286 MJ	ECO ENERGY CONSUMPTION	3,619 KWH 13,029 MJ
BASELINE DEMAND	17.80 KW	ECO DEMAND	1.74 KW

NET ENERGY SAVINGS	120,257 MJ/YR	NET DEMAND SAVINGS	$2,278 /YR
NET ENERGY SAVINGS	113.58 MBTU/YR	NET DOLLAR SAVINGS	$2,975 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7156
AREA: RESTROOM
LAMP USE:
HOURS/DAY 9
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTA 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENTS

1 LAMPS @	52	WATTS =	0 WATTS
0 LAMPS @	60	WATTS =	0 WATTS
0 LAMPS @	75	WATTS =	0 WATTS
0 LAMPS @	90	WATTS =	0 WATTS
3 LAMPS @	200	WATTS =	600 WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @	13	WATTS =	0 WATTS
0 LAMPS @	18	WATTS =	0 WATTS
3 LAMPS @	26	WATTS =	78 WATTS

BASELINE ENERGY CONSUMPTION 468 KWH
1,685 MJ
BASELINE DEMAND 0.60 KW

ECO ENERGY CONSUMPTION 61 KWH
219 MJ
ECO DEMAND 0.08 KW

NET ENERGY SAVINGS 1,466 MJ/YR
NET ENERGY SAVINGS 1.39 MBTU/YR
NET DEMAND SAVINGS $0 /YR
NET DOLLAR SAVINGS $9 /YR

Estimate: Bldg. 7156 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					45.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	21.83	$0	$601	$0	$0	$601
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					92.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	23.74	$0	$653	$0	$0	$653
U02 SITEWORK		46	$0	$1,254	$0	$0	$1,254

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307001	LOW BAY, AL REFLECTOR 50W HPS					0.00	EA	
Unit values		2.00	209.00	55.00	0.00	0.00		264.00
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN SINGLE FACE					(qty)	EA	
Unit values		1.00	185.00	27.50	0.00	0.00		212.50
Totals		0.00	$0	$0	$0	$0		$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty)	EA	
Unit values		1.40	88.00	38.50	0.00	0.00		126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					30.00	EA	
Unit values		1.51	84.00	41.50	0.00	0.00		125.50
Totals		45.30	$2,520	$1,245	$0	$0		$3,765
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.14	73.00	31.50	0.00	0.00		104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8					40.00	EA	
Unit values		1.14	86.00	31.50	0.00	0.00		117.50

Totals	45.60	$3,440	$1,260	$0	$0	$4,700
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty)	EA
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	0.00	$0	$0	$0	$0	$0
1661309911	SUR FLUOR 2X4' W 2 32W T8				2.00	EA
Unit values	1.29	95.00	35.50	0.00	0.00	130.50
Totals	2.58	$190	$71	$0	$0	$261
1661309913	SUR FLUOR 2X4' W 4 32W T8				3.00	EA
Unit values	1.51	117.00	41.50	0.00	0.00	158.50
Totals	4.53	$351	$125	$0	$0	$476
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 1 26 W PL WALL / CEILING MOUNT				1.00	EA
Unit values	1.00	30.50	27.50	0.00	0.00	58.00
Totals	1.00	$31	$28	$0	$0	$59

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	100	$6,532	$2,729	$0	$0	$9,26
ESTIMATE TOTAL	146	$6,532	$3,983	$0	$0	$10,51
SALES TAX	5.00%	$327				
MATL MARKUP	-40.00%	($2,613)				
LABOR MARKUP	-13.40%		($534)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$4,246	$3,449	$0	$0	$7,69
CONTINGENCY	10.00%					$77
BOND	2.50%					$19
PROFIT	10.00%					$77
JOB TOTAL						$9,42

Estimate: Bldg. 7156 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	46	$0	$1,254	$0	$0	$1,254
U16 ELECTRICAL	100	$6,532	$2,729	$0	$0	$9,261
TOTAL	146	$6,532	$3,983	$0	$0	$10,515
SALES TAX	5.00%	$327				
MATL MARKUP	-40.00%	($2,613)				
LABOR MARKUP	-13.40%		($534)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$4,246	$3,449	$0	$0	$7,695
CONTINGENCY	10.00%					$770
BOND	2.50%					$192
PROFIT	10.00%					$770
JOB TOTAL						$9,426

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7159
AREA: OFFICE/CONF AREA
AREA USE
HOURS/DAY 8
DAYS/WEEK 5

BUILDING VOLTAGE: 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT
0 2 LAMP U @ 55 W/FIXT = 0 WATTS

4 FOOT
0 1 LAMP @ 40 W/FIXT = 0 WATTS
42 2 LAMP @ 84 W/FIXT = 3528 WATTS
0 3 LAMP @ 144 W/FIXT = 0 WATTS
28 4 LAMP @ 168 W/FIXT = 3360 WATTS

8 FOOT
0 2 LAMP @ 160 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT
0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT
0 1 LAMP @ 29 W/FIXT = 0 WATTS
42 1 LAMP @ W/REFLECTOR 29 W/FIXT = 1218 WATTS
0 3 LAMP @ 87 W/FIXT = 0 WATTS
20 2 LAMP @ W/REFLECTOR 58 W/FIXT = 1160 WATTS

8 FOOT
0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION	14,377 KWH/YR 51,577 MJ/YR	*ECO ENERGY CONSUMPTION*	4,846 KWH/YR 17,806 MJ/YR
BASELINE DEMAND	8.99 KW	*ECO DEMAND*	2.39 KW

NET ENERGY SAVINGS	33,771 MJ/YR	NET DEMAND SAVINGS	$638 /YR
NET ENERGY SAVINGS	32.01 MBTU/YR	NET DOLLAR SAVINGS	$835 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

10 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7139
AREA:
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	32	WATTS =	0 WATTS	0 LAMPS @	13	WATTS =	0 WATTS
LAMPS @	60	WATTS =	0 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	10 LAMPS @	28	WATTS =	280 WATTS
16 LAMPS @	100	WATTS =	1600 WATTS				

BASELINE ENERGY CONSUMPTION	2,089 KWH 7,518 MJ	ECO ENERGY CONSUMPTION	541 KWH 1,947 MJ
BASELINE DEMAND	1.60 KW	ECO DEMAND	0.28 KW

NET ENERGY SAVINGS	5,541 MJ/YR	NET DEMAND SAVINGS	$105 /YR
NET ENERGY SAVINGS	5.25 MBTU/YR	NET DOLLAR SAVINGS	$137 /YR

Estimate:	Bldg. 7159	Date:	8 July 1994
Description:	OFFICE/CONF AREA		
Project:	Lighting Study	Bid Date:	
Location:	Ft. Campbell	Job #:	
Sq. footage:		City Indx:	

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
C207082121	DEMO, 2x4 FLUOR FIXTURES					
					62.00	
Unit values	0.49	0.00	13.35	0.00	0.00	13.35
Totals	30.07	$0	$828	$0	$0	$828
C207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					
					10.00	
Unit values	0.26	0.00	7.10	0.00	0.00	7.10
Totals	2.58	$0	$71	$0	$0	$71
C02 SITEWORK	33	$0	$899	$0	$0	$899

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	(qty)	Ea.	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S								
Unit values		0.94	26.74	22.52	0.00		0.00		49.26
Totals		0.00	$0	$0	$0		$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S								
Unit values		1.00	28.65	23.82	0.00		0.00		52.47
Totals		0.00	$0	$0	$0		$0		$0
1661307777	L.E.D. EXIT SIGN SINGLE FACE						(qty)	EA	
Unit values		1.00	185.00	27.50	0.00		0.00		212.50
Totals		0.00	$0	$0	$0		$0		$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS						(qty)	EA	
Unit values		1.40	88.00	38.50	0.00		0.00		126.50
Totals		0.00	$0	$0	$0		$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 1 32W T8 ACRYLIC LENS W REFLECTOR						42.00	EA	
Unit values		1.51	84.00	41.50	0.00		0.00		125.50
Totals		63.42	$3,528	$1,743	$0		$0		$5,271
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.60	90.00	44.00	0.00		0.00		134.00
Totals		0.00	$0	$0	$0		$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS						0.00	EA	
Unit values		1.70	94.00	47.00	0.00		0.00		141.00
Totals		0.00	$0	$0	$0		$0		$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR						20.00	EA	
Unit values		1.51	106.50	41.50	0.00		0.00		148.00
Totals		30.20	$2,130	$830	$0		$0		$2,960
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.14	73.00	31.50	0.00		0.00		104.50
Totals		0.00	$0	$0	$0		$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8						0.00	EA	
Unit values		1.14	86.00	31.50	0.00		0.00		117.50

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty)	EA
Unit values	1.14	90.00	31.50	0.00	0.00	121.50
Totals	0.00	$0	$0	$0	$0	$0
1661388040	COMP FLUOR LAMP, 26 W QUAD				10.00	EA
Unit values	0.50	10.50	13.75	0.00	0.00	24.25
Totals	5.00	$105	$138	$0	$0	$243
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
C16	ELECTRICAL	99	$5,763	$2,711	$0	$0	$8,474
	ESTIMATE TOTAL	132	$5,763	$3,610	$0	$0	$9,373
	SALES TAX	5.00%	$288				
	MATL MARKUP	-40.00%	($2,305)				
	LABOR MARKUP	-13.40%		($484)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$3,746	$3,126	$0	$0	$6,872
	CONTINGENCY	10.00%					$687
	BOND	2.50%					$172
	PROFIT	10.00%					$687
	JOB TOTAL						$8,418

Estimate: Bldg. 7159 Date: 8 July 1994
Description: OFFICE/CONF AREA
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	33	$0	$899	$0	$0	$899
U16 ELECTRICAL	99	$5,763	$2,711	$0	$0	$8,474
TOTAL	132	$5,763	$3,610	$0	$0	$9,373
SALES TAX	5.00%	$288				
MATL MARKUP	-40.00%	($2,305)				
LABOR MARKUP	-13.40%		($484)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$3,746	$3,126	$0	$0	$6,872
CONTINGENCY	10.00%					$687
BOND	2.50%					$172
PROFIT	10.00%					$687
JOB TOTAL						$8,418

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7190
AREA: SLEEPING AREA
AREA USE
HOURS/DAY 16
DAYS/WEEK 7

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	68 W/FIXT =	0 WATTS	0 2 LAMP U	58 W/FIXT =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP	46 W/FIXT =	0 WATTS	0 1 LAMP	20 W/FIXT =	0 WATTS
6 2 LAMP	84 W/FIXT =	504 WATTS	6 2 LAMP	58 W/FIXT =	348 WATTS
3 LAMP	144 W/FIXT =	0 WATTS	0 3 LAMP	87 W/FIXT =	0 WATTS
4 LAMP	162 W/FIXT =	0 WATTS	0 4 LAMP	116 W/FIXT =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP	160 W/FIXT =	0 WATTS	0 2 LAMP	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION		2,5[illegible] KWH/YR [illegible] MBTU/YR	ECO ENERGY CONSUMPTION		2,827 KWH/YR 7,296 MBTU/YR
BASELINE DEMAND		0.50 KW	ECO DEMAND		0.35 KW

NET ENERGY SAVINGS	3,271 MBTU/YR	NET DEMAND SAVINGS	$22 /YR
NET ENERGY SAVINGS	3.19 MBTU/YR	NET DOLLAR SAVINGS	$41 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7180
AREA: MISC AREAS
AREA USE
HOURS/DAY 24
DAYS/WEEK 7

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.76 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
2	2 LAMP U @	98 WATTS	0 WATTS	0	2 LAMP U @	58 WATTS	0 WATTS
4 FOOT				4 FOOT			
0	1 LAMP @	48 WATTS	0 WATTS	0	1 LAMP @	29 WATTS	0 WATTS
11	2 LAMP @	84 WATTS	924 WATTS	11	2 LAMP @	58 WATTS	638 WATTS
0	3 LAMP @	144 WATTS	0 WATTS	0	3 LAMP @	87 WATTS	0 WATTS
4	4 LAMP @	168 WATTS	672 WATTS	4	4 LAMP @	118 WATTS	472 WATTS
8 FOOT				8 FOOT			
0	2 LAMP @	160 WATTS	0 WATTS	0	2 LAMP @	125 WATTS	0 WATTS

BASELINE ENERGY CONSUMPTION	11,543 KWH/YR 88,194 MBTU/YR	ECO ENERGY CONSUMPTION	8,697 KWH/YR 34,909 MBTU/YR
BASELINE DEMAND	1.00 KW	ECO DEMAND	1.11 KW

NET ENERGY SAVINGS	15,285 KWH/YR	NET DEMAND SAVINGS	$69 /YR
NET ENERGY SAVINGS	14.49 MBTU/YR	NET DOLLAR SAVINGS	$158 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

16 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BMH BLDG #: 7180
AREA: RESTROOMS/MAP LIGHTS
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
6 LAMPS @	52	WATTS =	312 WATTS	8 LAMPS @	13	WATTS =	104 WATTS
2 LAMPS @	60	WATTS =	120 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	0 LAMPS @	26	WATTS =	0 WATTS
LAMPS @	150	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	899 KWH 3,235 MJ	ECO ENERGY CONSUMPTION	216 KWH 779 MJ
BASELINE DEMAND	8.43 KW	ECO DEMAND	6.19 KW

NET ENERGY SAVINGS	2,456 MJ/YR	NET DEMAND SAVINGS	$46 /YR
NET ENERGY SAVINGS	2.33 MBTU/YR	NET DOLLAR SAVINGS	$61 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: HID LIGHTING REPLACEMENT

BUILDING #: 7180
AREA: TRUCK BAYS
AREA USE:
HOURS/DAY 24
DAYS/WEEK 7
PEAK USE 1 (1-YES 2-NO)

BUILDING VOLTAGE: ___

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.79 PER KW

EXISTING FIXTURES					REPLACEMENT FIXTURES			
23 *NCAND @	208	WATTS =	4809	WATTS	23 HPS @	64	WATTS =	1472 WATTS
MV @	454	WATTS =	0	WATTS	0 MH @	300	WATTS =	0 WATTS
MV @	0875	WATTS =	0	WATTS	0 MH @	460	WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	40,180 KWH 144,648 MJ	ECO ENERGY CONSUMPTION	12,...6 KWH 46,294 MJ
BASELINE DEMAND	4.69 KW	ECO DEMAND	1.47 KW

NET ENERGY SAVINGS	98,374 KWH/YR	NET DEMAND SAVINGS	$442 /YR
NET ENERGY SAVINGS	$3.24 MBTU/YR	NET DOLLAR SAVINGS	$1,819 /YR

Estimate: Bldg. 7160 Date: 6 July 1994
Description: Fire Station
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line # / Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121 DEMO, 2x4 FLUOR FIXTURES						
Unit values	0.49	0.00	13.35	0.00	22.00 0.00	13.35
Totals	10.19	$0	$280	$0	$0	$280
0207082123 DEMO, INCAND FIXTURES / EXIT SIGNS						
Unit values	0.26	0.00	7.10	0.00	8.00 0.00	7.10
Totals	2.06	$0	$57	$0	$0	$57
0207082540 DEMO, HIGH BAY FIXTURES						
Unit values	1.00	0.00	27.50	0.00	23.00 0.00	27.50
Totals	23.00	$0	$633	$0	$0	$633
UC2 SITEWORK	26	$0	$970	$0	$0	$970

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	(qty)	Ea.	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S								
Unit values		0.94	26.74	22.52	0.00	0.00			49.26
Totals		0.00	$0	$0	$0	$0			$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S								
Unit values		1.00	28.65	23.82	0.00	0.00			52.47
Totals		0.00	$0	$0	$0	$0			$0
1661307001	LOW BAY, AL REFLECTOR 50W HPS						23.00	EA	
Unit values		2.00	209.00	55.00	0.00	0.00			264.00
Totals		46.00	$4,807	$1,265	$0	$0			$6,072
1661307777	L.E.D. EXIT SIGN SINGLE FACE						(qty)	EA	
Unit values		1.00	185.00	27.50	0.00	0.00			212.50
Totals		0.00	$0	$0	$0	$0			$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS						(qty)	EA	
Unit values		1.40	88.00	38.50	0.00	0.00			126.50
Totals		0.00	$0	$0	$0	$0			$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS						17.00	EA	
Unit values		1.51	84.00	41.50	0.00	0.00			125.50
Totals		25.67	$1,428	$706	$0	$0			$2,134
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		2.60	90.00	44.00	0.00	0.00			134.00
Totals		0.00	$0	$0	$0	$0			$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS						4.00	EA	
Unit values		2.70	94.00	47.00	0.00	0.00			141.00
Totals		6.80	$376	$188	$0	$0			$564
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		2.14	73.00	31.50	0.00	0.00			104.50
Totals		0.00	$0	$0	$0	$0			$0
1661309909	SUR FLUOR 1X4' W 2 32W T8						(qty)	EA	
Unit values		1.36	86.00	31.50	0.00	0.00			117.50

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty)	EA
Unit values	1.14	90.00	31.50	.00	0.00	121.50
Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA
Unit values	0.13	14.50	3.44	.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				8.00	EA
Unit values	1.00	25.50	27.50	.00	0.00	53.00
Totals	8.00	$204	$220	$0	$0	$424

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	87	$6,815	$2,379	$0	$0	$9,194
ESTIMATE TOTAL	123	$6,815	$3,349	$0	$0	$10,164
SALES TAX	5.00%	$341				
MATL MARKUP	-40.00%	($2,726)				
LABOR MARKUP	-13.40%		($449)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$4,430	$2,900	$0	$0	$7,330
CONTINGENCY	10.00%					$733
BOND	2.50%					$183
PROFIT	10.00%					$733
JOB TOTAL						$8,979

Estimate: Bldg. 7160 Date: 8 July 1994
Description: Fire Station
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
D02 SITEWORK	36	$0	$970	$0	$0	$970
D26 ELECTRICAL	87	$6,815	$2,379	$0	$0	$9,194
TOTAL	123	$6,815	$3,349	$0	$0	$10,164
SALES TAX	5.00%	$341				
MATL MARKUP	-40.00%	($2,726)				
LABOR MARKUP	-13.40%		($449)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$4,430	$2,900	$0	$0	$7,330
CONTINGENCY	10.00%					$733
BOND	2.50%					$183
PROFIT	10.00%					$733
JOB TOTAL						$8,979

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7164
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 9
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
5 2 LAMP U @	90 WATTS =	450 WATTS	5 2 LAMP U @	56 WATTS =	280 WATTS
4 FOOT			4 FOOT		
1 LAMP @	40 WATTS =	0 WATTS	0 1 LAMP @	20 WATTS =	0 WATTS
10 2 LAMP @	80 WATTS =	800 WATTS	10 1 LAMP @ WIREFLECTOR	29 WATTS =	290 WATTS
3 LAMP @	144 WATTS =	0 WATTS	0 3 LAMP @	87 WATTS =	0 WATTS
64 4 LAMP @	180 WATTS =	11520 WATTS	64 2 LAMP @ WIREFLECTOR	58 WATTS =	3712 WATTS
8 FOOT			8 FOOT		
2 LAMP @	130 WATTS =	0 WATTS	0 2 LAMP @	175 WATTS =	0 WATTS
BASELINE ENERGY CONSUMPTION		38,116 KWH/YR 130,117 MJ/YR	ECO ENERGY CONSUMPTION		18,843 KWH/YR 36,196 MJ/YR
BASELINE DEMAND		13.87 KW	ECO DEMAND		4.29 KW

NET ENERGY SAVINGS 73,261 MJ/YR
NET ENERGY SAVINGS 69,469 MBTU/YR

NET DEMAND SAVINGS $1,213 /YR
NET DOLLAR SAVINGS $1,636 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7164
AREA: RESTROOM
LAMP USE:
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS.
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.76 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
1 LAMPS @	52	WATTS =	0 WATTS	1 LAMPS @	13	WATTS =	13 WATTS
1 LAMPS @	60	WATTS =	60 WATTS				
0 LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
0 LAMPS @	90	WATTS =	0 WATTS	0 LAMPS @	26	WATTS =	0 WATTS
0 LAMPS @	100	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	47 KWH 168 MJ	ECO ENERGY CONSUMPTION	18 KWH 37 MJ
BASELINE DEMAND	0.06 KW	ECO DEMAND	3.81 KW

NET ENERGY SAVINGS	132 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.13 MBTU/YR	NET DOLLAR SAVINGS	$1 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7164

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	2	# EXIT SIGNS		# EXIT SIGNS	2
WATTAGE	30	WATTAGE	10	WATTAGE	3

BASELINE ENERGY CONSUMPTION	536 KWH/YR	ECO ENERGY CONSUMPTION	53 KWH/YR
	1,893 MJ/YR		189 MJ/YR
BASELINE DEMAND	0.06 KW	ECO DEMAND	0.01 KW

NET ENERGY SAVINGS	1,703 MJ/YR	NET DEMAND SAVINGS	$6 /YR
NET ENERGY SAVINGS	1.61 MBTU/YR	NET DOLLAR SAVINGS	$18 /YR

Estimate: Bldg. 7164 Date: 8 July 1994
Description: Flight Control
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082119	DEMO, 2x2, 1x4 FLUOR FIXTURES					5.00	
	Unit values	0.36	0.00	10.00	0.00	0.00	10.00
	Totals	1.82	$0	$50	$0	$0	$50
0207082121	DEMO, 2x4 FLUOR FIXTURES					74.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	35.89	$0	$988	$0	$0	$988
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					3.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	0.77	$0	$21	$0	$0	$21
U02 SITEWORK		39	$0	$1,059	$0	$0	$1,059

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					2.00	EA	
Unit values		1.00	50.00	27.50	0.00	0.00		77.50
Totals		2.00	$100	$55	$0	$0		$155
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					5.00	EA	
Unit values		1.40	88.00	38.50	0.00	0.00		126.50
Totals		7.02	$440	$193	$0	$0		$633
1661309802	REC FLUOR TROFFER 2X4' W 1 32W T8 ACRYLIC LENS W REFLECTOR					10.00	EA	
Unit values		1.51	84.00	41.50	0.00	0.00		125.50
Totals		15.10	$840	$415	$0	$0		$1,255
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					0.00	EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR					64.00	EA	
Unit values		1.51	106.50	41.50	0.00	0.00		148.00
Totals		96.64	$6,816	$2,656	$0	$0		$9,472
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.14	73.00	31.50	0.00	0.00		104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty)	EA	
Unit values		1.14	86.00	31.50	0.00	0.00		117.50

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty) EA	
Unit values	1.14	90.00	31.50	0.00	0.00	121.50
Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 13 W TUBE GLOBE ASSEMBLY				1.00 EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.13	$15	$3	$0	$0	$18
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				(qty) EA	
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	0.00	$0	$0	$0	$0	$0

Line #	Description	Manhours	Matl	Labor	Equipment	S.	Total
U16 ELECTRICAL		121	$8,211	$3,322	$0	$0	$11,533
ESTIMATE TOTAL		160	$8,211	$4,381	$0	$0	$12,592
SALES TAX		5.00%	$411				
MATL MARKUP		-40.00%	($3,284)				
LABOR MARKUP		-13.40%		($587)			
EQUIPT MARKUP		0.00%			$0		
SUB MARKUP		0.00%				$0	
TOTAL BEFORE CONTINGENC			$5,337	$3,794	$0	$0	$9,131
CONTINGENCY		10.00%					$913
BOND		2.50%					$228
PROFIT		10.00%					$913
JOB TOTAL							$11,186

Estimate: Bldg. 7164
Description: Flight Control
Project: Lighting Study
Location: Ft. Campbell
Sq. footage:
Date: 8 July 1994
Bid Date:
Job #:
City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	39	$0	$1,059	$0	$0	$1,059
U16 ELECTRICAL	121	$8,211	$3,322	$0	$0	$11,533
TOTAL	160	$8,211	$4,381	$0	$0	$12,592
SALES TAX	5.00%	$411				
MATL MARKUP	-40.00%	($3,284)				
LABOR MARKUP	-13.40%		($587)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$5,337	$3,794	$0	$0	$9,131
CONTINGENCY	10.00%					$912
BOND	2.50%					$228
PROFIT	10.00%					$913
JOB TOTAL						$11,186

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7185
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 24
DAYS/WEEK 7

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	98 W/FIXT =	0 WATTS	0 2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP @	48 W/FIXT =	0 WATTS	0 1 LAMP @	29 W/FIXT =	0 WATTS
1 2 LAMP @	90 W/FIXT =	90 WATTS	1 2 LAMP @	58 W/FIXT =	58 WATTS
7 2 LAMP @	144 W/FIXT =	1008 WATTS	7 1 LAMP @ WIREFLECTOR	29 W/FIXT =	203 WATTS
4 LAMP @	192 W/FIXT =	0 WATTS	0 4 LAMP @	116 W/FIXT =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP @	199 W/FIXT =	0 WATTS	0 2 LAMP @	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION		*9,662 KWH/YR*	*ECO ENERGY CONSUMPTION*		*2,290 KWH/YR*
		34,532 MJ/YR			*8,260 MJ/YR*
BASELINE DEMAND		*1.18 KW*	*ECO DEMAND*		*0.26 KW*

NET ENERGY SAVINGS	20,323 MJ/YR	NET DEMAND SAVINGS	$118 /YR
NET ENERGY SAVINGS	24.96 MBTU/YR	NET DOLLAR SAVINGS	$273 /YR

Estimate: Bldg. 7165 Date: 8 July 1994
Description: Runway - Radio
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Mat'l	Labor	Equipment	Sub	Total
0237082121	DEMO. 2x4 FLUOR FIXTURES						
	Unit values	0.49	0.00	13.35	0.00	6.00 0.00	13.35
	Totals	0.80	$0	$107	$0	$0	$107
002 SITEWORK		8	$0	$107	$0	$0	$107

Line #	Description	Manhours	Mat'l	Labor	Equipment	Sub	(qty)	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S						EA.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		0.00	$0	$0	$0	$0		$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S						EA.	
Unit values		1.00	28.65	23.82	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	E.E.D. EXIT SIGN SINGLE FACE						EA	
Unit values		1.00	185.00	27.50	0.00	0.00		212.50
Totals		0.00	$0	$0	$0	$0		$0
1661309501	REC FLUOR TROFFER 2X2' W 2 32W T8-U ACRYLIC LENS						EA	
Unit values		1.40	88.00	38.50	0.00	0.00		126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 1 32W T5 ACRYLIC LENS W REFLECTOR					7.00	EA	
Unit values		1.51	84.00	41.50	0.00	0.00		125.50
Totals		10.57	$588	$291	$0	$0		$879
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS						EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS						EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS						EA	
Unit values		1.14	73.00	31.50	0.00	0.00		104.50
Totals		0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8					1.00	EA	
Unit values		1.14	86.00	31.50	0.00	0.00		117.50
Totals		1.14	$86	$32	$0	$0		$118
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR						EA	
Unit values		1.14	90.00	31.50	0.00	0.00		121.50

Totals	0.00	$0	$0	$0	$0	$0
16613680421	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
16613180421	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				2.00 EA	
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	2.00	$51	$55	$0	$0	$106

Line # Description

	Manhours	Matl	Labor	Equipment	Sub	Total
CLC ELECTRICAL	14	$725	$379	$0	$0	$1,103
ESTIMATE TOTAL	16	$725	$485	$0	$0	$1,210
SALES TAX	5.00%	$36				
MATL MARKUP	-40.00%	($290)				
LABOR MARKUP	-13.40%		($65)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$471	$420	$0	$0	$891
CONTINGENCY	10.00%					$89
BOND	2.50%					$22
PROFIT	10.00%					$89
JOB TOTAL						$1,092

Estimate: Bldg. 7163 Date: 8 July 1994
Description: Runway - Radio
Project: Lightning Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
002 SITEWORK	4	$0	$107	$0	$0	$107
026 ELECTRICAL	14	$725	$378	$0	$0	$1,103
TOTAL	18	$725	$485	$0	$0	$1,210
SALES TAX	5.00%	$36				
MATL MARKUP	-40.00%	($290)				
LABOR MARKUP	-23.40%		($65)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$471	$420	$0	$0	$891
CONTINGENCY	10.00%					$89
BOND	2.50%					$22
PROFIT	10.00%					$89
JOB TOTAL						$1,092

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7170
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 9
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.18 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	88 WATTS	0 WATTS	0 2 LAMP U @	58 WATTS	0 WATTS
4 FOOT			4 FOOT		
2 1 LAMP @	42 WATTS	84 WATTS	2 1 LAMP @	29 WATTS	58 WATTS
103 2 LAMP @	84 WATTS	8652 WATTS	103 1 LAMP @ W/REFLECTOR	29 WATTS	2987 WATTS
3 LAMP @	144 WATTS	0 WATTS	0 3 LAMP @	87 WATTS	0 WATTS
24 4 LAMP @	168 WATTS	4032 WATTS	24 2 LAMP @ W/REFLECTOR	58 WATTS	1392 WATTS
8 FOOT			8 FOOT		
2 LAMP @	150 WATTS	0 WATTS	0 2 LAMP @	125 WATTS	0 WATTS
BASELINE ENERGY CONSUMPTION		28,877 KWH/YR 107,368 MJ/YR	ECO ENERGY CONSUMPTION		10,383 KWH/YR 37,377 MJ/YR
BASELINE DEMAND		12.77 KW	ECO DEMAND		4.44 KW

NET ENERGY SAVINGS 70,190 MJ/YR
NET ENERGY SAVINGS 66,52 MBTU/YR

NET DEMAND SAVINGS $1,178 /YR
NET DOLLAR SAVINGS $1,589 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7170
AREA: HALLWAY/RESTROOMS
LAMP USE:
HOURS/DAY: 8
DAYS/WEEK: 5
PEAK USE: 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 120

ELECTRIC COSTS:
ENERGY CHARGE: $0.0211 PER KWH
DEMAND CHARG: $11.78 PER KW

EXISTING INCANDESCENTS

LAMPS @	52	WATTS =	0	WATTS
LAMPS @	69	WATTS =	0	WATTS
LAMPS @	75	WATTS =	0	WATTS
LAMPS @	99	WATTS =	0	WATTS
54 LAMPS @	100	WATTS =	5400	WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @	13	WATTS =	0	WATTS
0 LAMPS @	18	WATTS =	0	WATTS
54 LAMPS @	26	WATTS =	1404	WATTS

BASELINE ENERGY CONSUMPTION	12,636 KWH 45,496 MJ	ECO ENERGY CONSUMPTION	3,285 KWH 11,827 MJ
BASELINE DEMAND	5.63 KW	ECO DEMAND	1.49 KW

NET ENERGY SAVINGS	33,682 MJ/YR	NET DEMAND SAVINGS	$565 /YR
NET ENERGY SAVINGS	31.90 MBTU/YR	NET DOLLAR SAVINGS	$762 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7179

ELECTRIC COSTS:
ENERGY CHARGE: $0.0211 PER KWH
DEMAND CHARGE: $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	10	# EXIT SIGNS		# EXIT SIGNS	10
WATTAGE	30	WATTAGE	16	WATTAGE	3

BASELINE ENERGY CONSUMPTION	2,628 KWH/YR	ECO ENERGY CONSUMPTION	263 KWH/YR
	9,461 MJ/YR		946 MJ/YR
BASELINE DEMAND	0.30 KW	ECO DEMAND	0.03 KW

NET ENERGY SAVINGS	8,515 MJ/YR	NET DEMAND SAVINGS	$38 /YR
NET ENERGY SAVINGS	8.07 MBTU/YR	NET DOLLAR SAVINGS	$88 /YR

Estimate: Bldg. 7170 Date: 5 July 1994
Description: Admin
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207062121	DEMO, 2x4 FLUCR FIXTURES					129.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	62.57	$0	$1,722	$0	$0	$1,722
0207062123	DEMO, INCAND FIXTURES / EXIT SIGNS					64.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	16.51	$0	$454	$0	$0	$454
002 SITEWORK		80	$0	$2,176	$0	$0	$2,176

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 32W LAMP R S					2.00	Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		1.88	$53	$45	$0	$0		$98
1661302300	SUR FLUOR STRIP 4' W 2 32W LAMP R S					(qty)	Ea.	
Unit values		1.00	26.65	23.52	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					10.00	EA	
Unit values		1.00	50.00	27.50	0.00	0.00		77.50
Totals		10.00	$500	$275	$0	$0		$775
1661309801	REC FLUOR TROFFER 2X2' W 2 32W T8-U ACRYLIC LENS					(qty)	EA	
Unit values		1.40	88.00	38.50	0.00	0.00		126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.51	84.00	42.50	0.00	0.00		126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		0.00	$0	$0	$0	$0		$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR					24.00	EA	
Unit values		1.51	106.50	42.50	0.00	0.00		148.00
Totals		36.24	$2,556	$996	$0	$0		$3,552
1661309807	REC FLUOR TROFFER 1X4' W 1 32W T8 ACRYLIC LENS					95.00	EA	
Unit values		1.14	80.00	31.50	0.00	0.00		111.50
Totals		108.30	$7,600	$2,993	$0	$0		$10,593
1661309909	SUR FLUOR 1X4' W 2 32W T8					8.00	EA	
Unit values		1.14	93.00	31.50	0.00	0.00		124.50

Totals	9.12	$744	$252	$0	$0	$996
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty)	EA
Unit values	1.14	90.00	31.50	0.00	0.00	121.50
Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				54.00	EA
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	54.00	$1,377	$1,485	$0	$0	$2,862

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	220	$12,830	$6,046	$0	$0	$18,876
ESTIMATE TOTAL	300	$12,830	$8,222	$0	$0	$21,052
SALES TAX	5.00%	$642				
MATL MARKUP	-40.00%	($5,132)				
LABOR MARKUP	-13.40%		($1,102)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$8,340	$7,120	$0	$0	$15,460
CONTINGENCY	10.00%					$1,546
BOND	2.50%					$386
PROFIT	10.00%					$1,546
JOB TOTAL						$18,938

Estimate: Bldg. 7170 Date: 8 July 1994
Description: Admin
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
UC2 SITEWORK	80	$0	$2,176	$0	$0	$2,176
UL6 ELECTRICAL	220	$12,830	$6,046	$0	$0	$18,876
TOTAL	300	$12,830	$8,222	$0	$0	$21,052
SALES TAX	5.00%	$642				
MATL MARKUP	-40.00%	($5,132)				
LABOR MARKUP	-13.40%		($1,102)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$8,340	$7,120	$0	$0	$15,460
CONTINGENCY	10.00%					$1,546
BOND	2.50%					$386
PROFIT	10.00%					$1,546
JOB TOTAL						$18,938

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7178
AREA: SHOP/OFFICE
AREA USE
HOURS/DAY 8
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U @	36 WATT =	0 WATTS	0 2 LAMP U @	5 WATT =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP @	40 WATT =	0 WATTS	0 1 LAMP @	22 WATT =	0 WATTS
40 2 LAMP @	84 WATT =	3360 WATTS	40 2 LAMP @	58 WATT =	2320 WATTS
4 3 LAMP @	126 WATT =	504 WATTS	4 3 LAMP @	87 WATT =	348 WATTS
4 LAMP @	192 WATT =	0 WATTS	0 4 LAMP @	115 WATT =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP @	180 WATT =	0 WATTS	0 2 LAMP @	125 WATT =	0 WATTS

BASELINE ENERGY CONSUMPTION	8,037 KWH/YR 28,934 MJ/YR	ECO ENERGY CONSUMPTION	5,549 KWH/YR 19,978 MJ/YR
BASELINE DEMAND	3.86 KW	ECO DEMAND	2.67 KW

NET ENERGY SAVINGS	8,956 MJ/YR	NET DEMAND SAVINGS	$169 /YR
NET ENERGY SAVINGS	8.48 MBTU/YR	NET DOLLAR SAVINGS	$222 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7176

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	3	# EXIT SIGNS		# EXIT SIGNS	3
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	788 KWH/YR	ECO ENERGY CONSUMPTION	73 KWH/YR
	2,839 MJ/YR		264 MJ/YR
BASELINE DEMAND	0.09 KW	ECO DEMAND	0.01 KW

NET ENERGY SAVINGS	2,564 MJ/YR	NET DEMAND SAVINGS	$11 /YR
NET ENERGY SAVINGS	2.43 MBTU/YR	NET DOLLAR SAVINGS	$26 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING HID LIGHTING REPLACEMENT

BUILDING #: 7178
AREA: SHOP
AREA USE
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES 2-NO)

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACEMENT FIXTURES			
39 MV @	265	WATTS = 10830	WATTS	36 HPS @	130	WATTS = 4940	WATTS
0 MV @	455	WATTS = 0	WATTS	0 MH @	300	WATTS = 0	WATTS
0 MV @	1075	WATTS = 0	WATTS	0 MH @	460	WATTS = 0	WATTS

BASELINE ENERGY CONSUMPTION	22,328 KWH	ECO ENERGY CONSUMPTION	10,275 KWH
	81,086 MJ		39,991 MJ
BASELINE DEMAND	10.83 KW	ECO DEMAND	4.9 KW

NET ENERGY SAVINGS	44,184 MJ/YR	NET DEMAND SAVINGS	$833 /YR
NET ENERGY SAVINGS	41.89 MBTU/YR	NET DOLLAR SAVINGS	$1,091 /YR

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Estimate: Bldg. 7176 Date: 8 July 1994
Description: SHOP/OFFICE
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Index:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					44.00	
Unit values		0.49	C.00	13.35	0.00	0.00	13.35
Totals		21.34	$0	$587	$0	$0	$587
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					3.00	
Unit values		0.26	C.00	7.10	0.00	0.00	7.10
Totals		0.77	$0	$21	$0	$0	$21
0207082540	DEMO, HIGH BAY FIXTURES					58.00	
Unit values		1.00	0.00	27.50	C.00	0.00	27.50
Totals		54.00	$0	$1,595	$0	$0	$1,595
U01	SITEWORK	81	$0	$2,203	$0	$0	$2,203

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					0.00 Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00	49.26
Totals		0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty) Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00	52.47
Totals		0.00	$0	$0	$0	$0	$0
1661307001	LOW BAY, AL REFLECTOR 50W HPS					38.00 EA	
Unit values		2.00	209.00	55.00	0.00	0.00	264.00
Totals		76.00	$7,942	$2,090	$0	$0	$10,032
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					3.00 EA	
Unit values		1.00	50.00	27.50	0.00	0.00	77.50
Totals		3.00	$150	$83	$0	$0	$233
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
Unit values		1.40	88.00	38.50	0.00	0.00	126.50
Totals		0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					0.00 EA	
Unit values		1.52	84.00	41.50	0.00	0.00	125.50
Totals		0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					4.00 EA	
Unit values		2.60	90.00	44.00	0.00	0.00	134.00
Totals		6.40	$360	$176	$0	$0	$536
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		2.75	94.00	47.00	0.00	0.00	141.00
Totals		0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					0.00 EA	
Unit values		2.14	73.00	31.50	0.00	0.00	104.50
Totals		0.00	$0	$0	$0	$0	$0
1661309809	SUR FLUOR 1X4' W 2 32W T8					0.00 EA	
Unit values		2.14	86.00	31.50	0.00	0.00	117.50

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 2X4' W 2 32W T8 TWO-PIECE REFLECTOR				40.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	45.60	$2,400	$1,260	$0	$0	$3,660
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 2 13 W RL WALL / CEILING MOUNT				0.00 EA	
Unit values	2.00	25.50	27.50	0.00	0.00	53.00
Totals	0.00	$0	$0	$0	$0	$0

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	131	$10,852	$3,609	$0	$0	$14,461
ESTIMATE TOTAL	212	$10,852	$5,812	$0	$0	$16,664
SALES TAX	5.00%	$543				
MATL MARKUP	-40.00%	($4,341)				
LABOR MARKUP	-13.40%		($779)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,054	$5,033	$0	$0	$12,087
CONTINGENCY	10.00%					$1,209
BOND	2.50%					$302
PROFIT	10.00%					$1,209
JOB TOTAL						$14,807

Estimate: Bldg. 7176 Date: 8 July 1994
Description: SHOP/OFFICE
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	81	$0	$2,203	$0	$0	$2,203
U16 ELECTRICAL	131	$10,852	$3,609	$0	$0	$14,461
TOTAL	212	$10,852	$5,812	$0	$0	$16,664
SALES TAX	5.00%	$543				
MATL MARKUP	-40.00%	($4,341)				
LABOR MARKUP	-13.40%		($779)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,054	$5,033	$0	$0	$12,087
CONTINGENCY	10.00%					$1,209
BOND	2.50%					$302
PROFIT	10.00%					$1,209
JOB TOTAL						$14,807

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7179
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 10
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE Data			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	98 W/FIXT =	0 WATTS	0 2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP @	48 W/FIXT =	0 WATTS	0 1 LAMP @	29 W/FIXT =	0 WATTS
83 2 LAMP @	84 W/FIXT =	6972 WATTS	83 1 LAMP @ WIREFLECTOR	29 W/FIXT =	2407 WATTS
3 LAMP @	144 W/FIXT =	0 WATTS	0 3 LAMP @	87 W/FIXT =	0 WATTS
16 4 LAMP @	168 W/FIXT =	2688 WATTS	16 2 LAMP @ WIREFLECTOR	58 W/FIXT =	928 WATTS
8 FOOT			8 FOOT		
2 LAMP @	190 W/FIXT =	0 WATTS	0 2 LAMP @	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION		23,116 KWH/YR	ECO ENERGY CONSUMPTION		4,671 KWH/YR
		80,418 MJ/YR			31,218 MJ/YR
BASELINE DEMAND		9.66 KW	ECO DEMAND		3.34 KW

NET ENERGY SAVINGS	39,202 MJ/YR	NET DEMAND SAVINGS	$894 /YR
NET ENERGY SAVINGS	36.11 MBTU/YR	NET DOLLAR SAVINGS	$1,241 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7078
AREA: RESTROOMS
LAMP USE
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52	WATTS =	0 WATTS	0 LAMPS @	13	WATTS =	0 WATTS
LAMPS @	60	WATTS =	0 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
5 LAMPS @	90	WATTS =	450 WATTS	5 LAMPS @	26	WATTS =	130 WATTS
LAMPS @	100	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	361 KWH 1,284 MJ	ECO ENERGY CONSUMPTION	181 KWH 365 MJ
BASELINE DEMAND	0.45 KW	ECO DEMAND	0.13 KW

NET ENERGY SAVINGS	899 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.85 MBTU/YR	NET DOLLAR SAVINGS	$5 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7179

ELECTRIC COSTS:
ENERGY CHARGE $0.021 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	4	# EXIT SIGNS		# EXIT SIGNS	4
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	1,051 KWH/YR 3,784 MJ/YR	ECO ENERGY CONSUMPTION	165 KWH/YR 378 MJ/YR
BASELINE DEMAND	0.12 KW	ECO DEMAND	0.01 KW

NET ENERGY SAVINGS	3,406 MJ/YR	NET DEMAND SAVINGS	$15 /YR
NET ENERGY SAVINGS	3.23 MBTU/YR	NET DOLLAR SAVINGS	$35 /YR

Estimate: Bldg. 7179 Date: 8 July 1994
Description: Control Group
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					99.00	
Unit values		0.49	0.00	13.35	0.00	0.00	13.35
Totals		48.02	$0	$1,322	$0	$0	$1,322
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					9.00	
Unit values		0.26	0.00	7.10	0.00	0.00	7.10
Totals		2.32	$0	$64	$0	$0	$64
U02 SITEWORK		51	$0	$1,386	$0	$0	$1,386

Job
Oper

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661307777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE					4.00	EA
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	4.00	$200	$110	$0	$0	$310
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty)	EA
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					0.00	EA
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309805	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR					16.00	
	Unit values	1.51	106.50	41.50	0.00	0.00	148.00
	Totals	24.16	$1,704	$664	$0	$0	$2,368
1661309807	REC FLUOR TROFFER 1X4' W 1 32W T8 ACRYLIC LENS					83.00	EA
	Unit values	1.14	80.00	31.50	0.00	0.00	111.50
	Totals	94.62	$6,640	$2,615	$0	$0	$9,255
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty)	EA
	Unit values	1.14	86.00	31.50	0.00	0.00	117.50

Totals	0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR						
Unit values	1.14	90.00	31.50	0.00	(qty) 0.00	EA	121.50
Totals	0.00	$0	$0	$0	$0		$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY						
Unit values	0.13	14.50	3.44	0.00	(qty) 0.00	EA	17.94
Totals	0.00	$0	$0	$0	$0		$0
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT						
Unit values	1.00	25.50	27.50	0.00	5.00	EA	53.00
Totals	5.00	$128	$138	$0	$0		$266

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
016	ELECTRICAL	126	$8,672	$3,527	$0	$0	$12,199
	ESTIMATE TOTAL	179	$8,672	$4,913	$0	$0	$13,585
	SALES TAX	5.00%	$434				
	MATL MARKUP	-40.0 %	($3,469)				
	LABOR MARKUP	-13.4 %		($658)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$5,637	$4,255	$0	$0	$9,891
	CONTINGENCY	10.00%					$989
	BOND	2.50%					$247
	PROFIT	10.00%					$989
	JOB TOTAL						$12,117

Estimate: Bldg. 7179 Date: 8 July 1994
Description: Control Group
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
312 SITEWORK	51	$0	$1,386	$0	$0	$1,38
314 ELECTRICAL	128	$8,672	$3,527	$0	$0	$12,19
TOTAL	179	$8,672	$4,913	$0	$0	$13,58
SALES TAX	5.00%	$434				
MATL MARKUP	-40.00%	($3,469)				
LABOR MARKUP	-13.40%		($658)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$5,637	$4,255	$0	$0	$9,89
CONTINGENCY	10.00%					$98
BOND	2.50%					$24
PROFIT	10.00%					$98
JOB TOTAL						$12,11

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

18 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7206
AREA: ENTIRE BLDG
AREA USE
HOURS/DAY 10
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	88 WATTS	0 WATTS	0	2 LAMP U @	58 WATTS	0 WATTS
4 FOOT				4 FOOT			
15	1 LAMP @	45 WATTS	675 WATTS	15	1 LAMP @	29 WATTS	435 WATTS
113	2 LAMP @	90 WATTS	10170 WATTS	117	2 LAMP @	59 WATTS	6554 WATTS
2	3 LAMP @	135 WATTS	270 WATTS	2	3 LAMP @	87 WATTS	174 WATTS
	4 LAMP @	180 WATTS	0 WATTS	0	4 LAMP @	118 WATTS	0 WATTS
8 FOOT				8 FOOT			
	2 LAMP @	180 WATTS	0 WATTS	0	2 LAMP @	125 WATTS	0 WATTS

BASELINE ENERGY CONSUMPTION	*28,899 KWH/YR*	*ECO ENERGY CONSUMPTION*	*18,624 KWH/YR*
	104,036 MJ/YR		*67,046 MJ/YR*
BASELINE DEMAND	*11.12 KW*	*ECO DEMAND*	*7.16 KW*

NET ENERGY SAVINGS	36,990 MJ/YR	NET DEMAND SAVINGS	$559 /YR
NET ENERGY SAVINGS	35.06 MBTU/YR	NET DOLLAR SAVINGS	$775 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7208

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS		# EXIT SIGNS	10	# EXIT SIGNS	10
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	1,577 KWH/YR	ECO ENERGY CONSUMPTION	263 KWH/YR
	5,676 MJ/YR		946 MJ/YR
BASELINE DEMAND	0.18 KW	ECO DEMAND	0.03 KW

NET ENERGY SAVINGS	4,730 MJ/YR	NET DEMAND SAVINGS	$21 /YR
NET ENERGY SAVINGS	4.48 MBTU/YR	NET DOLLAR SAVINGS	$49 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7208
AREA: HANGAR AND SHOP BAYS
AREA USE.
HOURS/DAY 10
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

BUILDING VOLTAGE: 277

EXISTING FIXTURES				REPLACMENT FIXTURES			
INCAND @	200	WATTS =	0 WATTS	HPS @	64	WATTS =	0 WATTS
20 MV @	454	WATTS =	9080 WATTS	20 MH @	300	WATTS =	6000 WATTS
42 MV @	1075	WATTS =	45150 WATTS	42 MH @	460	WATTS =	19320 WATTS

BASELINE ENERGY CONSUMPTION	140,996 KWH 507,593 MJ	ECO ENERGY CONSUMPTION	65,832 KWH 236,995 MJ
BASELINE DEMAND	54.23 KW	ECO DEMAND	25.32 KW

NET ENERGY SAVINGS	270,598 MJ/YR	NET DEMAND SAVINGS	$4,087 /YR
NET ENERGY SAVINGS	256.47 MBTU/YR	NET DOLLAR SAVINGS	$5,673 /YR

Estimate: Bldg. 7206 Date: 5 July 1994
Description: hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					130.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	63.05	$0	$1,736	$0	$0	$1,736
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					10.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	2.58	$0	$71	$0	$0	$71
0207082540	DEMO, HIGH BAY FIXTURES					62.00	
	Unit values	1.00	0.00	27.50	0.00	0.00	27.50
	Totals	62.00	$0	$1,705	$0	$0	$1,705
U02	SITEWORK	126	$0	$3,512	$0	$0	$3,512

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 32W LAMP R S					15.00 Ea.	
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	14.12	$401	$335	$0	$0	$739
1661302300	SUR FLUOR STRIP 4' W 2 32W LAMP R S					30.00 Ea.	
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	30.00	$860	$714	$0	$0	$1,574
1661304291	HIGH BAY, AL REFLECTOR 400W MH					42.00 EA	
	Unit values	3.48	295.00	95.50	0.00	0.00	390.50
	Totals	146.08	$12,390	$4,011	$0	$0	$16,401
1661304292	HIGH BAY, AL REFLECTOR 250W MH					20.00 EA	
	Unit values	3.48	243.00	95.50	0.00	0.00	338.50
	Totals	69.56	$4,860	$1,910	$0	$0	$6,770
1661307777	L.E.D. EXIT SIGN SINGLE FACE					10.00 EA	
	Unit values	1.00	50.00	27.50	0.00	0.00	80
	Totals	10.00	$500	$275	$0	$0	$5
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
	Unit values	1.40	88.00	38.50	0.00	0.00	126
	Totals	0.00	$0	$0	$0	$0	
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					2.00 EA	
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	3.20	$180	$88	$0	$0	$268
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					83.00 EA	
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50

Totals	94.62	$6,059	$2,615	$0	$0	$8,674
1661309909	SUR FLUOR 1X4' W 2 32W T8					
Unit values	1.14	66.00	31.50	0.00	(qty) 0.00	EA 117.50
Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					
Unit values	1.14	90.00	31.50	0.00	(qty) 0.00	EA 221.50
Totals	0.00	$0	$0	$0	$0	$0
1661393041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY					
Unit values	0.13	14.50	3.44	0.00	(qty) 0.00	EA 17.94
Totals	0.00	$0	$0	$0	$0	$0

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
016	ELECTRICAL	368	$25,250	$9,951	$0		$35,201
	ESTIMATE TOTAL	496	$25,250	$13,463	$0	$0	$38,713
	SALES TAX	5.00%	$1,263				
	MATL MARKUP	-40.00%	($10,100)				
	LABOR MARKUP	-13.40%		($1,804)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$16,413	$11,659	$0	$0	$28,071
	CONTINGENCY	10.00%					$2,807
	BOND	2.50%					$702
	PROFIT	10.00%					$2,807
	JOB TOTAL						$34,388

Estimate: Bldg. 7206 Date: 8 July 1994
Description. hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
J02 SITEWORK	128	$0	$3,512	$0	$0	$3,512
J16 ELECTRICAL	368	$25,250	$9,951	$0	$0	$35,201
TOTAL	496	$25,250	$13,463	$0	$0	$38,713
SALES TAX	5.00%	$1,263				
MATL MARKUP	-40.00%	($10,100)				
LABOR MARKUP	-13.40%		($1,804)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$16,413	$11,659	$0	$0	$28,071
CONTINGENCY	10.00%					$2,807
BOND	2.50%					$702
PROFIT	10.00%					$2,807
JOB TOTAL						$34,388

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING
19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7208
AREA: ENTIRE BLDG
AREA USE
HOURS/DAY 10
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	98 W/FIXT =	0 WATTS	0 2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT			4 FOOT		
1 LAMP @	48 W/FIXT =	0 WATTS	0 1 LAMP @	29 W/FIXT =	0 WATTS
195 2 LAMP @	84 W/FIXT =	16380 WATTS	190 2 LAMP @	58 W/FIXT =	11020 WATTS
14 3 LAMP @	126 W/FIXT =	1764 WATTS	14 3 LAMP @	87 W/FIXT =	1218 WATTS
4 LAMP @	192 W/FIXT =	0 WATTS	0 4 LAMP @	116 W/FIXT =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP @	160 W/FIXT =	0 WATTS	0 2 LAMP @	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION		*46,082 KWH/YR*	*ECO ENERGY CONSUMPTION*		*31,819 KWH/YR*
		165,897 MJ/YR			*114,548 MJ/YR*
BASELINE DEMAND		*17.72 KW*	*ECO DEMAND*		*12.24 KW*

NET ENERGY SAVINGS $1,349 $/YR
NET ENERGY SAVINGS 48.67 MBTU/YR
NET DEMAND SAVINGS $778 /YR
NET DOLLAR SAVINGS $1,676 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1004

INTERIOR LIGHTING. INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7208
AREA: RESTROOMS
LAMP USE
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS.
ENERGY CHARGE $0 0211 PER KWH
DEMAND CHARG $11 75 PER KW

EXISTING INCANDESCENTS

LAMPS @	52	WATTS =	0	WATTS
4 LAMPS @	60	WATTS =	240	WATTS
LAMPS @	75	WATTS =	0	WATTS
LAMPS @	90	WATTS =	0	WATTS
LAMPS @	100	WATTS =	0	WATTS

COMPACT FLUORESCENT REPLACEMENT

4 LAMPS @	13	WATTS =	52	WATTS
0 LAMPS @	18	WATTS =	0	WATTS
0 LAMPS @	26	WATTS =	0	WATTS

BASELINE ENERGY CONSUMPTION	187 KWH 674 MJ	ECO ENERGY CONSUMPTION	41 KWH 146 MJ
BASELINE DEMAND	6.24 KW	ECO DEMAND	0.05 KW

NET ENERGY SAVINGS	538 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.59 MBTU/YR	NET DOLLAR SAVINGS	$3 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7208
AREA: OFFICE
LAMP USE:
HOURS/DAY 10
DAYS/WEEK 5
PEAK USE 1 (1-YES 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS.
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENTS		FLUORESCENT FIXTURE REPLACEMENT	
2 LAMPS @ 405 WATTS =	810 WATTS	1,2 LAMP @ 58 WATTS =	58 WATTS
BASELINE ENERGY CONSUMPTION	*3,186 KWH*	*ECO ENERGY CONSUMPTION*	*151 KWH*
	7,582 MJ		*543 MJ*
BASELINE DEMAND	*0.81 KW*	*ECO DEMAND*	*0.06 KW*

NET ENERGY SAVINGS	7,039 MJ/YR	NET DEMAND SAVINGS	$106 /YR
NET ENERGY SAVINGS	6.67 MBTU/YR	NET DOLLAR SAVINGS	$148 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7208
AREA: HANGAR BAY/STORAGE
AREA USE
HOURS/DAY 10
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE. 277

ELECTRIC COSTS.
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.79 PER KW

EXISTING FIXTURES				REPLACMENT FIXTURES			
RCAND @	200	WATTS =	0 WATTS	HPS @	64	WATTS =	0 WATTS
28 MV @	456	WATTS =	12712 WATTS	28 MH @	300	WATTS =	8400 WATTS
96 MV @	1075	WATTS =	103200 WATTS	96 MH @	460	WATTS =	44160 WATTS

BASELINE ENERGY CONSUMPTION	301,371 KWH	ECO ENERGY CONSUMPTION	138,656 KWH
	1,084,936 MJ		491,962 MJ
BASELINE DEMAND	115.91 KW	ECO DEMAND	52.56 KW

NET ENERGY SAVINGS	592,976 MJ/YR	NET DEMAND SAVINGS	$8,955 /YR
NET ENERGY SAVINGS	562.81 MBTU/YR	NET DOLLAR SAVINGS	$12,431 /YR

Estimate: Bldg. 7206 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
02070820121	DEMO, 2x4 FLUOR FIXTURES					204.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	98.94	$0	$2,723	$0	$0	$2,723
02070820123	DEMO, INCAND FIXTURES / EXIT SIGNS					6.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	1.55	$0	$43	$0	$0	$43
02070825400	DEMO, HIGH BAY FIXTURES					124.00	
	Unit values	1.00	0.00	27.50	0.00	0.00	27.50
	Totals	124.00	$0	$3,410	$0	$0	$3,410
02070	SITEWORK	225	$0	$6,176	$0	$0	$6,176

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
16613C2200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.
	Unit values	0.94	26.74	22.52	0.00	0.00	49.
	Totals	0.00	$0	$0	$0	$0	
16613C2300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.
	Unit values	1.00	29.65	23.80	0.00	0.00	53.
	Totals	0.00	$0	$0	$0	$0	
16613C4291	HIGH BAY, AL REFLECTOR 400W MH					96.00	EA
	Unit values	3.48	295.00	95.50	0.00	0.00	390.
	Totals	333.89	$28,320	$9,168	$0	$0	$37,4
16613C4292	HIGH BAY, AL REFLECTOR 250W MH					28.00	EA
	Unit values	3.48	243.00	95.50	0.00	0.00	338.
	Totals	97.38	$6,804	$2,674	$0	$0	$9,4
16613C7777	L.E.D. EXIT SIGN SINGLE FACE					(qty)	EA
	Unit values	1.00	185.00	27.50	0.00	0.00	212.
	Totals	0.00	$0	$0	$0	$0	
16613C9801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty)	EA
	Unit values	1.40	88.00	38.50	0.00	0.00	126.
	Totals	0.00	$0	$0	$0	$0	
16613C9802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.51	84.00	41.50	0.00	0.00	125.
	Totals	0.00	$0	$0	$0	$0	
16613C9803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					14.00	EA
	Unit values	1.60	90.00	44.00	0.00	0.00	134.
	Totals	22.40	$1,260	$616	$0	$0	$1,8
16613C9804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.70	94.00	47.00	0.00	0.00	141.
	Totals	0.00	$0	$0	$0	$0	
16613C9807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					190.00	EA
	Unit values	1.14	73.00	31.50	0.00	0.00	104.

Totals	216.60	$13,871	$5,955	$0	$0	$19,8
1661309909	SUR FLUOR 1X4' W 2 32W T8				(qty) EA	
Unit values	1.14	66.00	31.50	0.00	0.00	117.
Totals	0.00	$0	$0	$0	$0	
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				1.00 EA	
Unit values	1.14	57.00	31.50	0.00	0.00	88.
Totals	1.14	$57	$32	$0	$0	$
1661309912	SUR FLUOR 2X4' W 3 32W T8				(qty) EA	
Unit values	1.40	115.00	38.50	0.00	0.00	153.
Totals	0.00	$0	$0	$0	$0	
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.
Totals	0.00	$0	$0	$0	$0	
1661388042	COMP FLUOR FIX. 2 13 W PL WALL / CEILING MOUNT				4.00 EA	
Unit values	1.00	25.50	27.50	0.00	0.00	53.
Totals	4.00	$102	$110	$0	$0	$2

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	676	$50,413	$18,555	$0	$0	$68,998
ESTIMATE TOTAL	901	$50,413	$24,761	$0	$0	$75,174
SALES TAX	5.00%	$2,521				
MATL MARKUP	40.00%	($20,165)				
LABOR MARKUP	13.40%		($3,318)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$32,768	$21,443	$0	$0	$54,211
CONTINGENCY	10.00%					$5,421
BOND	2.50%					$1,355
PROFIT	10.00%					$5,421
JOB TOTAL						$66,409

Estimate: Bldg. 721A Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	225	$0	$6,176	$0	$0	$6,176
U16 ELECTRICAL	676	$50,413	$18,585	$0	$0	$68,998
TOTAL	901	$50,413	$24,761	$0	$0	$75,174
SALES TAX	5.00%	$2,521				
MATL MARKUP	-40.00%	($20,165)				
LABOR MARKUP	-13.40%		($3,318)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$32,768	$21,443	$0	$0	$54,211
CONTINGENCY	10.00%					$5,421
BOND	2.50%					$1,355
PROFIT	10.00%					$5,421
JOB TOTAL						$66,409

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7219
AREA:
AREA USE:
HOURS/DAY 10
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT				
	2 LAMP U @	98	WF/FXT =	0 WATTS
4 FOOT				
24	1 LAMP @	42	WF/FXT =	1008 WATTS
213	2 LAMP @	84	WF/FXT =	17892 WATTS
	3 LAMP @	144	WF/FXT =	0 WATTS
	4 LAMP @	192	WF/FXT =	0 WATTS
8 FOOT				
	2 LAMP @	160	WF/FXT =	0 WATTS

BASELINE ENERGY CONSUMPTION 49,148 KWH/YR
175,584 MJ/YR
BASELINE DEMAND 18.90 KW

REPLACEMENT FIXTURE DATA

2 FOOT				
0	2 LAMP U @	58	WF/FXT =	0 WATTS
4 FOOT				
24	1 LAMP @	29	WF/FXT =	696 WATTS
213	2 LAMP @	58	WF/FXT =	12354 WATTS
0	3 LAMP @	87	WF/FXT =	0 WATTS
0	4 LAMP @	116	WF/FXT =	0 WATTS
8 FOOT				
0	2 LAMP @	125	WF/FXT =	0 WATTS

ECO ENERGY CONSUMPTION 33,930 KWH/YR
122,148 MJ/YR
ECO DEMAND 13.05 KW

NET ENERGY SAVINGS 53,756 MJ/YR
NET ENERGY SAVINGS 51.00 MBTU/YR

NET DEMAND SAVINGS $827 /YR
NET DOLLAR SAVINGS $1,148 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7210
AREA:
LAMP USE:
HOURS/DAY 10
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS.
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS					COMPACT FLUORESCENT REPLACEMENT				
	LAMPS @	52	WATTS =	0 WATTS	1 LAMPS @	13	WATTS =	13 WATTS
1	LAMPS @	60	WATTS =	60 WATTS				
	LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
	LAMPS @	90	WATTS =	0 WATTS	0 LAMPS @	26	WATTS =	0 WATTS
	LAMPS @	100	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	*156 KWH* *562 MJ*	*ECO ENERGY CONSUMPTION*	*34 KWH* *122 MJ*
BASELINE DEMAND	*0.06 KW*	*ECO DEMAND*	*0.01 KW*

NET ENERGY SAVINGS	440 MJ/YR	NET DEMAND SAVINGS	$7 /YR
NET ENERGY SAVINGS	0.42 MBTU/YR	NET DOLLAR SAVINGS	$9 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7210

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS		# EXIT SIGNS	10	# EXIT SIGNS	10
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	1,577 KWH/YR 5,678 MJ/YR	ECO ENERGY CONSUMPTION	263 KWH/YR 946 MJ/YR
BASELINE DEMAND	0.18 KW	ECO DEMAND	0.03 KW

NET ENERGY SAVINGS	4,730 MJ/YR	NET DEMAND SAVINGS	$21 /YR
NET ENERGY SAVINGS	4.48 MBTU/YR	NET DOLLAR SAVINGS	$49 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7210
AREA: HANGAR BAY
AREA USE:
HOURS/DAY 10
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 277

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACMENT FIXTURES			
8 ICAND @	200	WATTS = 0	WATTS	HPS @	84	WATTS = 0	WATTS
39 MV @	454	WATTS = 17706	WATTS	39 MH @	300	WATTS = 11700	WATTS
50 MV @	1075	WATTS = 53750	WATTS	50 MH @	460	WATTS = 23000	WATTS

BASELINE ENERGY CONSUMPTION	*185,786 KWH* *668,830 MJ*	*ECO ENERGY CONSUMPTION*	*90,220 KWH* *324,792 MJ*
BASELINE DEMAND	*71.46 KW*	*ECO DEMAND*	*34.76 KW*

NET ENERGY SAVINGS	344,038 MJ/YR	NET DEMAND SAVINGS	$5,196 /YR
NET ENERGY SAVINGS	326.07 MBTU/YR	NET DOLLAR SAVINGS	$7,212 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

EXTERIOR LIGHTING REPLACEMENT

BUILDING #: 7210

AREA USE:
HOURS/YR 4400

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACEMENT FIXTURES			
6 INCAND @	100	WATTS =	600 WATTS	6 HPS @	46	WATTS =	276 WATTS
QUARTZ @	200	WATTS =	0 WATTS	0 HPS @	46	WATTS =	0 WATTS
MV @	454	WATTS =	0 WATTS	6 HPS @	186	WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	*2,640 KWH*	*ECO ENERGY CONSUMPTION*	*1,214 KWH*
	9,504 MJ		*4,372 MJ*
BASELINE DEMAND	*6.60 KW*	*ECO DEMAND*	*0.28 KW*

NET ENERGY SAVINGS 5,132 MJ/YR
NET ENERGY SAVINGS 4.86 MBTU/YR

NET DOLLAR SAVINGS $30 /YR

Estimate: Bldg. 7210 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					237.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	114.95	$0	$3,164	$0	$0	$3,164
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					17.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	4.39	$0	$121	$0	$0	$121
0207082540	DEMO, HIGH BAY FIXTURES					89.00	
	Unit values	1.00	0.00	27.50	0.00	0.00	27.50
	Totals	89.00	$0	$2,448	$0	$0	$2,448
U02	SITEWORK	209	$0	$5,733	$0	$0	$5,733

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 32W LAMP R S					24.00 Ea.	
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	22.58	$642	$540	$0	$0	$1,182
1661302300	SUR FLUOR STRIP 4' W 2 32W LAMP R S					(qty) Ea.	
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661304289	EXTERIOR 35W HPS WALL PACK					6.00 EA	
	Unit values	1.00	75.00	27.50	0.00	0.00	102.50
	Totals	6.00	$450	$165	$0	$0	$615
1661304291	HIGH BAY, AL REFLECTOR 400W MH					50.00 EA	
	Unit values	3.48	295.00	95.50	0.00	0.00	390.50
	Totals	173.90	$14,750	$4,775	$0	$0	$19,525
1661304292	HIGH BAY, AL REFLECTOR 250W MH					39.00 EA	
	Unit values	3.48	243.00	95.50	0.00	0.00	338.50
	Totals	135.64	$9,477	$3,725	$0	$0	$13,202
1661307777	L.E.D. EXIT SIGN SINGLE FACE					10.00 EA	
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	10.00	$500	$275	$0	$0	$775
1661309601	REC FLUOR TROFFER 2X2' W 2 32W T8-U ACRYLIC LENS					(qty) EA	
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	2.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					0.00 EA	
	Unit values	2.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00

Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS				213.00 EA	
Unit values	1.14	75.00	31.50	0.00	0.00	304.50
Totals	242.82	$15,949	$6,720	$0	$0	$22,259
1661309909	SUR FLUOR 1X4' W 2 32W T8				(qty) EA	
Unit values	1.14	86.00	31.50	0.00	0.00	117.50
Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty) EA	
Unit values	1.14	90.00	31.50	0.00	0.00	121.50
Totals	0.00	$0	$0	$0	$0	$0
1661309912	SUR FLUOR 2X4' W 3 32W T8				(qty) EA	
Unit values	1.40	115.00	38.50	0.00	0.00	153.50
Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX. 2 13 W PL WALL / CEILING MOUNT				1.00 EA	
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	1.00	$25	$28	$0	$0	$54

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
D16 ELECTRICAL	592	$41,394	$16,218	$0	$0	$57,612
ESTIMATE TOTAL	801	$41,394	$21,951	$0	$0	$63,345
SALES TAX	5.00%	$2,070				
MATL MARKUP	-40.00%	($16,558)				
LABOR MARKUP	-13.40%		($2,941)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$26,906	$19,010	$0	$0	$45,916
CONTINGENCY	10.00%					$4,592
BOND	2.50%					$1,148
PROFIT	10.00%					$4,592
JOB TOTAL						$56,247

Estimate: Bldg. 7210 Date: 6 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
002 SITEWORK	209	$0	$5,733	$0	$0	$5,733
016 ELECTRICAL	592	$41,394	$16,218	$0	$0	$57,612
TOTAL	801	$41,394	$21,951	$0	$0	$63,345
SALES TAX	5.00%	$2,070				
MATL MARKUP	-40.00%	($16,558)				
LABOR MARKUP	-13.40%		($2,941)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$26,906	$19,010	$0	$0	$45,916
CONTINGENCY	10.00%					$4,592
BOND	2.50%					$1,148
PROFIT	10.00%					$4,592
JOB TOTAL						$56,247

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING
12 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7212
AREA: OFFICES/STAIRWELL/BREAK ROOM
AREA USE:
HOURS/DAY 24
DAYS/WEEK 7

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	98 WATTS/FXT =	0 WATTS	0 2 LAMP U @	58 WATTS/FXT =	0 WATTS
4 FOOT			4 FOOT		
21 1 LAMP @	42 WATTS/FXT =	882 WATTS	21 1 LAMP @	29 WATTS/FXT =	609 WATTS
8 2 LAMP @	84 WATTS/FXT =	672 WATTS	8 2 LAMP @	58 WATTS/FXT =	464 WATTS
3 LAMP @	144 WATTS/FXT =	0 WATTS	0 3 LAMP @	87 WATTS/FXT =	0 WATTS
6 4 LAMP @	168 WATTS/FXT =	1008 WATTS	6 4 LAMP @	118 WATTS/FXT =	708 WATTS
8 FOOT			8 FOOT		
2 LAMP @	180 WATTS/FXT =	0 WATTS	0 2 LAMP @	125 WATTS/FXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	22,362 KWH/YR	ECO ENERGY CONSUMPTION	15,359 KWH/YR
	80,574 MJ/YR		56,012 MJ/YR
BASELINE DEMAND	2.56 KW	ECO DEMAND	1.78 KW

NET ENERGY SAVINGS	24,562 MJ/YR	NET DEMAND SAVINGS	$119 /YR
NET ENERGY SAVINGS	23.28 MBTU/YR	NET DOLLAR SAVINGS	$254 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7212
AREA: RESTROOM/OFFICE
LAMP USE:
HOURS/DAY 10
DAYS/WEEK 7
PEAK USE 1 (1-YES, 2-NO)

ELECTRIC COSTS.
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

BUILDING VOLTAGE:

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
6 LAMPS @	52	WATTS =	312 WATTS	6 LAMPS @	13	WATTS =	78 WATTS
LAMPS @	60	WATTS =	0 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	1 LAMPS @	26	WATTS =	26 WATTS
1 LAMPS @	180	WATTS =	100 WATTS				

BASELINE ENERGY CONSUMPTION	*1,589 KWH*	*ECO ENERGY CONSUMPTION*	*379 KWH*
	5,399 MJ		*1,363 MJ*
BASELINE DEMAND	*0.61 KW*	*ECO DEMAND*	*0.10 KW*

NET ENERGY SAVINGS	4,036 MJ/YR	NET DEMAND SAVINGS	$44 /YR
NET ENERGY SAVINGS	3.83 MBTU/YR	NET DOLLAR SAVINGS	$67 /YR

Estimate: Bldg. 7212 Date: 8 July 1994
Description: Control Tower
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					35.00	
Unit values		0.49	0.00	13.35	0.00	0.00	13.3
Totals		16.98	$0	$467	$0	$0	$46
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					7.00	
Unit values		0.26	0.00	7.10	0.00	0.00	7.1
Totals		1.81	$0	$50	$0	$0	$5
U02 SITEWORK		19	$0	$517	$0	$0	$51

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1661302200	SUR FLUOR STRIP 4' W 1 32W LAMP R S					21.00	Ea.	
Unit values		0.94	26.74	22.52	0.00	0.00		49.26
Totals		19.74	$562	$473	$0	$0		$1,035
1661302300	SUR FLUOR STRIP 4' W 2 32W LAMP R S					(qty)	Ea.	
Unit values		1.00	28.65	23.82	0.00	0.00		52.47
Totals		0.00	$0	$0	$0	$0		$0
1661307777	E.E.D. EXIT SIGN SINGLE FACE					(qty)	EA	
Unit values		1.00	185.00	27.50	0.00	0.00		212.50
Totals		0.00	$0	$0	$0	$0		$0
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-C ACRYLIC LENS					(qty)	EA	
Unit values		1.40	89.00	38.50	0.00	0.00		126.50
Totals		0.00	$0	$0	$0	$0		$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.51	84.00	41.50	0.00	0.00		125.50
Totals		0.00	$0	$0	$0	$0		$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00		134.00
Totals		0.00	$0	$0	$0	$0		$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					6.00	EA	
Unit values		1.70	94.00	47.00	0.00	0.00		141.00
Totals		10.20	$564	$282	$0	$0		$846
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					8.00	EA	
Unit values		1.14	73.00	31.50	0.00	0.00		104.50
Totals		9.12	$584	$252	$0	$0		$836
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty)	EA	
Unit values		1.14	86.00	31.50	0.00	0.00		117.50
Totals		0.00	$0	$0	$0	$0		$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					(qty)	EA	
Unit values		1.14	90.00	31.50	0.00	0.00		121.50

Totals	0.00	$0	$0	$0	$0	$0
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				7.00	EA
Unit values	1.00	25.50	27.50	0.00	0.00	53.00
Totals	7.00	$179	$193	$0	$0	$372

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	47	$1,889	$1,200	$0	$0	$3,089
ESTIMATE TOTAL	66	$1,889	$1,717	$0	$0	$3,606
SALES TAX	5.00%	$94				
MATL MARKUP	-40.00%	($756)				
LABOR MARKUP	-13.40%		($230)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,228	$1,487	$0	$0	$2,715
CONTINGENCY	10.00%					$271
BOND	2.50%					$68
PROFIT	10.00%					$271
JOB TOTAL						$3,326

Estimate: Bldg. 7212 Date: 8 July 1994
Description: Control Tower
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C02 SITEWORK	19	$0	$517	$0	$0	$517
C16 ELECTRICAL	47	$1,859	$1,200	$0	$0	$3,089
TOTAL	66	$1,889	$1,717	$0	$0	$3,606
SALES TAX	5.00%	$94				
MATL MARKUP	-40.00%	($756)				
LABOR MARKUP	-13.40%		($230)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,228	$1,487	$0	$0	$2,715
CONTINGENCY	10.00%					$271
BOND	2.50%					$68
PROFIT	10.00%					$271
JOB TOTAL						$3,326

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 1214
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	66 WFIXT =	0 WATTS	0	2 LAMP U @ 58 WFIXT =	0	WATTS
4 FOOT				4 FOOT			
	1 LAMP @	48 WFIXT =	0 WATTS	0	1 LAMP @ 29 WFIXT =	0	WATTS
160	2 LAMP @	84 WFIXT =	13440 WATTS	160	2 LAMP @ 58 WFIXT =	9280	WATTS
5	3 LAMP @	126 WFIXT =	630 WATTS	5	3 LAMP @ 87 WFIXT =	435	WATTS
	4 LAMP @	192 WFIXT =	0 WATTS	0	4 LAMP @ 116 WFIXT =	0	WATTS
8 FOOT				8 FOOT			
	2 LAMP @	100 WFIXT =	0 WATTS	0	2 LAMP @ 125 WFIXT =	0	WATTS

BASELINE ENERGY CONSUMPTION	*51,215*	*KWH/YR*	*ECO ENERGY CONSUMPTION*	*35,363* *KWH/YR*
	184,373	*MJ/YR*		*127,305* *MJ/YR*
BASELINE DEMAND	*14.87*	*KW*	*ECO DEMAND*	*9.72* *KW*

NET ENERGY SAVINGS	57,868 MJ/YR	NET DEMAND SAVINGS	$616 /YR
NET ENERGY SAVINGS	54.86 MBTU/YR	NET DOLLAR SAVINGS	$950 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7214
AREA: RESTROOM
LAMP USE:
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS.
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52	WATTS =	0 WATTS	1 LAMPS @	13	WATTS =	13 WATTS
1 LAMPS @	60	WATTS =	60 WATTS				
LAMPS @	75	WATTS =	0 WATTS	0 LAMPS @	18	WATTS =	0 WATTS
LAMPS @	90	WATTS =	0 WATTS	0 LAMPS @	26	WATTS =	0 WATTS
LAMPS @	150	WATTS =	0 WATTS				

BASELINE ENERGY CONSUMPTION	47 KWH 168 MJ	ECO ENERGY CONSUMPTION	18 KWH 37 MJ
BASELINE DEMAND	0.06 KW	ECO DEMAND	0.01 KW

NET ENERGY SAVINGS	132 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.13 MBTU/YR	NET DOLLAR SAVINGS	$1 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING
19 AUGUST 1994

INTERIOR LIGHTING INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7214
AREA: OFFICE
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE 120

ELECTRIC COSTS
ENERGY CHARGE $0.021 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENTS
2 LAMPS @ 405 WATTS = 810 WATTS

FLUORESCENT FIXTURE REPLACEMENT
1 2 LAMP @ 58 W/FIXT = 58 WATTS

BASELINE ENERGY CONSUMPTION	1,683 KWH 6,065 MJ	ECO ENERGY CONSUMPTION	121 KWH 434 MJ
BASELINE DEMAND	0.81 KW	ECO DEMAND	0.06 KW

NET ENERGY SAVINGS	5,631 MJ/YR	NET DEMAND SAVINGS	$106 /YR
NET ENERGY SAVINGS	5.34 MBTU/YR	NET DOLLAR SAVINGS	$139 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7214

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS
EXIT SIGNS ____
WATTAGE 30

FLUORESCENT EXIT SIGNS
EXIT SIGNS 2
WATTAGE 18

REPLACEMENT FIXTURE
EXIT SIGNS 1
WATTAGE 3

BASELINE ENERGY CONSUMPTION	158 KWH/YR 540 MJ/YR	ECO ENERGY CONSUMPTION	28 KWH/YR 95 MJ/YR
BASELINE DEMAND	0.02 KW	ECO DEMAND	0.003 KW
NET ENERGY SAVINGS	473 MJ/YR	NET DEMAND SAVINGS	$2 /YR
NET ENERGY SAVINGS	0.45 MBTU/YR	NET DOLLAR SAVINGS	$5 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7214
AREA: HANGAR/SHOP BAYS
AREA USE
HOURS/DAY 16
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES

AND @	200	WATTS =	0	WATTS
@	454	WATTS =	10442	WATTS
MV @	1075	WATTS =	193200	WATTS

REPLACEMENT FIXTURES

HPS @	64	WATTS =	0	WATTS
23 MH @	300	WATTS =	6900	WATTS
96 MH @	460	WATTS =	44160	WATTS

BASELINE ENERGY CONSUMPTION	413,657 KWH 1,489,165 MJ	ECO ENERGY CONSUMPTION	103,758 KWH 668,090 MJ
BASELINE DEMAND	113.64 KW	ECO DEMAND	51.06 KW

NET ENERGY SAVINGS	820,875 MJ/YR	NET DEMAND SAVINGS	$8,847 /YR
NET ENERGY SAVINGS	777.26 MBTU/YR	NET DOLLAR SAVINGS	$13,653 /YR

Estimate: Bldg. 7214 Date: 8 July 1994
Description: Hanger
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082119	DEMO, 2x2, 1x4 FLUOR FIXTURES					160.00	
	Unit values	0.36	0.00	10.00	0.00	0.00	10.00
	Totals	58.24	$0	$1,600	$0	$0	$1,600
0207082121	DEMO, 2x4 FLUOR FIXTURES					5.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	2.43	$0	$67	$0	$0	$67
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					4.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	1.03	$0	$28	$0	$0	$28
0207082540	DEMO, HIGH BAY FIXTURES					119.00	
	Unit values	1.00	0.00	27.50	0.00	0.00	27.50
	Totals	119.00	$0	$3,273	$0	$0	$3,273
0207	SITEWORK	181	$0	$4,968	$0	$0	$4,968

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661304291	HIGH BAY, AL REFLECTOR 400W MH					96.00	EA
	Unit values	3.48	295.00	95.50	0.00	0.00	390.50
	Totals	333.89	$28,320	$9,168	$0	$0	$37,488
1661304292	HIGH BAY, AL REFLECTOR 250W MH					23.00	EA
	Unit values	3.48	243.00	95.50	0.00	0.00	338.50
	Totals	79.99	$5,589	$2,197	$0	$0	$7,786
1661307777	L.E.D. EXIT SIGN SINGLE FACE					1.00	EA
	Unit values	1.00	50.00	27.50	0.00	0.0	77.50
	Totals	1.00	$50	$28	$0	$0	$78
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty)	EA
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50

Totals	0.00	$0	$0	$0	$0	$
1661309909	SUR FLUOR 1X4' W 2 32W T8					
					106.00	EA
Unit values	1.14	66.00	31.50	0.00	0.00	117.5
Totals	120.84	$9,116	$3,339	$0	$0	$12,45
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					
					55.00	EA
Unit values	1.14	60.00	31.50	0.00	0.00	91.5
Totals	62.70	$3,300	$1,733	$0	$0	$5,03
1661309912	SUR FLUOR 2X4' W 3 32W T8					
					5.00	EA
Unit values	1.40	115.00	38.50	0.00	0.00	153.5
Totals	7.00	$575	$193	$0	$0	$76
1661328041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY					
					(qty)	EA
Unit values	0.13	14.50	3.44	0.00	0.00	17.9
Totals	0.00	$0	$0	$0	$0	$
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT					
					1.00	EA
Unit values	1.00	25.50	27.50	0.00	0.00	53.0
Totals	1.00	$26	$28	$0	$0	$5

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL		607	$46,976	$16,686	$0	$0	$63,6
ESTIMATE TOTAL		788	$46,976	$21,654	$0	$0	$68,6
	SALES TAX	5.00%	$2,349				
	MATL MARKUP	-40.00%	($18,790)				
	LABOR MARKUP	-13.40%		($2,902)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$30,534	$18,752	$0	$0	$49,2
	CONTINGENCY	10.00%					$4,9
	BOND	2.50%					$1,2
	PROFIT	10.00%					$4,9
JOB TOTAL							$60,3

Estimate: Bldg. 7214 Date: 8 July 1994
Description: Hanger
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
002 SITEWORK	181	$0	$4,965	$0	$0	$4,96
016 ELECTRICAL	607	$46,976	$16,686	$0	$0	$63,66
TOTAL	788	$46,976	$21,654	$0	$0	$68,63
SALES TAX	5.00%	$2,349				
MATL MARKUP	-40.00%	($18,790)				
LABOR MARKUP	-13.40%		($2,902)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$30,534	$18,752	$0	$0	$49,28
CONTINGENCY	10.00%					$4,9
BOND	2.50%					$1,2
PROFIT	10.00%					$4,9
JOB TOTAL						$60,3

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

18 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7218
AREA: ENTIRE BLDG
AREA USE
HOURS/DAY 14
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
	2 LAMP U	96 W/FIXT =	0 WATTS	0	2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP @	48 W/FIXT =	0 WATTS	0	1 LAMP @	29 W/FIXT =	0 WATTS
201	2 LAMP @	84 W/FIXT =	16884 WATTS	201	2 LAMP @	58 W/FIXT =	11658 WATTS
16	3 LAMP @	126 W/FIXT =	2016 WATTS	16	3 LAMP @	87 W/FIXT =	1392 WATTS
	4 LAMP @	192 W/FIXT =	0 WATTS	0	4 LAMP @	116 W/FIXT =	0 WATTS
8 FOOT				8 FOOT			
	2 LAMP @	160 W/FIXT =	0 WATTS	0	2 LAMP @	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION			68,756 KWH/YR 247,666 MJ/YR	ECO ENERGY CONSUMPTION			47,502 KWH/YR 171,007 MJ/YR
BASELINE DEMAND			18.90 KW	ECO DEMAND			13.05 KW

NET ENERGY SAVINGS	76,658 MJ/YR	NET DEMAND SAVINGS	$927 /YR
NET ENERGY SAVINGS	72.66 MBTU/YR	NET DOLLAR SAVINGS	$1,276 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7218
AREA: RESTROOM
LAMP USE:
HOURS/DAY 3
DAYS/WEEK 5
PEAK USE 2 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS					COMPACT FLUORESCENT REPLACEMENT				
0	LAMPS @	52	WATTS =	0 WATTS	1	LAMPS @	13	WATTS =	13 WATTS
1	LAMPS @	60	WATTS =	60 WATTS					
0	LAMPS @	75	WATTS =	0 WATTS	0	LAMPS @	18	WATTS =	0 WATTS
0	LAMPS @	90	WATTS =	0 WATTS	0	LAMPS @	26	WATTS =	0 WATTS
0	LAMPS @	100	WATTS =	0 WATTS					

BASELINE ENERGY CONSUMPTION	47 KWH 169 MJ	ECO ENERGY CONSUMPTION	10 KWH 37 MJ
BASELINE DEMAND	0.06 KW	ECO DEMAND	0.01 KW

NET ENERGY SAVINGS	132 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	0.13 MBTU/YR	NET DOLLAR SAVINGS	$1 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7218
AREA: OFFICE
LAMP USE
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 120

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING INCANDESCENTS
2 LAMPS @ 405 WATTS = 810 WATTS

FLUORESCENT FIXTURE REPLACEMENT
1 2 LAMP @ 58 W/FIXT = 58 WATTS

BASELINE ENERGY CONSUMPTION	7,085 KWH 6,085 MJ	ECO ENERGY CONSUMPTION	121 KWH 434 MJ
BASELINE DEMAND	0.81 KW	ECO DEMAND	0.06 KW

NET ENERGY SAVINGS	5,631 MJ/YR	NET DEMAND SAVINGS	$106 /YR
NET ENERGY SAVINGS	5.34 MBTU/YR	NET DOLLAR SAVINGS	$139 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7219

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS		# EXIT SIGNS	3	# EXIT SIGNS	3
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	473 KWH/YR 1,703 MJ/YR	ECO ENERGY CONSUMPTION	79 KWH/YR 284 MJ/YR
BASELINE DEMAND	0.05 KW	ECO DEMAND	0.009 KW

NET ENERGY SAVINGS	1,419 MJ/YR	NET DEMAND SAVINGS	$6 /YR
NET ENERGY SAVINGS	1.35 MBTU/YR	NET DOLLAR SAVINGS	$15 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7218
AREA: HANGAR/SHOP BAYS
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 277

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACMENT FIXTURES			
INCAND @	200	WATTS = 0	WATTS	HPS @	64	WATTS = 0	WATTS
28 MV @	454	WATTS = 12712	WATTS	28 MH @	300	WATTS = 8400	WATTS
96 MV @	1075	WATTS = 103200	WATTS	96 MH @	460	WATTS = 44160	WATTS

BASELINE ENERGY CONSUMPTION	421,929 KWH 1,518,911 MJ	ECO ENERGY CONSUMPTION	191,318 KWH 688,746 MJ
BASELINE DEMAND	115.91 KW	ECO DEMAND	52.56 KW

NET ENERGY SAVINGS	830,165 MJ/YR	NET DEMAND SAVINGS	$8,955 /YR
NET ENERGY SAVINGS	786.81 MBTU/YR	NET DOLLAR SAVINGS	$13,821 /YR

Estimate: Bldg. 7218 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082119	DEMO, 2x2, 1x4 FLUOR FIXTURES					201.00	
	Unit values	0.36	0.00	10.00	0.00	0.00	10.00
	Totals	73.16	$0	$2,010	$0	$0	$2,010
0207082121	DEMO, 2x4 FLUOR FIXTURES					16.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	7.76	$0	$214	$0	$0	$214
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					6.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	1.55	$0	$43	$0	$0	$43
0207082540	DEMO, HIGH BAY FIXTURES					124.00	
	Unit values	1.00	0.00	27.50	0.00	0.00	27.50
	Totals	124.00	$0	$3,410	$0	$0	$3,410
U02	SITEWORK	207	$0	$5,677	$0	$0	$5,677

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R.S					(qty) Ea.	
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R.S					(qty) Ea.	
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661304291	HIGH BAY, AL REFLECTOR 400W MH					96.00 EA	
	Unit values	3.48	295.00	95.50	0.00	0.00	390.50
	Totals	333.89	$28,320	$9,168	$0	$0	$37,488
1661304292	HIGH BAY, AL REFLECTOR 250W MH					28.00 EA	
	Unit values	3.48	243.00	95.50	0.00	0.00	338.50
	Totals	97.38	$6,804	$2,674	$0	$0	$9,478
1661307777	L.E.D. EXIT SIGN SINGLE FACE					3.00 EA	
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	3.00	$150	$83	$0	$0	$233
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					0.00 EA	
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50

Totals	0.00	$0	$0	$0	$0		$0
1661309909	SUR FLUOR 1X4' W 2 32W T8				114.00	EA	
Unit values	1.14	86.00	31.50	0.00	0.00		117.50
Totals	129.96	$9,804	$3,591	$0	$0		$13,395
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				88.00	EA	
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	100.32	$5,280	$2,772	$0	$0		$8,052
1661309912	SUR FLUOR 2X4' W 3 32W T8				16.00	EA	
Unit values	1.40	115.00	38.50	0.00	0.00		153.50
Totals	22.40	$1,840	$616	$0	$0		$2,456
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty)	EA	
Unit values	0.13	14.50	3.44	0.00	0.00		17.94
Totals	0.00	$0	$0	$0	$0		$0
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				1.00	EA	
Unit values	1.00	25.50	27.50	0.00	0.00		53.00
Totals	1.00	$26	$28	$0	$0		$54

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	669	$52,224	$18,932	$0	$0	$71,156
ESTIMATE TOTAL	695	$52,224	$24,609	$0	$0	$76,833
SALES TAX	5.00%	$2,611				
MATL MARKUP	-40.00%	($20,890)				
LABOR MARKUP	-13.40%		($3,298)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$33,946	$21,311	$0	$0	$55,257
CONTINGENCY	10.00%					$5,526
BOND	2.50%					$1,381
PROFIT	10.00%					$5,526
JOB TOTAL						$67,690

Estimate: Bldg. 7218 Date: 6 July 1994
Description: Hanger
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
UC2 SITEWORK	207	$0	$5,677	$0	$0	$5,677
U16 ELECTRICAL	688	$52,224	$18,932	$0	$0	$71,156
TOTAL	895	$52,224	$24,609	$0	$0	$76,833
SALES TAX	5.00%	$2,611				
MATL MARKUP	-40.00%	($20,890)				
LABOR MARKUP	-13.40%		($3,298)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$33,946	$21,311	$0	$0	$55,257
CONTINGENCY	10.00%					$5,526
BOND	2.50%					$1,381
PROFIT	10.00%					$5,526
JOB TOTAL						$67,690

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

EXTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 724 J
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT			
0	2 LAMP U @	98 W/FIXT =	0 WATTS
4 FOOT			
0	1 LAMP @	48 W/FIXT =	0 WATTS
55	2 LAMP @	64 W/FIXT =	7380 WATTS
0	3 LAMP @	144 W/FIXT =	0 WATTS
0	4 LAMP @	192 W/FIXT =	0 WATTS
8 FOOT			
0	2 LAMP @	160 W/FIXT =	0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT			
0	2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT			
0	1 LAMP @	29 W/FIXT =	0 WATTS
95	2 LAMP @	58 W/FIXT =	5510 WATTS
0	3 LAMP @	87 W/FIXT =	0 WATTS
0	4 LAMP @	116 W/FIXT =	0 WATTS
8 FOOT			
0	2 LAMP @	125 W/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	*39,947*	*KWH/YR*	*ECO ENERGY CONSUMPTION*	*20,856*	*KWH/YR*
	144,579	*MJ/YR*		*72,203*	*MJ/YR*
BASELINE DEMAND	*7.98*	*KW*	*ECO DEMAND*	*5.51*	*KW*

NET ENERGY SAVINGS	32,367 KWH/YR	NET DEMAND SAVINGS	$349 /YR
NET ENERGY SAVINGS	30.58 MBTU/YR	NET DOLLAR SAVINGS	$539 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7243

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS		# EXIT SIGNS	2	# EXIT SIGNS	2
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	*315 KWH/YR*	*ECO ENERGY CONSUMPTION*	*83 KWH/YR*
	1,135 MJ/YR		*189 MJ/YR*
BASELINE DEMAND	*0.04 KW*	*ECO DEMAND*	*0.01 KW*

NET ENERGY SAVINGS	946 MJ/YR	NET DEMAND SAVINGS	$4 /YR
NET ENERGY SAVINGS	0.90 MBTU/YR	NET DOLLAR SAVINGS	$10 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7243
AREA:
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2 NO)

ELECTRIC COSTS:
ENERGY CHARGE: $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

BUILDING VOLTAGE 277

EXISTING FIXTURES				REPLACMENT FIXTURES			
INCAND @	200	WATTS	0 WATTS	0 HPS @	64	WATTS	0 WATTS
MV @	454	WATTS	0 WATTS	0 MH @	300	WATTS	0 WATTS
120 MV @	1075	WATTS	129000 WATTS	120 MH @	460	WATTS	55200 WATTS

BASELINE ENERGY CONSUMPTION	*469,560 KWH*	*ECO ENERGY CONSUMPTION*	*200,928 KWH*
	1,690,416 MJ		*723,341 MJ*
BASELINE DEMAND	*129.00 KW*	*ECO DEMAND*	*55.20 KW*

NET ENERGY SAVINGS	967,875 MJ/YR	NET DEMAND SAVINGS	$10,432 /YR
NET ENERGY SAVINGS	916.57 MBTU/YR	NET DOLLAR SAVINGS	$16,101 /YR

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FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

EXTERIOR LIGHTING REPLACEMENT

BUILDING #: 7243

AREA USE:
HOURS/YR 4400

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACMENT FIXTURES			
9 SIGNAL @	100	WATTS =	900 WATTS	9 HPS @	46	WATTS =	414 WATTS
QUARTZ @	200	WATTS =	0 WATTS	0 HPS @	46	WATTS =	0 WATTS
MV @	454	WATTS =	0 WATTS	0 HPS @	188	WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	3,960 KWH 14,256 MJ	ECO ENERGY CONSUMPTION	1,822 KWH 6,559 MJ
BASELINE DEMAND	0.90 KW	ECO DEMAND	0.41 KW

NET ENERGY SAVINGS 7,696 MJ/YR
NET ENERGY SAVINGS 7.30 MBTU/YR
NET DOLLAR SAVINGS $46 /YR

Estimate: Bldg. 7243 Date: 8 July 1994
Description: Hanger
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description / Manhours	Matl	Labor	Equipment	Sub	Total
0207082119	DEMO, 2x2, 1x4 FLUOR FIXTURES				10.00	
Unit values	0.36	0.00	10.00	0.00	0.00	10.00
Totals	3.64	$0	$100	$0	$0	$100
0207082121	DEMO, 2x4 FLUOR FIXTURES				85.00	
Unit values	0.49	0.00	13.35	0.00	0.00	13.35
Totals	41.23	$0	$1,135	$0	$0	$1,135
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS				11.00	
Unit values	0.26	0.00	7.10	0.00	0.00	7.10
Totals	2.84	$0	$78	$0	$0	$78
0207082540	DEMO, HIGH BAY FIXTURES				120.00	
Unit values	1.00	0.00	27.50	0.00	0.00	27.50
Totals	120.00	$0	$3,300	$0	$0	$3,300
U02 SITEWORK	168	$0	$4,613	$0	$0	$4,613

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 40W LAMP R S					(qty)	Ea.
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	0.00	$0	$0	$0	$0	$0
1661302300	SUR FLUOR STRIP 4' W 2 40W LAMP R S					(qty)	Ea.
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661304289	EXTERIOR 35W HPS WALL PACK					9.00	EA
	Unit values	1.00	75.00	27.50	0.00	0.00	102.50
	Totals	9.00	$675	$248	$0	$0	$923
1661304291	HIGH BAY, AL REFLECTOR 400W MH					120.00	EA
	Unit values	3.48	295.00	95.50	0.00	0.00	390.50
	Totals	417.36	$35,400	$11,460	$0	$0	$46,860
1661307777	L.E.D. EXIT SIGN SINGLE FACE					2.00	EA
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	2.00	$100	$55	$0	$0	$155
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty)	EA
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					79.00	EA
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	119.29	$6,636	$3,279	$0	$0	$9,915
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					(qty)	EA
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50

Totals	0.00	$0	$0	$0	$0	$0
1661309909	SUR FLUOR 1X4' W 2 32W T8					
					0.00 EA	
Unit values	1.14	86.00	31.50	0.00	0.00	117.50
Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR					
					10.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	11.40	$600	$315	$0	$0	$915
1661309911	SUR FLUOR 2X4' W 2 32W T8					
					6.00 EA	
Unit values	1.29	95.00	35.50	0.00	0.00	130.50
Totals	7.74	$570	$213	$0	$0	$783
1661388041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY					
					(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
016	ELECTRICAL	567	$43,981	$15,570	$0	$0	$59,551
	ESTIMATE TOTAL	735	$43,981	$20,183	$0	$0	$64,164
	SALES TAX	5.00%	$2,199				
	MATL MARKUP	-40.00%	($17,592)				
	LABOR MARKUP	-13.40%		($2,705)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
	TOTAL BEFORE CONTINGENC		$28,588	$17,478	$0	$0	$46,066
	CONTINGENCY	10.00%					$4,607
	BOND	2.50%					$1,152
	PROFIT	10.00%					$4,607
	JOB TOTAL						$56,431

Estimate: Bldg. 7243 Date: 8 July 1994
Description: Hanger
Project: Lightning Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C02 SITEWORK	168	$0	$4,613	$0	$0	$4,613
C16 ELECTRICAL	567	$43,981	$15,570	$0	$0	$59,551
TOTAL	735	$43,981	$20,183	$0	$0	$64,164
SALES TAX	5.00%	$2,199				
MATL MARKUP	-40.00%	($17,592)				
LABOR MARKUP	-13.40%		($2,705)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$28,588	$17,478	$0	$0	$46,066
CONTINGENCY	10.00%					$4,607
BOND	2.50%					$1,152
PROFIT	10.00%					$4,607
JOB TOTAL						$56,431

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7245
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.76 PER KW

EXISTING FIXTURE DATA

2 FOOT
0 2 LAMP U @ 96 W/FIXT = 0 WATTS

4 FOOT
92 1 LAMP @ 42 W/FIXT = 3864 WATTS
285 2 LAMP @ 84 W/FIXT = 24024 WATTS
19 3 LAMP @ 126 W/FIXT = 2394 WATTS
0 4 LAMP @ 192 W/FIXT = 0 WATTS

8 FOOT
0 2 LAMP @ 189 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 116,226 KWH/YR
396,815 MJ/YR
BASELINE DEMAND 30.26 KW

REPLACEMENT FIXTURE DATA

2 FOOT
0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT
92 1 LAMP @ 29 W/FIXT = 2668 WATTS
285 2 LAMP @ 58 W/FIXT = 16588 WATTS
19 3 LAMP @ 87 W/FIXT = 1653 WATTS
0 4 LAMP @ 116 W/FIXT = 0 WATTS

8 FOOT
0 2 LAMP @ 125 W/FIXT = 0 WATTS

ECO ENERGY CONSUMPTION 78,109 KWH/YR
273,992 MJ/YR
ECO DEMAND 20.91 KW

NET ENERGY SAVINGS 122,824 MJ/YR
NET ENERGY SAVINGS 116.41 MBTU/YR
NET DEMAND SAVINGS $1,325 /YR
NET DOLLAR SAVINGS $2,845 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

13 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7245
AREA: OFFICE
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS		FLUORESCENT FIXTURE REPLACEMENT	
2 LAMPS @ 750 WATTS = 1500 WATTS		1 2 LAMP @ 58 W/FIXT =	58 WATTS
BASELINE ENERGY CONSUMPTION	*3,120 KWH*	*ECO ENERGY CONSUMPTION*	*121 KWH*
	11,232 MJ		*434 MJ*
BASELINE DEMAND	*1.50 KW*	*ECO DEMAND*	*0.06 KW*

NET ENERGY SAVINGS	10,798 MJ/YR	NET DEMAND SAVINGS	$284 /YR
NET ENERGY SAVINGS	10.23 MBTU/YR	NET DOLLAR SAVINGS	$267 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING
13 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7245

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS		# EXIT SIGNS	11	# EXIT SIGNS	11
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	*1,734 KWH/YR*	*ECO ENERGY CONSUMPTION*	*289 KWH/YR*
	6,246 MJ/YR		*1,041 MJ/YR*
BASELINE DEMAND	*0.30 KW*	*ECO DEMAND*	*0.03 KW*

NET ENERGY SAVINGS	5,203 MJ/YR	NET DEMAND SAVINGS	$23 /YR
NET ENERGY SAVINGS	4.93 MBTU/YR	NET DOLLAR SAVINGS	$54 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

18 AUGUST 1994

BUILDING #: 7243
AREA: HANGAR BAY
AREA USE.
HOURS/DAY 14
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 277

ELECTRIC COSTS.
ENERGY CHARGE $0.02[illegible] PER KWH
DEMAND CHARGE $11.28 PER KW

EXISTING FIXTURES				REPLACMENT FIXTURES			
INCAND @	200	WATTS =	0 WATTS	0 HPS @	64	WATTS =	0 WATTS
MV @	454	WATTS =	0 WATTS	MH @	300	WATTS =	0 WATTS
70 MV @	1075	WATTS =	75250 WATTS	70 MH @	460	WATTS =	32200 WATTS

BASELINE ENERGY CONSUMPTION	*273,919 KWH*	*ECO ENERGY CONSUMPTION*	*117,208 KWH*
	986,076 MJ		*421,948 MJ*
BASELINE DEMAND	*75.25 KW*	*ECO DEMAND*	*32.20 KW*

NET ENERGY SAVINGS	564,127 MJ/YR	NET DEMAND SAVINGS	$6,086 /YR
NET ENERGY SAVINGS	534.67 MBTU/YR	NET DOLLAR SAVINGS	$9,392 /YR

Estimate: Bldg. 7245 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					397.00	
Unit values		0.49	0.00	13.35	0.00	0.00	13.35
Totals		192.55	$0	$5,300	$0	$0	$5,300
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					13.00	
Unit values		0.26	0.00	7.10	0.00	0.00	7.10
Totals		3.35	$0	$92	$0	$0	$92
0207082540	DEMO, HIGH BAY FIXTURES					70.00	
Unit values		1.00	0.00	27.50	0.00	0.00	27.50
Totals		70.00	$0	$1,925	$0	$0	$1,925
002 SITEWORK		266	$0	$7,317	$0	$0	$7,317

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 32W LAMP R S					92.00 Ea.	
Unit values		0.94	26.74	22.52	C.OC	0.00	49.26
Totals		66.57	$2,460	$2,[illegible]	$0	$0	$4,531
1661302300	SUR FLUOR STRIP 4' W 2 32W LAMP R S					(qty) Ea.	
Unit values		1.00	28.65	23.82	C.OC	0.00	52.47
Totals		0.00	$0	$0	$0	$0	$0
1661304291	HIGH BAY, AL REFLECTOR 400W MH					70.00 EA	
Unit values		3.48	295.00	95.50	C.OC	0.00	390.50
Totals		243.46	$20,650	$6,695	$0	$0	$27,355
1661307777	L.E.D. EXIT SIGN SINGLE FACE					11.00 EA	
Unit values		1.00	50.00	27.50	C.00	0.00	77.50
Totals		11.00	$550	$303	$0	$0	$853
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
Unit values		1.40	88.00	38.50	0.00	0.00	126.50
Totals		0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		1.51	84.00	41.50	0.00	0.00	125.50
Totals		0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		1.60	90.00	44.00	0.00	0.00	134.00
Totals		0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
Unit values		1.70	94.00	47.00	0.00	0.00	141.00
Totals		0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					165.00 EA	
Unit values		1.14	73.00	31.50	0.00	0.00	104.50
Totals		188.10	$12,045	$5,198	$0	$0	$17,243
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty) EA	
Unit values		1.14	86.00	31.50	0.00	0.00	117.50

Totals	0.00	$0	$0	$0	$0	
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				122.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.
Totals	139.08	$7,320	$3,843	$0	$0	$11,1
1661309917	SUR FLUOR 2X4' W 3 32W T8				19.00 EA	
Unit values	1.40	115.00	38.50	0.00	0.00	153.
Totals	26.60	$2,185	$732	$0	$0	$2,9
1661368041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.
Totals	0.00	$0	$0	$0	50	

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	695	$45,210	$18,832	$0	$0	$64,0
ESTIMATE TOTAL	961	$45,210	$26,149	$0	$0	$71,3
SALES TAX	5.00%	$2,261				
MATL MARKUP	-40.00%	($18,084)				
LABOR MARKUP	-13.40%		($3,504)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$29,387	$22,645	$0	$0	$52,0
CONTINGENCY	10.00%					$5,2
BOND	2.50%					$1,3
PROFIT	10.00%					$5,2
JOB TOTAL						$63,7

Estimate: Bldg. 7245 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
002 SITEWORK	266	$0	$7,317	$0	$0	$7,31
016 ELECTRICAL	695	$45,210	$18,832	$0	$0	$64,04
TOTAL	961	$45,210	$26,149	$0	$0	$71,35
SALES TAX	5.00%	$2,261				
MATL MARKUP	-40.00%	($18,084)				
LABOR MARKUP	-13.40%		($3,504)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$29,387	$22,645	$0	$0	$52,03
CONTINGENCY	10.00%					$5,20
BOND	2.50%					$1,30
PROFIT	10.00%					$5,20
JOB TOTAL						$63,73

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7249
AREA: ENTIRE BLDG
AREA USE:
HOURS/DAY 14
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.76 PER KW

EXISTING FIXTURE DATA			REPLACEMENT FIXTURE DATA		
2 FOOT			2 FOOT		
2 LAMP U	96 WATTS/FIXT =	0 WATTS	0 2 LAMP U @	58 WATTS/FIXT =	0 WATTS
4 FOOT			4 FOOT		
92 1 LAMP @	42 WATTS/FIXT =	3864 WATTS	92 1 LAMP @	29 WATTS/FIXT =	2668 WATTS
286 2 LAMP @	84 WATTS/FIXT =	24024 WATTS	286 2 LAMP @	58 WATTS/FIXT =	16588 WATTS
19 3 LAMP @	126 WATTS/FIXT =	2394 WATTS	19 3 LAMP @	87 WATTS/FIXT =	1653 WATTS
4 LAMP @	192 WATTS/FIXT =	0 WATTS	0 4 LAMP @	116 WATTS/FIXT =	0 WATTS
8 FOOT			8 FOOT		
2 LAMP @	160 WATTS/FIXT =	0 WATTS	0 2 LAMP @	125 WATTS/FIXT =	0 WATTS

BASELINE ENERGY CONSUMPTION	110,226	KWH/YR	ECO ENERGY CONSUMPTION	78,179	KWH/YR
	396,815	MJ/YR		273,992	MJ/YR
BASELINE DEMAND	30.26	KW	ECO DEMAND	20.91	KW

NET ENERGY SAVINGS	122,824 MJ/YR	NET DEMAND SAVINGS	$1,325 /YR
NET ENERGY SAVINGS	116.41 MBTU/YR	NET DOLLAR SAVINGS	$2,045 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 7249
AREA: OFFICE
LAMP USE:
HOURS/DAY 8
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAG 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

EXISTING INCANDESCENTS
2 LAMPS @ 750 WATTS = 1500 WATTS

FLUORESCENT FIXTURE REPLACEMENT
1 2 LAMP @ 58 W/FIXT = 58 WATTS

BASELINE ENERGY CONSUMPTION	*3,120 KWH*	*ECO ENERGY CONSUMPTION*	*121 KWH*
	11,232 MJ		*434 MJ*
BASELINE DEMAND	*1.50 KW*	*ECO DEMAND*	*0.06 KW*

NET ENERGY SAVINGS	10,798 MJ/YR	NET DEMAND SAVINGS	$204 /YR
NET ENERGY SAVINGS	10.23 MBTU/YR	NET DOLLAR SAVINGS	$267 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7249

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS		# EXIT SIGNS	11	# EXIT SIGNS	11
WATTAGE	30	WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	*1,734 KWH/YR*	*ECO ENERGY CONSUMPTION*	*289 KWH/YR*
	6,244 MJ/YR		*1,041 MJ/YR*
BASELINE DEMAND	*0.20 KW*	*ECO DEMAND*	*0.03 KW*

NET ENERGY SAVINGS	5,203 MJ/YR	NET DEMAND SAVINGS	$23 /YR
NET ENERGY SAVINGS	4.93 MBTU/YR	NET DOLLAR SAVINGS	$54 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

BUILDING #: 7249
AREA: HANGAR BAY
AREA USE.
HOURS/DAY 14
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2-NO)

BUILDING VOLTAGE: 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURES				REPLACEMENT FIXTURES			
INCAND @	200	WATTS =	0 WATTS	0 HPS @	84	WATTS =	0 WATTS
MV @	454	WATTS =	0 WATTS	MH @	300	WATTS =	0 WATTS
70 MV @	1075	WATTS =	75250 WATTS	70 MH @	460	WATTS =	32200 WATTS

BASELINE ENERGY CONSUMPTION	772,919 KWH 996,675 MJ	ECO ENERGY CONSUMPTION	117,208 KWH 421,949 MJ
BASELINE DEMAND	75.25 KW	ECO DEMAND	32.20 KW

NET ENERGY SAVINGS	564,127 KWH/YR	NET DEMAND SAVINGS	$6,696 /YR
NET ENERGY SAVINGS	534.67 MBTU/YR	NET DOLLAR SAVINGS	$9,392 /YR

Estimate: Bldg. 7249 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					397.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	192.55	$0	$5,300	$0	$0	$5,300
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					13.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	3.35	$0	$92	$0	$0	$92
0207082540	DEMO, HIGH BAY FIXTURES					70.00	
	Unit values	1.00	0.00	27.50	0.00	0.00	27.50
	Totals	70.00	$0	$1,925	$0	$0	$1,925
02	UC2 SITEWORK	266	$0	$7,317	$0	$0	$7,317

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661302200	SUR FLUOR STRIP 4' W 1 32W LAMP R S					92.00 EA.	
	Unit values	0.94	26.74	22.52	0.00	0.00	49.26
	Totals	86.57	$2,460	$2,071	$0	$0	$4,531
1661302300	SUR FLUOR STRIP 4' W 2 32W LAMP R S					(qty) Ea.	
	Unit values	1.00	28.65	23.82	0.00	0.00	52.47
	Totals	0.00	$0	$0	$0	$0	$0
1661304291	HIGH BAY, AL REFLECTOR 400W MH					70.00 EA	
	Unit values	3.48	295.00	95.50	0.00	0.00	390.50
	Totals	243.46	$20,650	$6,685	$0	$0	$27,335
1661307707	L.E.D. EXIT SIGN SINGLE FACE					11.00 EA	
	Unit values	1.00	50.00	27.50	0.00	0.00	77.50
	Totals	11.00	$550	$303	$0	$0	$853
1661309801	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS					(qty) EA	
	Unit values	1.40	88.00	38.50	0.00	0.00	126.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309802	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.51	84.00	41.50	0.00	0.00	125.50
	Totals	0.00	$0	$0	$0	$0	$0
1661309803	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.60	90.00	44.00	0.00	0.00	134.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309804	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS					(qty) EA	
	Unit values	1.70	94.00	47.00	0.00	0.00	141.00
	Totals	0.00	$0	$0	$0	$0	$0
1661309807	REC FLUOR TROFFER 1X4' W 2 32W T8 ACRYLIC LENS					165.00 EA	
	Unit values	1.14	73.00	31.50	0.00	0.00	104.50
	Totals	188.10	$12,045	$5,198	$0	$0	$17,243
1661309909	SUR FLUOR 1X4' W 2 32W T8					(qty) EA	
	Unit values	1.14	86.00	31.50	0.00	0.00	117.50

Totals	0.00	$0	$0	$0	$0	$0
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				122.00 EA	
Unit values	1.14	60.00	31.50	0.00	0.00	91.50
Totals	139.08	$7,320	$3,843	$0	$0	$11,163
1661309912	SUR FLUOR 2X4' W 3 [illegible] 8				19.00 EA	
Unit values	1.40	115.00	38.50	0.00	0.00	153.50
Totals	26.60	$2,185	$732	$0	$0	$2,917
1661366041	COMP FLUOR LAMP, 18 W TWIN TUBE GLOBE ASSEMBLY				(qty) EA	
Unit values	0.13	14.50	3.44	0.00	0.00	17.94
Totals	0.00	$0	$0	$0	$0	$0

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	696	$45,210	$18,832	$0	$0	$64,042
ESTIMATE TOTAL	961	$45,210	$26,149	$0	$0	$71,359
SALES TAX	5.00%	$2,261				
MATL MARKUP	-40.00%	($18,084)				
LABOR MARKUP	-13.40%		($3,504)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$29,387	$22,645	$0	$0	$52,032
CONTINGENCY	10.00%					$5,203
BOND	2.50%					$1,301
PROFIT	10.00%					$5,203
JOB TOTAL						$63,739

Estimate: Bldg. 7249 Date: 8 July 1994
Description: Hangar
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	266	$0	$7,317	$0	$0	$7,317
U16 ELECTRICAL	695	$45,210	$18,832	$0	$0	$64,042
TOTAL	961	$45,210	$26,149	$0	$0	$71,359
SALES TAX	5.00%	$2,261				
MATL MARKUP	-40.00%	($18,084)				
LABOR MARKUP	-13.40%		($3,504)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$29,387	$22,645	$0	$0	$52,032
CONTINGENCY	10.00%					$5,203
BOND	2.50%					$1,301
PROFIT	10.00%					$5,203
JOB TOTAL						$63,739

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7281
AREA: TIRE BLDG
AREA USE
HOURS/DAY 10
DAYS/WEEK 5

BUILDING VOLTAGE 120

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
2	2 LAMP U	86 W/FIXT =	0 WATTS	0	2 LAMP U @	58 W/FIXT =	0 WATTS
4 FOOT				4 FOOT			
	1 LAMP @	46 W/FIXT =	0 WATTS	0	1 LAMP @	29 W/FIXT =	0 WATTS
4	2 LAMP @	90 W/FIXT =	360 WATTS	4	1 LAMP @ W/REFLECTOR	29 W/FIXT =	116 WATTS
	3 LAMP @	144 W/FIXT =	0 WATTS	0	3 LAMP @	87 W/FIXT =	0 WATTS
112	4 LAMP @	180 W/FIXT =	20160 WATTS	112	2 LAMP @ W/REFLECTOR	58 W/FIXT =	6496 WATTS
8 FOOT				8 FOOT			
	2 LAMP @	19 W/FIXT =	0 WATTS	0	2 LAMP @	125 W/FIXT =	0 WATTS
BASELINE ENERGY CONSUMPTION			53,382 KWH/YR 192,057 MJ/YR	ECO ENERGY CONSUMPTION			17,191 KWH/YR 61,869 MJ/YR
BASELINE DEMAND			20.53 KW	ECO DEMAND			6.61 KW

NET ENERGY SAVINGS 130,179 MJ/YR
NET ENERGY SAVINGS 123.38 MBTU/YR

NET DEMAND SAVINGS $1,366 /YR
NET DOLLAR SAVINGS $2,729 /YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR/EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7281

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT FIXTURE	
# EXIT SIGNS	5	# EXIT SIGNS		# EXIT SIGNS	5
WATTAGE		WATTAGE	18	WATTAGE	3

BASELINE ENERGY CONSUMPTION	1,752 KWH/YR 6,307 MJ/YR	ECO ENERGY CONSUMPTION	131 KWH/YR 473 MJ/YR
BASELINE DEMAND	0.20 KW	ECO DEMAND	0.02 KW

NET ENERGY SAVINGS	5,834 MJ/YR	NET DEMAND SAVINGS	$26 /YR
NET ENERGY SAVINGS	5.53 MBTU/YR	NET DOLLAR SAVINGS	$60 /YR

Estimate:	Bldg. 7281	Date:	8 July 1994
Description:	Storage / Admin		
Project:	Lighting Study	Bid Date:	
Location:	Ft. Campbell	Job #:	
Sq. footage:		City Indx:	

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082121	DEMO, 2x4 FLUOR FIXTURES					116.00	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.3
	Totals	56.28	$0	$1,549	$0	$0	$1,54
0207082123	DEMO, INCAND FIXTURES / EXIT SIGNS					5.00	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.1
	Totals	1.29	$0	$36	$0	$0	$3
U02 SITEWORK		58	$0	$1,585	$0	$0	$1,58

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	(qty)	Ea.	Total
16613022300	SUR FLUOR STRIP 4' W 1 40W LAMP R S								
Unit values		0.94	26.74	22.52	0.00	0.00			49.
Totals		0.00	$0	$0	$0	$0			
16613022300	SUR FLUOR STRIP 4' W 2 40W LAMP R S								
Unit values		1.00	28.65	23.62	0.00	0.00			52.
Totals		0.00	$0	$0	$0	$0			
16613077777	L.E.D. EXIT SIGN RETROFIT KIT SINGLE FACE						5.00	EA	
Unit values		1.00	50.00	27.50	0.00	0.00			77.
Totals		5.00	$250	$138	$0	$0			$3
16613098C1	REC FLUOR TROFFER 2X2' W 2 31W T8-U ACRYLIC LENS						(qty.	EA	
Unit values		1.40	88.00	38.50	0.00	0.00			126.
Totals		0.00	$0	$0	$0	$0			
16613098C2	REC FLUOR TROFFER 2X4' W 1 32W T8 ACRYLIC LENS W REFLECTOR						4.00	EA	
Unit values		1.51	84.00	41.50	0.00	0.00			125.
Totals		6.04	$336	$166	$0	$0			$5
16613098C3	REC FLUOR TROFFER 2X4' W 3 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.60	90.00	44.00	0.00	0.00			134.
Totals		0.00	$0	$0	$0	$0			
16613098C4	REC FLUOR TROFFER 2X4' W 4 32W T8 ACRYLIC LENS						3.00	EA	
Unit values		1.70	94.00	47.00	0.00	0.00			141
Totals		0.00	$0	$0	$0	$0			
16613098C5	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS W/ REFLECTOR						112.00	EA	
Unit values		1.51	106.00	41.50	0.00	0.00			14.
Totals		169.12	$11,928	$4,648	$0	$0			$16,5
16613098C7	REC FLUOR TROFFER 2X4' W 2 32W T8 ACRYLIC LENS						(qty)	EA	
Unit values		1.14	73.00	31.50	0.00	0.00			104
Totals		0.00	$0	$0	$0	$0			
16613098C9	SUR FLUOR 2X4' W 2 32W T8						(qty)	EA	
Unit values		1.14	86.00	31.50	0.00	0.00			117

Totals	0.00	$0	$0	$0	$0	$(
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR				(qty)	EA
Unit values	1.14	90.00	31.50	0.00	0.00	121.5(
Totals	0.00	$0	$0	$0	$0	$(
1661388042	COMP FLUOR FIX, 2 13 W PL WALL / CEILING MOUNT				(qty)	EA
Unit values	1.00	25.50	27.50	0.00	0.00	53.0(
Totals	0.00	$0	$0	$0	$0	$(

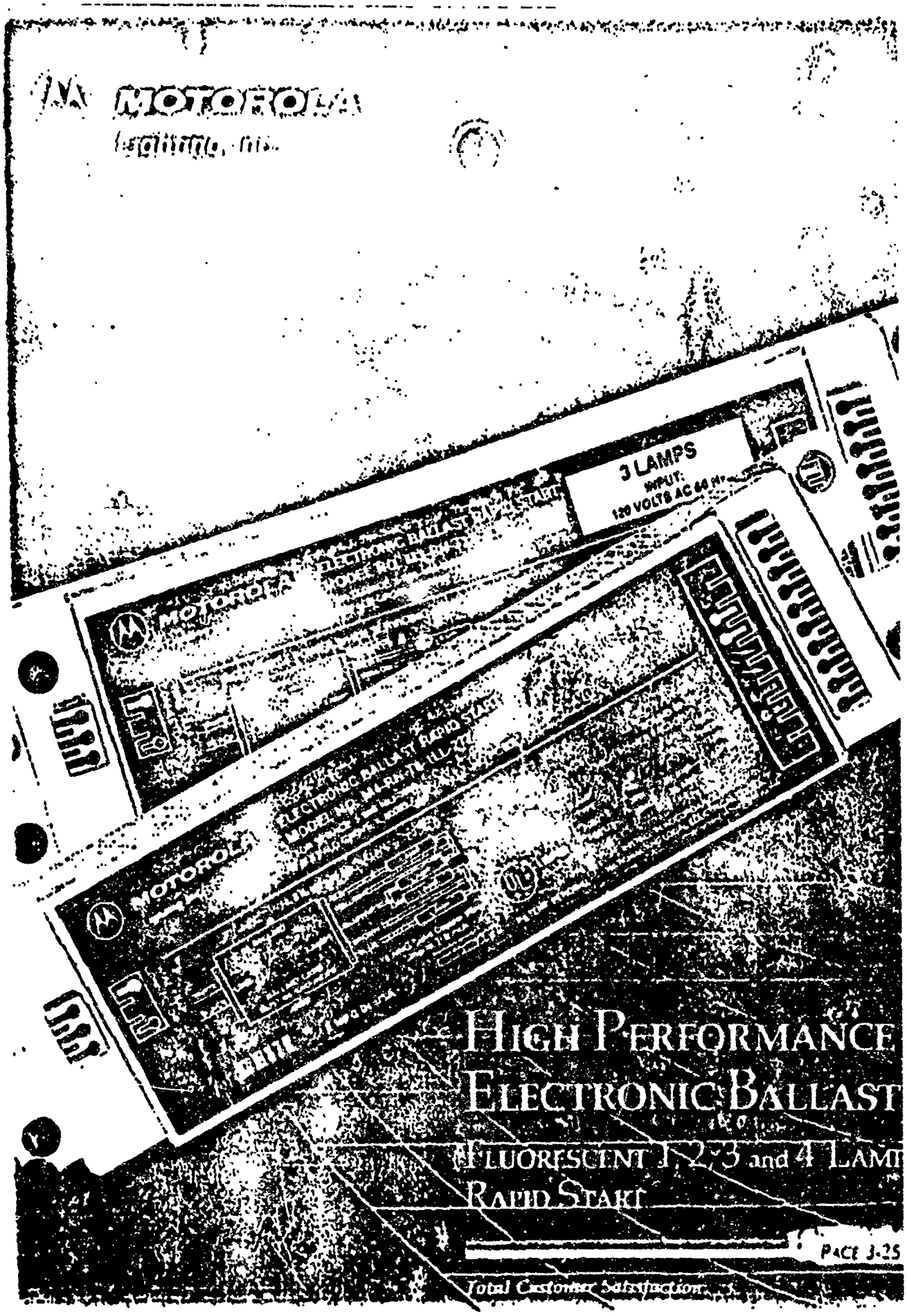
Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
D16 ELECTRICAL	161	$12,514	$4,952	$0	$0	$17,466
ESTIMATE TOTAL	239	$12,514	$6,537	$0	$0	$19,051
SALES TAX	5.00%	$626				
MATL MARKUP	-40.00%	($5,006)				
LABOR MARKUP	-13.40%		($875)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$8,134	$5,661	$0	$0	$13,795
CONTINGENCY	10.00%					$1,380
BOND	2.50%					$345
PROFIT	10.00%					$1,380
JOB TOTAL						$16,899

Estimate: Bldg. 7281 Date: 8 July 1994
Description: Storage / Admin.
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C02 SITEWORK	58	$0	$1,585	$0	$0	$1,585
C16 ELECTRICAL	181	$12,514	$4,952	$0	$0	$17,466
TOTAL	239	$12,514	$6,537	$0	$0	$19,051
SALES TAX	5.00%	$626				
MATL MARKUP	-40.00%	($5,006)				
LABOR MARKUP	-13.40%		($876)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$8,134	$5,661	$0	$0	$13,795
CONTINGENCY	10.00%					$1,380
BOND	2.50%					$345
PROFIT	10.00%					$1,380
JOB TOTAL						$16,899

MOTOROLA



HIGH PERFORMANCE ELECTRONIC BALLAST

FLUORESCENT 1, 2, 3 and 4 LAMP RAPID START

MOTOROLA
Lighting Inc.

Total Customer Satisfaction

CUSTOMER SUPPORT
1-800-MLI-0089

HIGH PERFORMANCE FEATURES

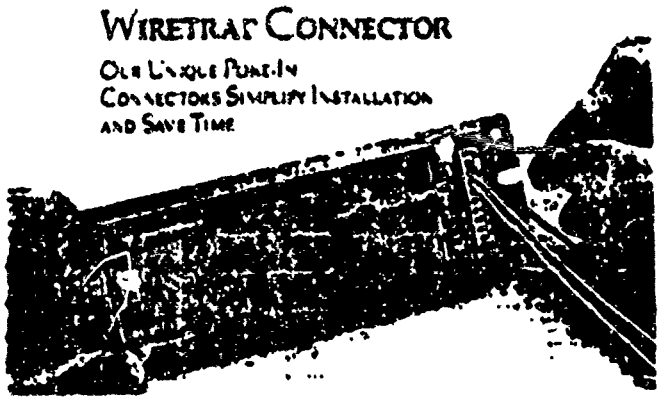
Power Factor:	Greater than 95
Total Harmonic Distortion:	Less than 10%
Third Harmonic Distortion:	Less than 5%
Lamp Current Crest Factor:	Less than 1.5
Lamp Current Frequency:	Greater than 25 KHz
Lamp Configuration:	Series
Lamp Flicker:	Less than 2%, Not Visible
Sound Rating:	Class A
Projected Life:	20 years plus
Connector:	Pokeim wire trac for 18 gauge (solid wire)
Weight:	1.2 lbs
EMI:	Meets FCC Part 18, Subpart C

CODES

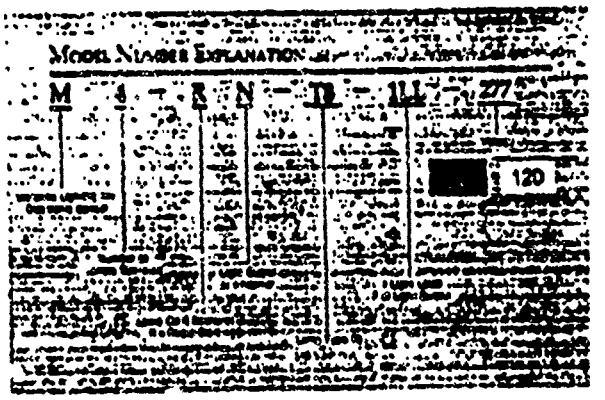
UL Listed:	Class P
Transient Protection:	Meets ANSI C62.41 Cat. A (Formerly IEEE 587)

WIRETRAP CONNECTOR

OUR UNIQUE PUSH-IN CONNECTORS SIMPLIFY INSTALLATION AND SAVE TIME



PART NUMBER DESCRIPTION



QUALITY

Motorola's goal of acceptable quality is at Six Sigma or no more than 3.4 defects per million opportunities. Motorola Lighting Inc. designed its electronic ballast to meet the most rigorous performance standards at world class levels. This translates into a highly robust product that goes through extensive environmental stress testing to assure our customers of very low initial defect levels (less than 0.1%) and high reliability (greater than 300,000 hours Mean Time to Failure--MTTF).

The economic ballast life is 20 years when operated at 45°C ambient temperature. Operation of MLI's ballast at 50°C may derate life expectancy by 25%.

Six Sigma Quality means "world class" in all that we do at Motorola Lighting Inc., which is part of our commitment to TOTAL CUSTOMER SATISFACTION.

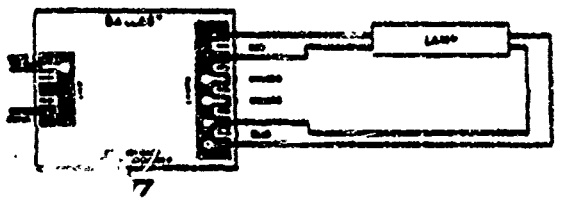
Rapid Start Ballasts

Lamp Type	Rated Lamp Wattage (W)	Lamp Length (FT)	Model No	Line Voltage (V)	Max Line Current (A)	Typical Line Current (A)	Typical Input Power (W) Open	Enclosed	Min. Starting Temp (F)
1 LAMP T8									
F32T8	32	4	M1-RN-T8-ILL-120	120	.31	.24	28	28	50°
F32T8	32	4	M1-RN-T8-ILL-277	277	.13	.11	29	28	50°
F25T8	25	3	M1-RN-T8-ILL-120	120	.24	.19	23	22	50°
F25T8	25	3	M1-RN-T8-ILL-277	277	.10	.08	23	22	50°
F17T8	17	2	M1-RN-T8-ILL-120	120	.17	.13	16	15	50°
F17T8	17	2	M1-RN-T8-ILL-277	277	.07	.06	16	15	50°
2 LAMP T8									
F32T8	32	4	M2-RN-T8-ILL-120	120	.53	.51	61	57	50°
F32T8	32	4	M2-RN-T8-ILL-277	277	.24	.21	57	54	50°
F25T8	25	3	M2-RN-T8-ILL-120	120	.42	.40	48	45	50°
F25T8	25	3	M2-RN-T8-ILL-277	277	.18	.17	46	44	50°
F17T8	17	2	M2-RN-T8-ILL-120	120	.27	.24	32	30	50°
F17T8	17	2	M2-RN-T8-ILL-277	277	.12	.10	34	31	50°
2 LAMP T12									
F40T12	40	4	M2-RN-T12-ILL-120	120	.64	.59	71	64	50°
F40T12	40	4	M2-RN-T12-ILL-277	277	.27	.25	69	67	50°
F40T12	34	4	M2-RN-T12-ILL-120	120	.54	.50	60	59	50°
F40T12	34	4	M2-RN-T12-ILL-277	277	.23	.21	58	57	50°
F40T10	40	4	M2-RN-T12-ILL-120	120	.64	.56	72	71	50°
F40T10	40	4	M2-RN-T12-ILL-277	277	.27	.25	70	68	50°
F30T12	30	3	M2-RN-T12-ILL-120	120	.48	.44	53	52	50°
F30T12	30	3	M2-RN-T12-ILL-277	277	.21	.19	52	50	50°
F30T12	25	3	M2-RN-T12-ILL-120	120	.46	.37	44	43	50°
F25T12	25	3	M2-RN-T12-ILL-277	277	.17	.16	43	42	50°
3 LAMP T8									
F32T8	32	4	M3-RN-T8-ILL-120	120	.78	.78	96	87	50°
F32T8	32	4	M3-RN-T8-ILL-277	277	.33	.32	90	86	50°
F25T8	25	3	M3-RN-T8-ILL-120	120	.61	.58	75	67	50°
F25T8	25	3	M3-RN-T8-ILL-277	277	.26	.25	66	66	50°
F17T8	17	2	M3-RN-T8-ILL-120	120	.39	.38	47	44	50°
F17T8	17	2	M3-RN-T8-ILL-277	277	.16	.14	44	41	50°
3 LAMP T12									
F40T12	40	4	M3-RN-T12-ILL-120	120	.92	.90	107	105	50°
F40T12	40	4	M3-RN-T12-ILL-277	277	.40	.38	105	103	50°
F40T12	34	4	M3-RN-T12-ILL-120	120	.84	.77	91	89	50°
F40T12	34	4	M3-RN-T12-ILL-277	277	.41	.33	88	86	50°
F40T10	40	4	M3-RN-T12-ILL-120	120	.99	.93	103	107	50°
F40T10	40	4	M3-RN-T12-ILL-277	277	.49	.48	107	105	50°
F30T12	30	3	M3-RN-T12-ILL	120	.76	.74	88	78	50°
F30T12	30	3	M3-RN-T12-ILL	277	.37	.29	78	76	50°
F25T12	25	3	M3-RN-T12-ILL	120	.71	.67	67	65	50°
F25T12	25	3	M3-RN-T12-ILL-277	277	.34	.24	66	64	50°
4 LAMP T8									
F32T8	32	4	M4-RN-T8-ILL-120	120	1.04	1.02	121	118	50°
F32T8	32	4	M4-RN-T8-ILL-277	277	.44	.43	118	115	50°
F25T8	25	3	M4-RN-T8-ILL-120	120	.81	.80	95	91	50°
F25T8	25	3	M4-RN-T8-ILL-277	277	.35	.34	93	90	50°
F17T8	17	2	M4-RN-T8-ILL-120	120	.53	.49	67	64	50°
F17T8	17	2	M4-RN-T8-ILL-277	277	.22	.18	61	58	50°

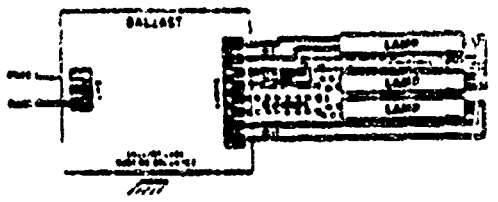
Shall Not Operate the U Shaped Fluorescent of the Above Lamps Test Data from Independent Test Lab Available on Request from Factory

Wiring Diagrams And Ballast Dimensions

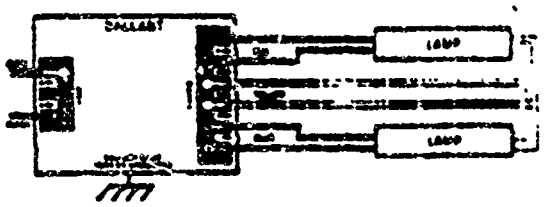
Wiring Diagrams



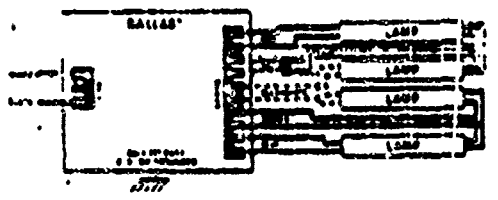
1 LAMP



3 LAMP

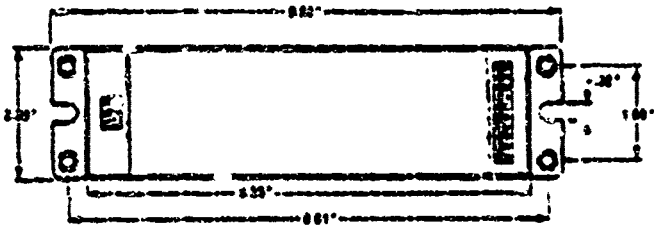


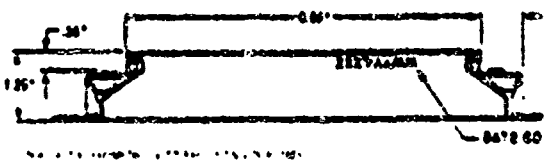
2 LAMP

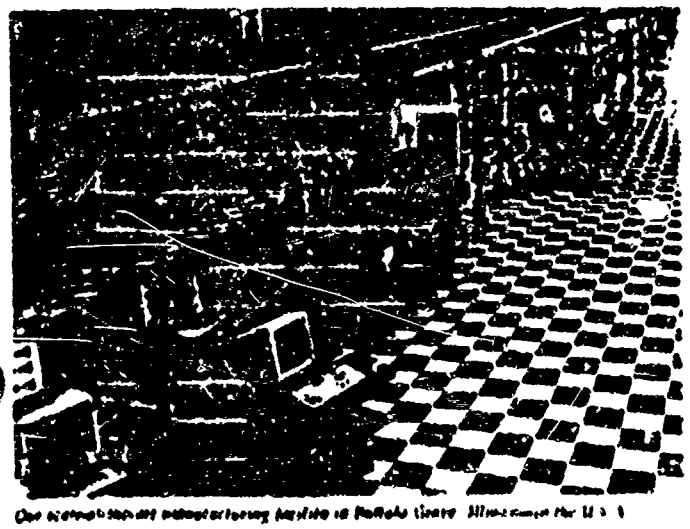


4 LAMP

Ballast Dimensions*





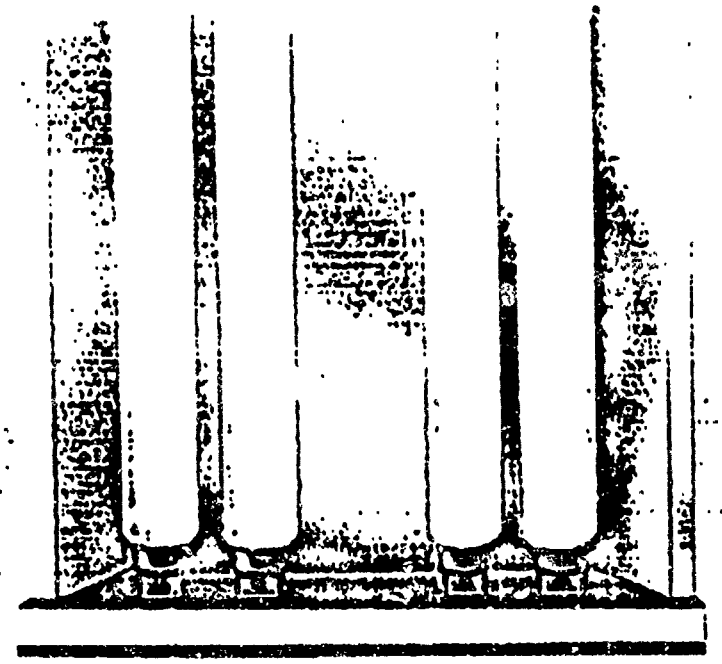


Our recommended ballast for Rapid Start fixtures. Dimensions for U.S.A.

MOTOROLA
Lighting Inc.

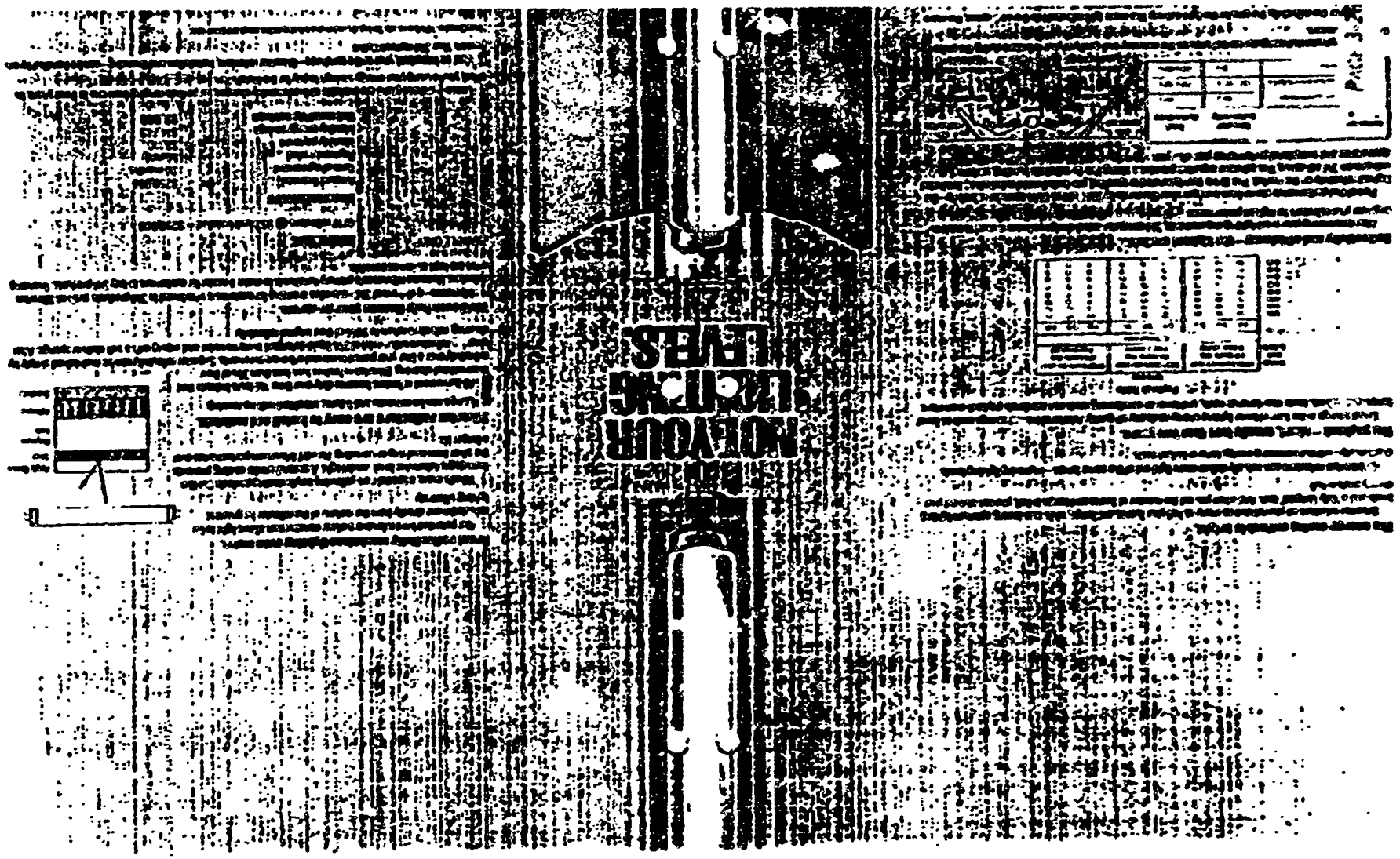
[illegible]

[illegible]



SILVERLUX™ REFLECTORS CUT YOUR LIGHTING ENERGY COSTS IN HALF.




NOR'EASTER
LEVERS

SILVERLUX FLUORESCENT REFLECTORS

- Cut energy costs, not light levels or enhance lighting levels
- Pay for themselves in two years or less
- Install and maintain easily
- Warranted for 5 years
- Attractive low-rate financing available
- Available from national service dealer network

For more information just call.

3M is a part of the Green Lights Program – a voluntary non-regulatory program organized by the Environmental Protection Agency (EPA). This program encourages companies to take advantage of new lighting technologies and design practices that benefit the environment. 3M is a charter member of the program because it participates as both a consumer of electrical lighting energy and as a developer of electrical lighting products. Several of the facilities demonstrate 3M's commitment to energy-efficient lighting technologies that reduce energy consumption and pollution while delivering the same or better lighting.

Cut costs, not lighting.

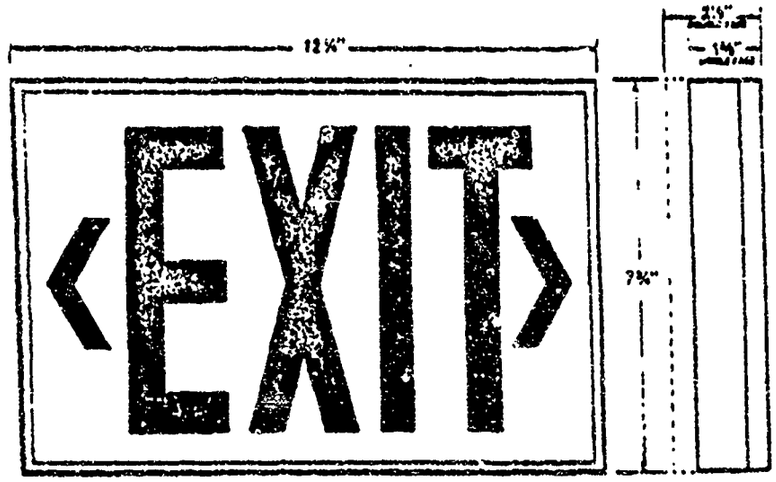
Innovation working for you.

3M Construction Markets
3M Center Bldg 225-4S-08
St Paul MN 55144-1000
612-736-2388

Job 6429 Fiche 3 02/04/99 06:55AM
Main Table DTICNEW MPT
Break Table

Evenlite LED Exit Lights — EV SERIES

The LED of the 21st Century



No Ifs, Ands or Buts.

This is exactly how the EVENLITE 2000 appears! Perfectly even illumination is produced by indirect lighting, so that the LED's are invisible, with no hot spots. All this is provided in the slimmest sign on the market with integral charger and battery.

No competitor comes close to these combined specifications:

- Less than 3 watts total power per face
- Perfect light distribution across face
- Single face only 1⅞" thick
- Double face only 2⅛" thick
- Remote unit only ½" thick
- Multiple LED lamps with 20 year unconditional guarantee
- NICAD batteries with 5 year guarantee
- Aluminum housing for light weight and strength
- Universal mount
- Baked enamel, vinyl clad or satin anodized finishes
- Polycarbonate faceplate

Patent Pending

SHIELD SOURCE INCORPORATED
320 VFW Avenue, Gaithersburg, Maryland 21630
Tel: (410) 827-6072 Fax: (410) 827-9657

PIONEER

1011 Series

Economy!



UL Listed

STANDARD FEATURES
- White translucent acrylic lens
- White enamel finished steel pan
- 120 volt class "P" ballast
- Lamp(s) included

OPTIONS
- High power factor ballast.
- 277 volt ballast
- Theft proof screws

MODEL#	WATTAGE	L	D
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

EXPLORER

1110 Series

Low Profile!



UL Lis

STANDARD FEATURES
- White vandal resistant lexan lens
- Black lexan housing.
- 120 volt class "P" ballast
- White powder coated reflector.
- Lamp(s) included

OPTIONS
- High power factor ballast.
- 277 volt ballast
- White lexan housing

MODEL#	WATTAGE	L	D
SP 01	[illegible]	11"	35"

ECLIPSE

5012 Series

New!



UL Listed

STANDARD FEATURES
- White translucent acrylic lens
- White enamel finished steel pan
- 120 volt class "P" ballast.
- Lamp(s) included

OPTIONS
- High power factor ballast.
- 277 volt ballast.
- Theft proof screws.

MODEL#	WATTAGE	L	D
EC 3012	[illegible]	12"	4 [illegible]
EC 3018	[illegible]	18"	4 35"

PLUTO

1303 Series

Vandal!





UL Lis

STANDARD FEATURES
- White heavy gauged lexan lens.
- Corrosion-proof lexan base.
- White powder coated reflector.
- Lamp(s) included.
- 120 volt class "P" ballast.

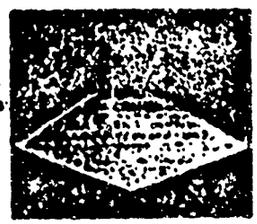
OPTIONS
- High power factor ballast
- 277 volt ballast

MODEL#	WATTAGE	L	D
[illegible]	[illegible]	19"	4 25"

DISCOVERY

3011 Series

Traditional Square!



UL Listed

STANDARD FEATURES
- White translucent acrylic lens.
- White enamel finished steel pan.
- 120 volt class "P" ballast
- Lamp(s) included.

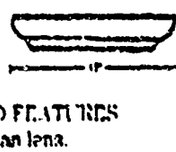
OPTIONS
- High power factor ballast
- 277 volt ballast.
- Theft proof screws

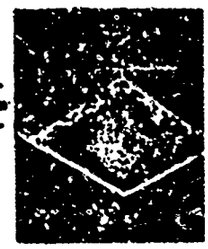
MODEL#	WATTAGE	L	D
DS 3011	[illegible]	[illegible]	[illegible]
DS 3018	[illegible]	[illegible]	[illegible]

COSMO

3460 Series

Low Profile!





UL Lis

STANDARD FEATURES
- White lexan lens.
- White vandal-proof lexan lens
- 120 volt class "P" ballast
- Lamp(s) included

OPTIONS
- High power factor ballast
- 277 volt ballast

MODEL#	WATTAGE	L	D
CS 1460	[illegible]	[illegible]	[illegible]

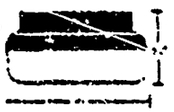


UL Listed

ARMSTRONG

1302 Series

Vandal-Lite!



STANDARD FEATURES

- White heavy gauged lexan lens.
- Corrosion-proof lexan base.
- 120 volt class "P" ballast
- Lamp(s) included.

OPTIONS

- High power factor ballast.
- 277 volt ballast.

MODEL#	WATTAGE	L	D
AR 1302	[illegible]	10"	[illegible]

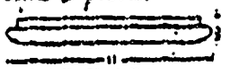


UL Listed

STRATUS

2011 Series

Low Profile Square!



STANDARD FEATURES

- White translucent acrylic lens.
- White enamel finished steel pan.
- 120 volt class "P" ballast.
- Lamp(s) included.

OPTIONS

- High power factor ballast.
- 277 volt ballast.
- Theft proof screws.

MODEL#	WATTAGE	L	D
ST 2011	[illegible]	11"	2.75"
ST 2014	[illegible]	14"	2.75"

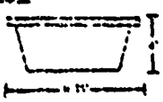


UL Listed

CENTURY

1010 Series

Vandal-Lite!



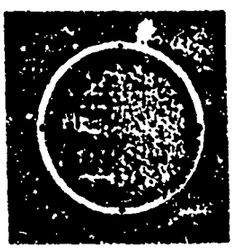
STANDARD FEATURES

- White extra strong lexan lens.
- White enamel finished steel pan.
- 120 volt class "P" ballast.
- Lamp(s) included.

OPTIONS

- High power factor ballast.
- 277 volt ballast.
- Theft proof screws

MODEL#	WATTAGE	L	D
CE 1010	[illegible]	[illegible]	4"



UL Listed

NOVA

200 Series

Euro-Lite!



STANDARD FEATURES

- Opal polycarbonate diffuser.
- White corrosion-proof lexan base.
- White powder coated reflector.
- 120 volt class "P" ballast.
- Lamp(s) included.

OPTIONS

- Black or white cage.
- Black lexan housing.
- Theft proof screws.

MODEL#	WATTAGE	L	D
NV 209	[illegible]	18"	5"



UL Listed

HALO

333 Series

Economy!



STANDARD FEATURES

- Durable polycarbonate base.
- Available in white or black.
- White 6" acrylic globe.
- 120 volt class "P" ballast.
- Lamp included.

OPTIONS

- Clear prismatic jar.
- White acrylic jar.
- HPF module.

MODEL#	WATTAGE	L	D
HL 333 Globe	[illegible]	9"	6"
HL 334 Jar	[illegible]	7.5"	4"



UL Listed

KENNEDY

030 Series

Vandal-Lite!



STANDARD FEATURES

- Brushed satin cast aluminum housing.
- Durable white lexan jar.
- 120 volt class "P" ballast.
- Lamp included.

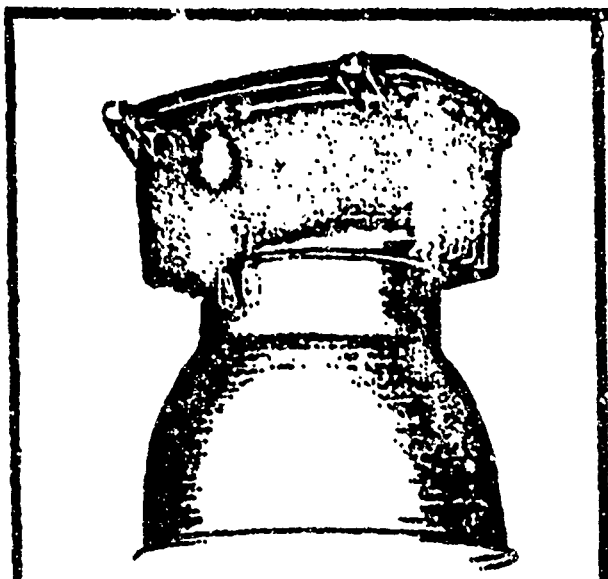
OPTIONS

- Clear prismatic jar
- 6" round globe.
- High power factor ballast.
- Pull chain.

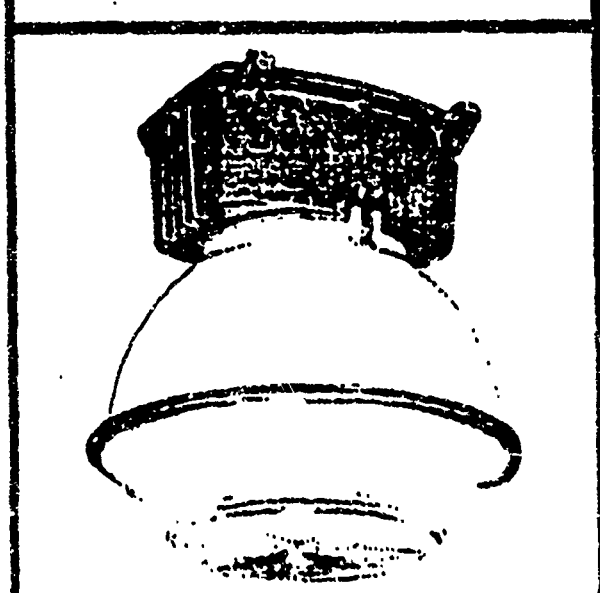
MODEL#	WATTAGE	L	D
KD 030 Jar	[illegible]	[illegible]	4"
KD 031	[illegible]	[illegible]	[illegible]

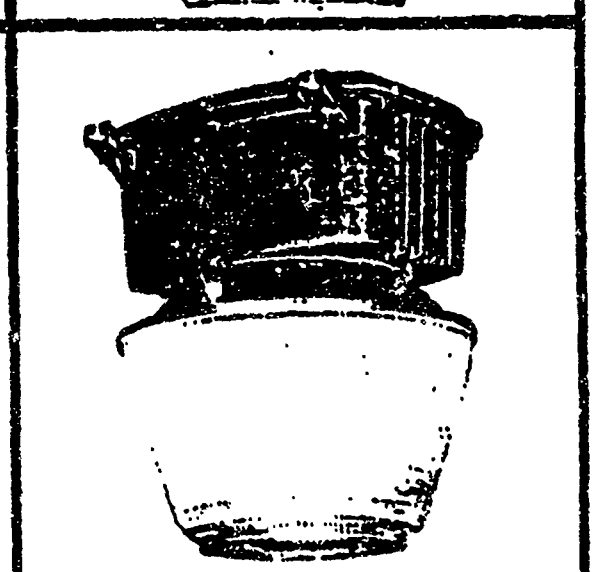
LOWBAY

Low to medium wattage industrial luminaire.
Ideal for areas having restricted ceiling heights and wet locations.









LOWBAY

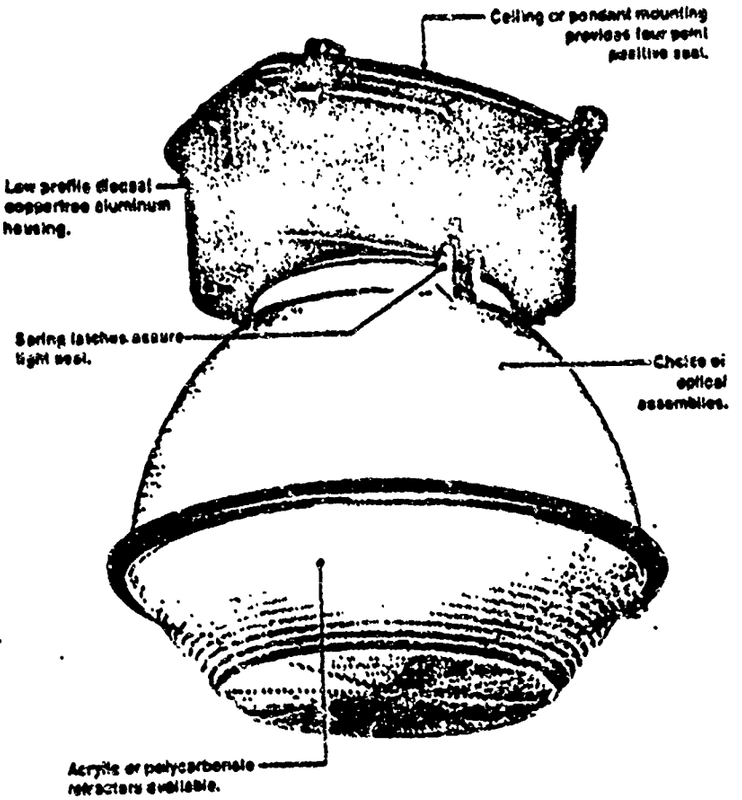
Provides optimum efficiency at low mounting heights.

Lowbay offers energy-efficient solutions to a wide range of industrial and warehousing installation requirements. This industrial-grade HID luminaire provides both efficient distribution and exceptional brightness control for task lighting or in areas where low headroom is a problem. A choice of optical equipment allows Lowbay to meet a variety of spacing and performance requirements to satisfy even the toughest specification.

Features:

Mounting — Choice of a ¾" NPT threaded pendant, balanced pendant or ceiling mounting. All mounting adapters have two hinges and four closure screws, thereby providing four-point compression on the gasket for a positive seal. In addition, the offset pendant hub ensures plumb mounting.

Ballast housing — Die cast copper-free aluminum low profile housing with an efficient heat sink design for cool operation and long ballast life. Hubbell's Lowbay is hinged for quick installation to mounting adapters allowing easy access to large splice compartment. Finished in durable grey Lektrocote™



Optical Equipment — Lowbay offers a choice of open or enclosed reflectors, acrylic or polycarbonate refractors and reflector/refractor combinations.

1. Open-Enclosed Reflector. High purity spun aluminum finished in Anodark® Lens on the enclosed reflector is thermal shock and impact resistant for added protection.

2. Reflector/Refractor Combination. Reflector portion is high purity spun aluminum finished in white Lektrocote for low brightness and high reflectivity. Its refractor gives symmetrical (Type S) distribution and is available in either acrylic or polycarbonate.

3. Refractors — UV stabilized acrylic refractors are available for symmetrical (Type S) or asymmetrical (Type E) distribution. Also available in polycarbonate for vandal resistance.

4. Large Reflector/Refractor — Spun aluminum reflector has Anodark finish and polycarbonate refractor. Available in Type II or Type V distribution.

All optical assemblies except large reflector/refractor attach to the ballast housing by two positive spring latches. Large assembly has a fully threaded neck.

Reliable, Long Life Ballast — Class "H" insulated, -20°F starting (-40°F HPS) 60 Hz, high power factor ballast isolated from the optical chamber for optimum performance and long life. 50 Hz ballasts available, consult factory.

Additional Features — U.L. listed for wet locations and 40°C ambient operation.

SPECIFYING INFORMATION

REFLECTOR (FIGURE 1)

Lamp and Wattage	Basic	Weight lbs.	Weight kgs.	Enclosure	Weight lbs.	Weight kgs.
MERCURY VAPOR						
100	L94-100C1-0-P	12½	5.7	L94-100C2-0-P	14½	6.6
175	L94-175C1-0-P	13	5.9	L94-175C2-0-P	15½	6.9
250	L94-250C1-0-P	16	7.3	L94-250C2-0-P	17½	7.9
METAL HALIDE						
175	—	—	—	L94-175M2-0-P	17½	7.9
250	—	—	—	L94-250M2-0-P	19½	8.8
HIGH PRESSURE SODIUM						
70	L94-070S2-0-P	13	5.9	L94-070S2-0-P	15½	6.9
100	L94-100S2-0-P	15	6.8	L94-100S2-0-P	17½	7.9
150*	L94-150S2-0-P	16½	7.5	L94-150S2-0-P	18	8.4

REFLECTOR/REFRACTOR (FIGURE 2)

Lamp and Wattage	Basic	Weight lbs.	Weight kgs.	Enclosure	Weight lbs.	Weight kgs.
MERCURY VAPOR						
100	L94-100C1-0-P	12½	5.7	L94-100C2-0-P	14½	6.6
175	L94-175C1-0-P	13	5.9	L94-175C2-0-P	15½	6.9
250	L94-250C1-0-P	16	7.3	L94-250C2-0-P	17½	7.9
METAL HALIDE						
175	—	—	—	L94-175M2-0-P	17½	7.9
250	—	—	—	L94-250M2-0-P	19½	8.8
HIGH PRESSURE SODIUM						
70	L94-070S2-0-P	13	5.9	L94-070S2-0-P	15½	6.9
100	L94-100S2-0-P	15	6.8	L94-100S2-0-P	17½	7.9
150*	L94-150S2-0-P	16½	7.5	L94-150S2-0-P	18	8.4

REFRACTOR (FIGURE 3)

SYMMETRICAL — TYPE V						ASYMMETRICAL TYPE II					
Lamp and Wattage	Basic	Weight lbs.	Weight kgs.	Enclosure	Weight lbs.	Lamp and Wattage	Basic	Weight lbs.	Weight kgs.	Enclosure	Weight lbs.
MERCURY VAPOR						MERCURY VAPOR					
100	L94-100C1-0-P	12½	5.7	L94-100C2-0-P	14½	100	L94-100C2-0-P	12½	5.7	L94-100C2-0-P	14½
175	L94-175C1-0-P	13	5.9	L94-175C2-0-P	15½	175	L94-175C2-0-P	13	5.9	L94-175C2-0-P	15½
METAL HALIDE						METAL HALIDE					
175	L94-175M1-0-P	17	7.7	L94-175M2-0-P	17½	175	L94-175M2-0-P	17	7.7	L94-175M2-0-P	17½
HIGH PRESSURE SODIUM						HIGH PRESSURE SODIUM					
70	L94-070S1-0-P	14	6.4	L94-070S2-0-P	16½	70	L94-070S2-0-P	14	6.4	L94-070S2-0-P	16½
100	L94-100S1-0-P	15	7.3	L94-100S2-0-P	17½	100	L94-100S2-0-P	15	7.3	L94-100S2-0-P	17½
150*	L94-150S1-0-P	17½	7.9	L94-150S2-0-P	18	150*	L94-150S2-0-P	17½	7.9	L94-150S2-0-P	18

LARGE REFLECTOR/REFRACTOR (FIGURE 4)

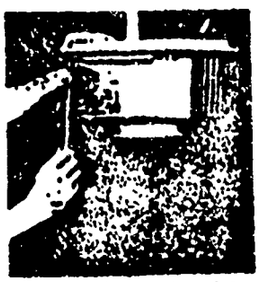
SYMMETRICAL — TYPE V				ASYMMETRICAL — TYPE II			
Lamp and Wattage	Basic	Weight lbs.	Weight kgs.	Lamp and Wattage	Basic	Weight lbs.	Weight kgs.
MERCURY VAPOR				MERCURY VAPOR			
400	L94-400C1-1-P	33½	14.7	400	L94-400C2-1-P	35½	15.7
HIGH PRESSURE SODIUM				HIGH PRESSURE SODIUM			
250	L94-250S1-1-P	27½	12.3	250	L94-250S2-1-P	29½	13.2
400	L94-400S1-1-P	30½	13.5	400	L94-400S2-1-P	32½	13.6

*Lamp supplied with 277 volt ballast. For operating on 120, 208, 240, 277 volt, 60 Hz Quad "Max" ballast. Not for use with 347 volt.

Lowbay Installation Instructions



- Install mounting adapter
- As housing hangs on mounting adapter, complete electrical connection.



- Close and secure housing to mounting adapter



- Install lamp and attach optics.

Dimensions

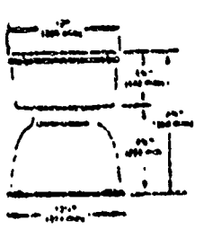


Figure 1
Reflector

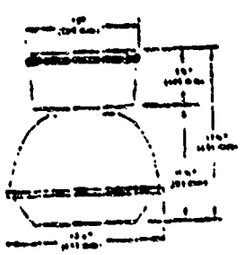


Figure 2
Reflector-Refractor

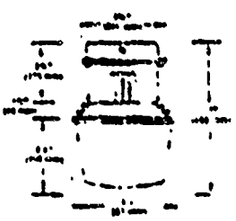


Figure 3
Refractor



Figure 4
Large Reflector Refractor

OPTIONS

The following factory mounted options are available with the LB/Q Series. They must be ordered separately with the fixture by adding the appropriate suffix using Ordering Logic.

Suffix	Description
-CH*	CORD AND HOOK - 24" SJO (150 cm) 18 ga. cable with hook
-CL*	CORD AND LOOP - 24" SJO (150 cm) 18 ga. cable with loop
-P (21)**	PLUG-NEMA Hubbell TWIST-LOCK® Plug Order with 2- or 3- digit
-P (21)**	PLUGS - Select from 120-277 volt. Straight blade to 208-240 volt
-RPC	REFLECTOR POLYCARBONATE - 3 mil coating over aluminum reflector to enhance UV surface protection and add chemical, salt spray and
-S	QUARTZ STANDBY SYSTEM - Use up to 250 watt (70 volt D.C. Standby

* Fixtures supplied without cabling with "CH" or "CL" option will be labeled with substitute ambient temp

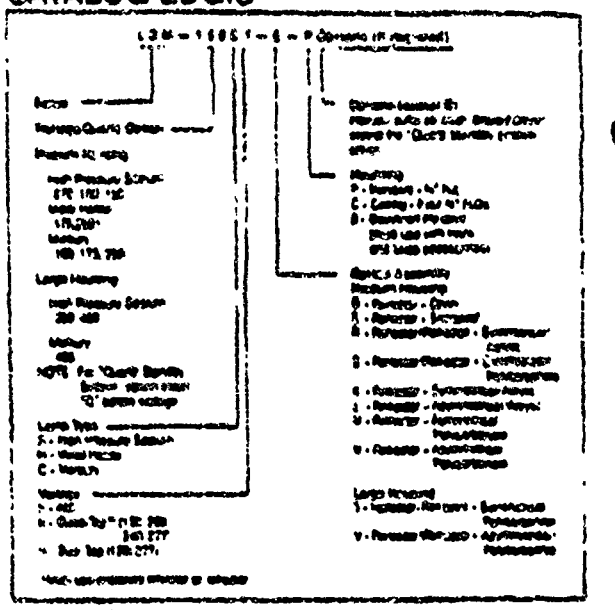
** To specify voltage replace "21" with 1 (120V) 2 (208V) 3 (240V) 4 (277V) 5 (480V)

ACCESSORIES

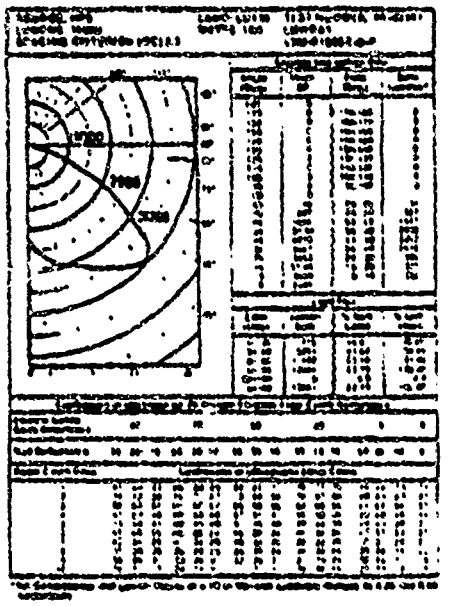
The following accessories are available for the LB/Q Series. They must be ordered separately.

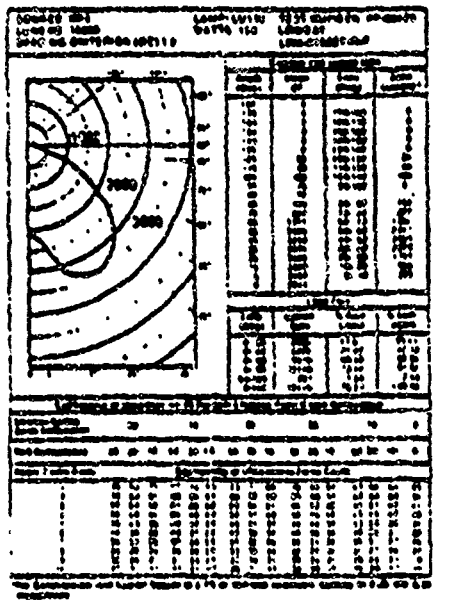
Catalog Number	Description
WG-2	Wire guard for luminaire housing without lens only
HOOK	Cable with 3" hook mounted to luminaire
LOOP	Cable with 3" loop mounted to luminaire

CATALOG LOGIC



PHOTOMETRIC DATA





Suggested Specifications

General

Luminaire shall be Hubbell Lighting Div. LB/Q Series, Catalog Number LB/Q_____ for use with a _____ watt _____ lamp.

Mechanical

Select housing shall be die cast copper-free aluminum with internal heat sink design for cast sealed construction and long life. The sealed housing shall be hinged for quick, easy access for mounting adapter allowing easy access to large screw compartment.

Each housing shall have two sealed holes for permanent attachment of the luminaire. The optical attachment area of the housing shall latch to the optical system and be gasketed.

Mounting adapter shall be for _____ mounting of the unit. Adapter shall be die cast copper-free aluminum. Mounting adapter must have two hinge points and two captive screw points to provide four point compression on the gasket for a positive seal. Gasket shall be high temperature, sealed slit neoprene.

Sealed housing and mounting adapter shall be finished in grey undercoat powder powder paint. All external hardware shall be corrosion resistant material.

Optical

Unit shall be furnished with optical assembly producing a NEMA _____ distribution. Sealing means shall be _____ lens prismatic glass.

Performance

Sealed unit as Class "P" assembly (-40° to +40°C), 60 Hz, required high power factor type. The fixture shall be UL approved for wet locations and for 40°C operation.

HUBBELL® Lighting

Hubbell Lighting Division, 2000 Electric Way, Christiansburg, Virginia 24073, (703) 382-6111 • Fax (703) 382-1536 • Telex 80-1073
Hubbell Canada, Inc., 870 Brock Road S., Box 100, Pickering, Ontario L1V2R3 (416) 839-1138 • Fax (416) 839-8108 • Telex 06-981266

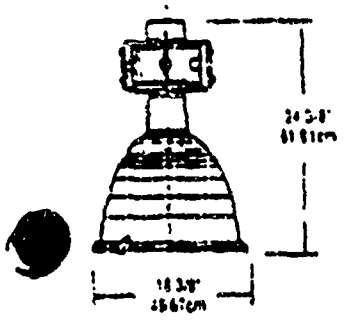
High-Bay Industrial Lighting

ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory Installed)

☐	TE 175M E17C	☐ 120	Shipped Installed in Fixture
☐	TE 175M E17M	☐ 208	
☐	TE 175M E17S	☐ 240	
☐	TE 175M E17W	☐ 277	
		☐ 480	
		☐ TB[2]	

C = Concentrating
M = Medium
S = Spread
W = Wide Spread



DISTR	S/MH
E17C	1.0
E17M	1.4
E17S	1.6
E17W	2.0

Weight: 27lbs / 12kg

☐	SF	Single Fuse (120-277V); n/a TB
☐	DF	Double Fuse (208,240,480V); n/a TB
☐	EC	Emergency Circuit (lamp not included)
☐	ORS[3]	Quartz Restrike System (lamp not included)
☐	ORSTD[3]	ORS Time Delay (lamp not included)
☐	HA	65°C Ambient Operation
☐	CR	Corrosion Resistant Finish (polyester)
☐	CRT	Corrosion Resistant Finish (teflon)
☐	TEF	Teflon Finished Reflector
☐	TOS[1]	Three-Wire Outlet Box
☐	TOS[1][4]	Three-Wire Outlet Box Pigtail
☐	PIG[4]	Pendant Box Pigtail
☐	LCP[4]	Loop Cord & Plug for PPH & PPV
☐	LC3P[4][11]	Loop 3' Cord & 15A NEMA Twist-Lock Plug
☐	HC3P[4][11]	Hook 3' Cord & 15A NEMA Twist-Lock Plug
☐	LRCA[4][11]	Loop 3' Cord & Relay RCA Connector
☐	HRCA[4][11]	Hook 3' Cord & Relay RCA Connector
☐	LUCP[4]	Loop Cord and Plug For UPM
☐	LUCPSF[4]	LUCP w/Single Fuse (feed from) n/a TB
☐	LUCPDF[4]	LUCP w/Double Fuse (feed from) n/a TB
☐	UCP[4]	Universal Cable & Plug for UPM
☐	UCPSF[4]	UCP w/Single Fuse (feed from)
☐	UCPDF[4]	UCP w/Double Fuse (feed from)
☐	TR	Remote Ballast
☐	TRCP2[4][11]	TR w/Pre-Wired Cable[5]
☐	WL	Wet Location "L" Label
☐	C73T[6]	Corning C73 Pattern Tempered Glass Lens
☐	SSS	Stainless Steel Screws
☐	SLR	Stainless Steel Long Rods
☐	UP	UP Lamp
☐	CF	Charcoal Primer

Shipped Separately[7]

☐	HKM[8]	Fixture Hook - Male
☐	HKMG[8]	Grommeted Fixture Hook - Male
☐	LPM[8]	Fixture Loop - Male
☐	LPMG[8]	Grommeted Fixture Loop - Male
☐	TPH[8]	Tenon Power Hook
☐	PPH[8]	Pendant Power Hook
☐	UPM[9]	Universal Power Module
☐	UPM1[9]	UPM w/Hook Adapter Plate
☐	UPM2[9]	UPM w/Wiring Block
☐	UPM3[9]	UPM w/Hook Adapter Plate & Wiring Block
☐	WG	Wire Guard-Aluminum Reflector
☐	LG	Louver Guard
☐	DCY	Cylinder Shade
☐	DSQ	Square Shade
☐	DHX	Hexagonal Shade

ACCESSORIES (Field Installed)
(Order as separate line item)

CATALOG No.	Description
HKF[8]	Fixture Hook - Female
LPF	Fixture Loop - Female
SCK	Safety Chain Kit
TMB	Tenon Mounting Bar (specify tenon)[10]

NOTES

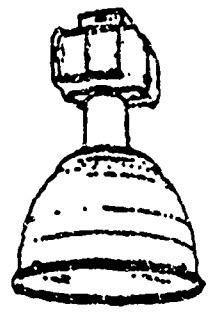
1. May also be ordered with 5', 10', 15' cord lengths
2. Wire-Tap Ballast (120,208,240,277V)
3. Quartz lamp wattage not to exceed ballast wattage rating
4. May be ordered as accessory (MUST see Industrial Accessories Sheet for ordering information)
5. 36" cable to connect to remote ballast
6. 22 amp standard 480V
7. May change distribution. Consult factory.
8. Not available W/ 480V

For Complete Description & Application information See Options & Accessories Sheet I-OPA

Fixture Type

TE

METAL HALIDE
175W
12' to 20' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight, die-cast aluminum with dark bronze polyester powder finish. Electrical components are opposed horizontally and heat-sinked to [illegible] housing for cooler operation.

BALLAST - High power factor [illegible] wattage autotransformer, 180° [illegible] insulation system.

OPTICS - One piece totally enclosed gasketed Arc Tex II spun aluminum [illegible] reflector combines high efficiency [illegible] shielding angle for high performance optical control. Exclusive fluting design minimizes arc tube voltage rise. Gasketed clear tempered glass lens enables the entrance of ambient contaminants.

INSTALLATION - Pendant spicy box threaded for 3/4" conduit (standard). Complete line of mounting options and accessories available.

LISTING - UL 1572 listed for damp location and -30°C to 35°C ambient operation. UL wet location label option available.

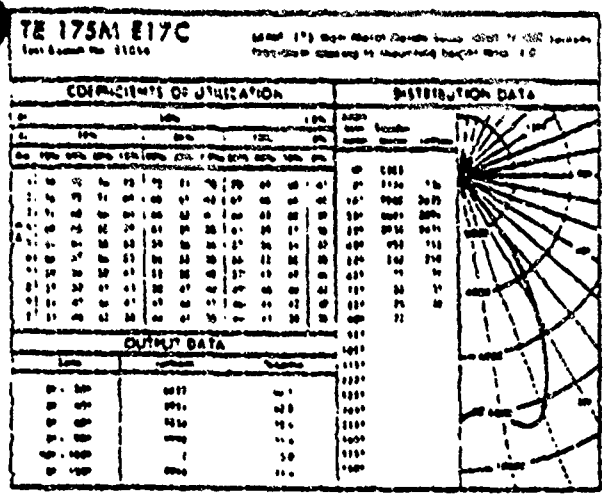
SOCKET - Porcelain vertically oriented mogul base socket with copper alloy metal plated screw shell and center contact. UL rated 1500V, 660V.

LITHONIA HI-TEK
INDUSTRIAL OUTDOOR LIGHTING
A DIVISION OF LITHONIA LIGHTING

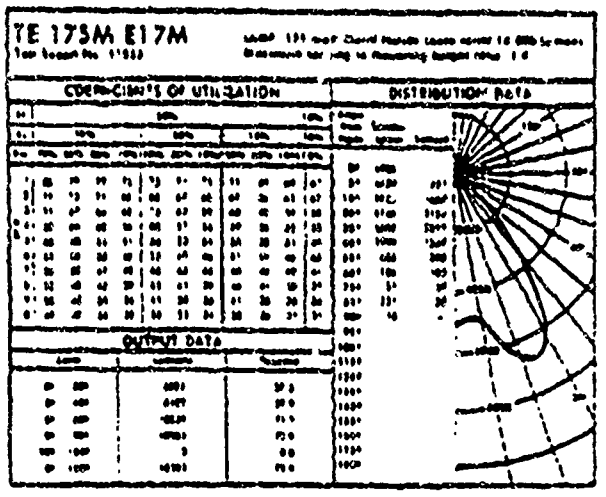
PHOTOMETRIC DATA

The charts below provide the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For complete results of any combination shown or other requirements, contact your HI-TEK / LITHONIA representative.

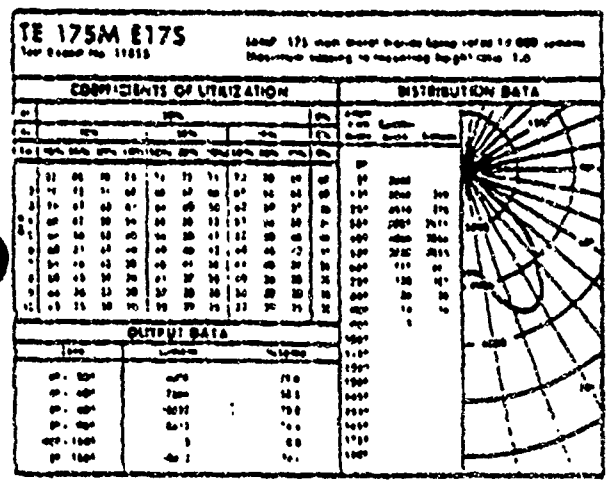
TE 175M E17C



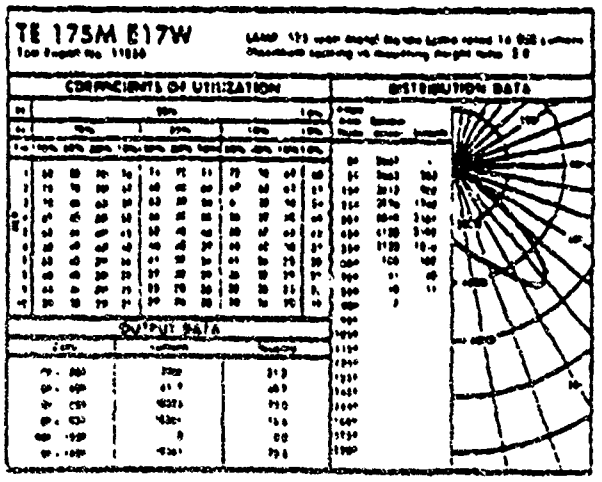
TE 175M E17M



TE 175M E17S



TE 175M E17W



ELECTRICAL CHARACTERISTICS

	120		70			
175	350		115			
175M	340		125	210	60Hz	
Pulse Start	277		110			
	480		160			

LITHONIA
HI-TEK
GEORGIA GULF LIGHTING
A DIVISION OF LITHONIA LIGHTING

High-Bay Industrial Lighting

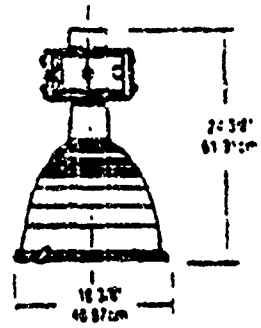
ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory installed)

- ☐ TE 250M E17C
- ☐ TE 250M E17M
- ☐ TE 250M E17S
- ☐ TE 250M E17W

- ☐ 120
- ☐ 208
- ☐ 240
- ☐ 277
- ☐ 480
- ☐ T8[1]

C = Concentrating
M = Medium
S = Spread
W = Widespread



DISTR.	S/MH
E17C	1.8
E17M	1.3
E17S	1.6
E17W	1.9

Weight: 24lbs (11kg)

NOTES:

1. May also be ordered with 5', 10', 15' cord lengths.
2. Multi-Tap Ballast (120 208 240 277V)
3. Supply lamp wattage not to exceed ballast wattage rating.
4. May be ordered as accessory (MUST see Industrial Accessories Sheet for ordering information
5. 36" cable to connect fixture to remote ballast
6. 20 amp standard 480V
   May change distribution
   Consult factory
7. Not available WL option

For Complete Description & Application Information, See Options & Accessories Sheet I-O-A

Shipped Installed in Fixture

- ☐ SF — Single Fuse (120 277V) n/a T8
- ☐ DF — Double Fuse (208 240 480V) n/a T8
- ☐ EC — Emergency Circuit (lamp not included)
- ☐ CRS[2] — Cutler Resistor System (lamp not included)
- ☐ CRSTD[2] — CRS Time Delay (lamp not included)
- ☐ HA — 65°C Ambient Operation
- ☐ CR — Corrosion Resistant Finish (polyester)
- ☐ CRT — Corrosion Resistant Finish (epoxy)
- ☐ TEF — Teflon finished Reflector
- ☐ TDB[3] — Two-Wire Outlet Box
- ☐ TDBP[3] — Two Wire Outlet Box Pluggin
- ☐ PB[3] — Pendant Box Pluggin
- ☐ LCPP[3] — Loop Cord & Plug for PPM & PPMI
- ☐ LCSP[3,4] — Loop 3' Cord & 15A NEMA Twist Lock Plug
- ☐ HCSP[3,4] — Hook 3' Cord & 15A NEMA Twist Lock Plug
- ☐ LRCA[3] — Loop 3' Cord & Pelco RCA Connector
- ☐ HRCA[3] — Hook 3' Cord & Pelco RCA Connector
- ☐ LUCP[3] — Loop Cord and Plug For UPM1
- ☐ LUCPSP[3] — LUCP w/Single Fuse (dead front) n/a T8
- ☐ LUCPDP[3] — LUCP w/Double fuse (dead front) n/a T8
- ☐ UCP[3] — Universal Cord & Plug for UPM
- ☐ UCPSP[3] — UCP w/Single Fuse (dead front)
- ☐ UCPDP[3] — UCP w/Double Fuse (dead front)
- ☐ TR — Remote Ballast
- ☐ TRCP[3,5] — TR w/Pre-Wired Cable
- ☐ WL — Wet Location UL Label
- ☐ C73T[7] — Corning C73 Pattern Tempered Glass Lens
- ☐ SSS — Stainless Steel Screws
- ☐ SLR — Stainless Steel Lens Rings
- ☐ UP — UP Light
- ☐ CF — Charcoal Finish

Shipped Separately [6]

- ☐ HEM[3] — Fixture Hook - Male
- ☐ HEMG[3] — Grommeted Fixture Hook - Male
- ☐ LPM[3] — Fixture Loop - Male
- ☐ LPMG[3] — Grommeted Fixture Loop - Male
- ☐ TPM[3] — Two-Wire Power Hook
- ☐ PPM[3] — Pendant Power Hook
- ☐ UPM[3] — Universal Power Module
- ☐ UPM1[3] — UPM w/Open Adapter Plate
- ☐ UPMJ[3] — UPM w/Knock Slots
- ☐ UPMJ[3] — UPM w/Knock Adapter Plate & Wiring Box
- ☐ WG — Wire Guard/Aluminum Reflector
- ☐ LG — Louver Guard
- ☐ RCY — Cylinder Shade
- ☐ SSQ — Square Shade
- ☐ SHX — Hexagonal Shade

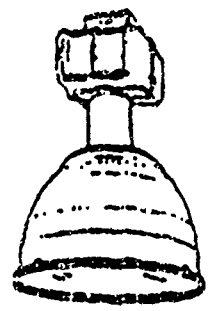
ACCESSORIES (Field Installed)
(order as separate line item)

CAT. NO.	Description
HEP	Fixture Hook - Female
LPF	Fixture Loop - Female
SCK	Safety Chain Kit
TMB	Tee Mounting Bar (consult factory)

Fixture Type

TE

METAL HALIDE
250W ENCLOSED
15' to 20' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight, die-cast aluminum with dark bronze polyester powder finish. Electrical components are opposed horizontally and heat-sinked to ballast housing for cooler operation.

BALLAST - High power factor Constant wattage autotransformer 180° class H insulation system.

OPTICS - One piece totally enclosed and gasketed Arc Tek II spun aluminum, anodized reflector combines high efficiency with extended shielding angle for high performance optical control. Gasketed clear tempered glass lens seals the entrance of ambient contaminants

INSTALLATION - Pendant space box threaded for 3/4" conduit (standard) Complete line of mounting options and accessories available.

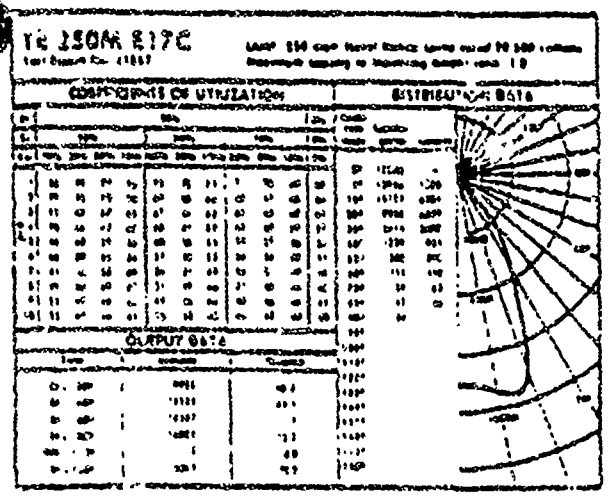
LISTING - UL 1572 listed for damp location and -30°C to 55°C ambient operation. UL wet location label option available

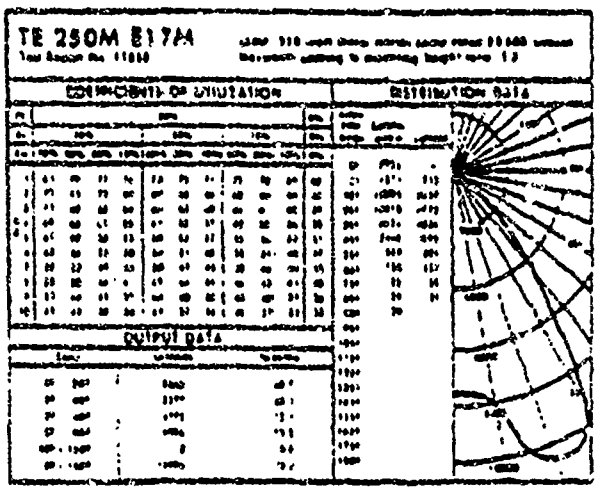
SOCKET - Porcelain, vertically oriented mogul base socket with copper alloy nickel plated screw shell and center contact. UL listed 1500W - 600V

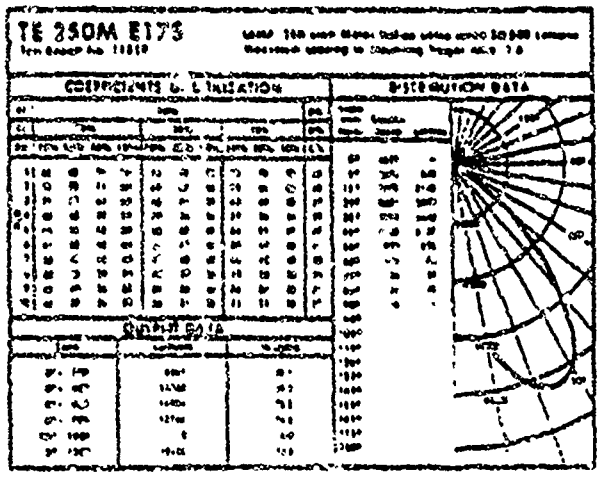
LITHONIA HI-TEK
INDUSTRIAL LOW BAY LIGHTING
A DIVISION OF LITHONIA LIGHTING

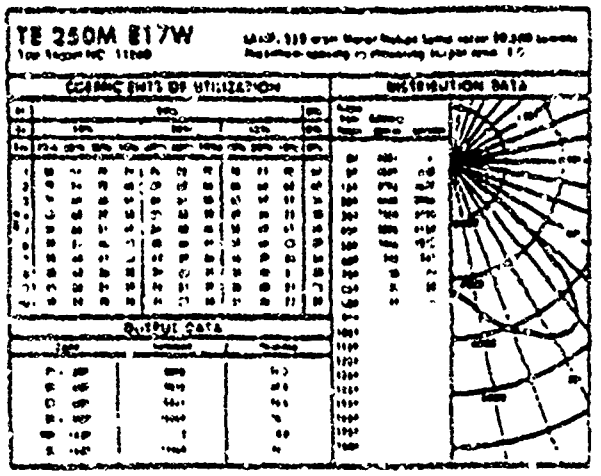
PHOTOMETRIC DATA

The charts below provide the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For complete results of any combination shown or other requirements contact your HI-TEK/LITHONIA representative.

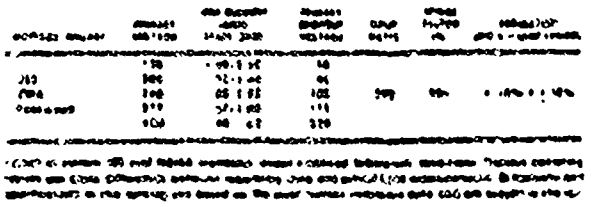








ELECTRICAL CHARACTERISTICS



LITHONIA
HI-TEK

High-Bay Industrial Lighting

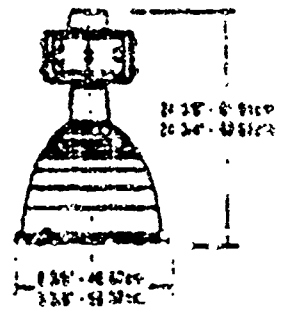
ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory Installed)

- ☐ TE 400M E22N
- ☐ TE 400M E22C
- ☐ TE 400M E17M
- ☐ TE 400M E17S
- ☐ TE 400M E17W

- ☐ 120
- ☐ 208
- ☐ 240
- ☐ 277
- ☐ 480
- ☐ TB*

N = Narrow
C = Comfortbeam
M = Medium
S = Semi-C
A = Wide-Distribution



DIST'R	SHOW
E22N	2.8
E22C	1.0
E17M	1.4
E17S	1.6
E17W	1.9

Weight: 22# (1.5 kg) Shipping
8# (3.6 kg) Net

NOTES:

* May not be ordered with 347V, 12" (8 cm) Stem.
* Not for use on 120V, 208V, 240V, 277V circuits.
* Quartz Restrike must be ordered for proper voltage rating.
* May be ordered as accessory (ADST) and installed at factory or shipped for separate installation.
* DC ballast is ordered with EB for remote battery.
* 120V ballast only.
* Not for use with WL ballast.

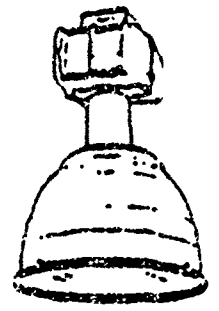
For Complete Dimensions & Application Information, See Options & Accessories Section 6.6

OPTIONS (Factory Installed)	
Shipped Installed in Fixture*	
☐ SF	Single Fuse (120-277V - no TB
☐ DF	Double Fuse (208-240-480V - no TB
☐ EC	Emergency Circuit (lamp not included)
☐ QRS*	Quartz Restrike System (lamp not included)
☐ QRSTD*	QRS Time Delay (lamp not included)
☐ HA	65°C Ambient Operation
☐ CR	Corrosion Resistant Finish (polyester)
☐ CRT	Corrosion Resistant Finish (primer)
☐ TEF	Tempered Flasher Reflector
☐ TOS*	Twist-Lock Outlet Box
☐ TOSP*	Twist-Lock Outlet Box Pigtail
☐ PSP*	Pendant Box Pigtail
☐ LCPP	Locg Cord & Plug for TPM & PPM
☐ LC3P**	Locg 3' Cord & 15A NEMA Twist-Lock Plug
☐ NC3P**	Hoga 3' Cord & 15A NEMA Twist-Lock Plug
☐ LRC6**	Locg 3' Cord & Male RCA Connector
☐ NRC6**	Hoga 3' Cord & Male RCA Connector
☐ LUCP	Locg Cord & Plug for UPM
☐ LUCP1P	LUCP w/Single Fuse Locg Cord & TB
☐ LUCP2P	LUCP w/Double Fuse Locg Cord & TB
☐ UCP	Universal Cable & Plug for UPM
☐ UCP1P	UCP w/Single Fuse Locg Cord
☐ UCP2P	UCP w/Double Fuse Locg Cord
☐ TA	Remote Ballast
☐ TACP**	TA w/Pre-Wired Cable
☐ WL	Wide Distribution UL Lens
☐ ETST	Corning CPG Pyrex Tempered Glass Lens
☐ SSS	Stainless Steel Screws
☐ SSA	Stainless Steel Screws Allen
☐ UP	UP Light
☐ CF	Coastal Pack
Shipped Separately*	
☐ W/P	Fixture Hook - Male
☐ LSSM*	Suspension Fixture Hook - Male
☐ LPM*	Pendant Locg - Male
☐ LPMS*	Suspension Pendant Locg - Male
☐ TPM*	Twist-Lock Power Male
☐ PPM*	Pendant Power Male
☐ UPM*	Universal Power Module
☐ UPM1*	UPM w/Male Adapter Plate
☐ UPM2*	UPM w/Wiring Block
☐ UPM3*	UPM w/Male Adapter Plate & Wiring Block
☐ WG	Wire Guard/Aiming Reflector
☐ LG	Louver Guard
☐ GGY	Gymnast Guard
☐ GSG	Security Guard
☐ GMZ	Mesh Metal Guard

ACCESSORIES (Field Installed) (Refer to Section 6.6 for Items)	
Cat. No.	Description
WMF	Fixture Hook - Female
LPF	Pendant Locg - Female
SCE	Safety Chain Kit
TMF	Twist-Lock Power Female Connector

TE

METAL HALIDE 400W ENCLOSED 20' to 30' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight die-cast aluminum with dark bronze polyester powder finish. Electrical components are opposed horizontally and heat-sinked to cast housing for cooler operation.

BALLAST - High power factor. Constant wattage autotransformer, 180° class H insulation system.

OPTICS - One piece totally enclosed and gasketed. Anodized aluminum specular reflector combines high efficiency with extended shielding angle for high performance critical control. Gasketed clear tempered glass lens inhibits the entrance of ambient contaminants.

INSTALLATION - Pendant splice box threaded for 3/4" conduit (standard). Consult the list of mounting options and accessories available.

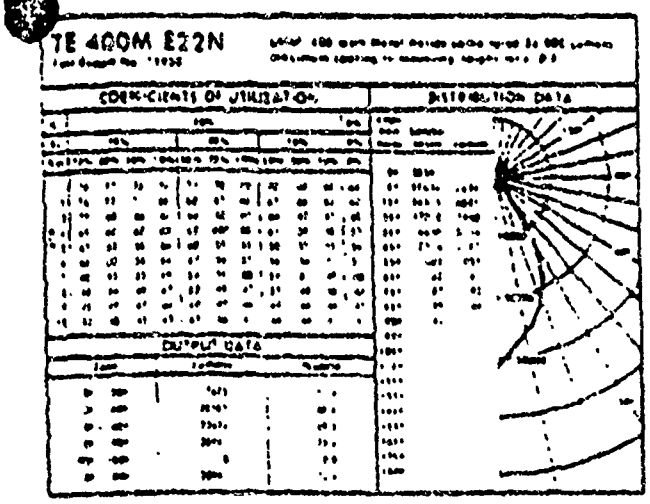
LISTING - UL 1572 listed for damp location and -30°C to 35°C ambient operation. UL wet location and option available.

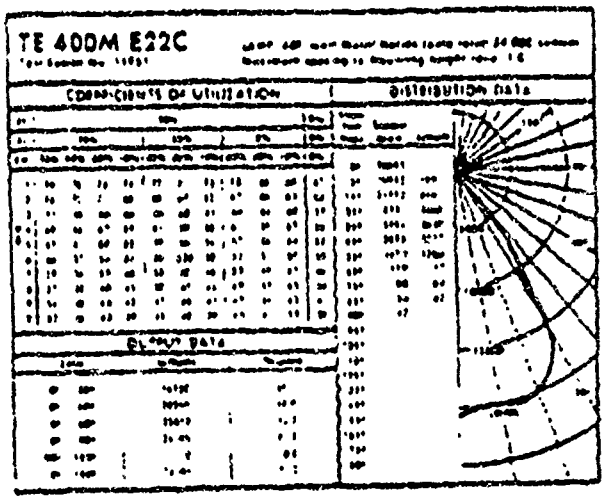
SOCKET - Porcelain vertical by one-piece mogul base socket with copper alloy nickel plated screw shell and center contact. UL listed 660W, 600V.

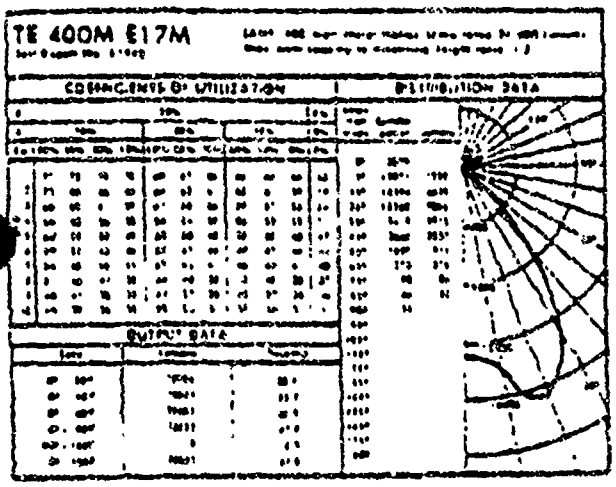
LITHONIA HI-TEK

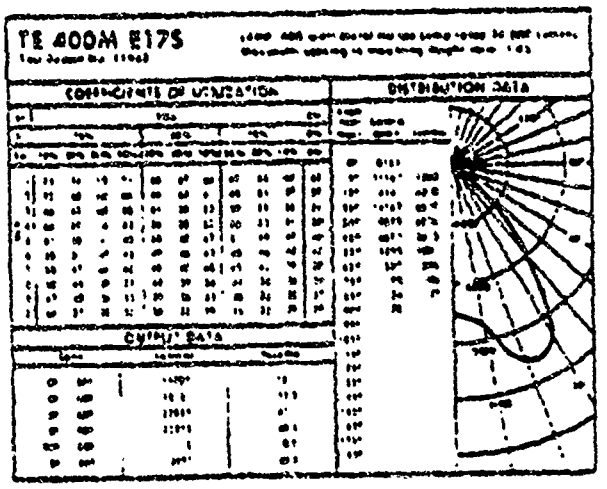
PHOTOMETRIC DATA

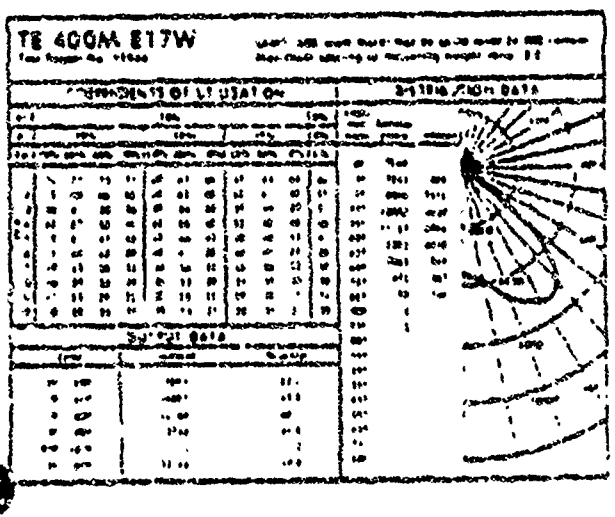
The charts below provide the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For complete results of any combination shown or other requirements, contact your NUTEK LITHONIA representative.











ELECTRICAL CHARACTERISTICS

LITHONIA Hi-TEK

Future Type

High-Bay Industrial Lighting

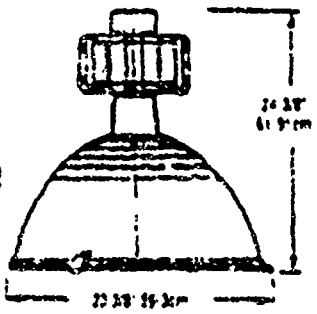
ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory Installed)

- ☐ TE 1000M E22C
- ☐ TE 1000M E22M
- ☐ TE 1000M E22S

- ☐ 120
- ☐ 208
- ☐ 240
- ☐ 277
- ☐ 480
- ☐ TP*

C = Conformal Coating
M = Medium
S = Series



DISTR	S/MH
E22C	1.3
E22M	1.3
E22S	1.6

Weight: 50lbs. 23kg

NOTES:

1. May also be ordered with 5', 10', 15' cord lengths
2. Multi-Tap Ballast (120,208 240 277V)
3. Consult lamp wattage map to achieve desired wattage rating
4. May be ordered as accessory. Visit our Industrial Accessories Brochure for ordering information.
5. "SP" use is for correct control in remote control.
6. 10 amp standard 480V
7. Non-standard distribution. Consult factory
8. Not available in MH, 3000K

For Complete Description & Application Information, See Options & Accessories Section I-O-A

SHipped Installed in Fixture

- ☐ SP — Single Fuse (120 277V) no TB
- ☐ DF — Double Fuse (208 240 480V, no TB
- ☐ EC — Emergency Circuit (lamp not included)
- ☐ QRS* — Quartz Restrike System (lamp not included)
- ☐ QRSTD* — QRS Time Delay (lamp not included)
- ☐ HA — 65°C Ambient Operation
- ☐ CR — Corrosion Resistant Finish (polyester)
- ☐ CRT — Corrosion Resistant Finish (urethane)
- ☐ TEF — Teflon Fastened Reflector
- ☐ TDP — Two-Wire Outlet Box
- ☐ TDBP — Two-Wire Outlet Box Plug-In
- ☐ PBP — Pendant Box Plug-In
- ☐ LCPP — Lead Cord & Plug for PPH & PPF
- ☐ LCDP** — Lead 3 Cord & 15A NEMA Twist-Lock Plug
- ☐ HCDP** — Hood, 3 Cord & 15A NEMA Twist-Lock Plug
- ☐ LRCA* — Lead, 3 Cord & Single RCA Connector
- ☐ HRCA** — Hood, 3 Cord & Single RCA Connector
- ☐ LUCP — Lead Cord and Plug for UPM
- ☐ LUCPSP — LUCP w/Single Fuse (Lead Mounted) no TB
- ☐ LUCPDP — LUCP w/Double Fuse (Lead Mounted) no TB
- ☐ UCP — Universal Cable & Plug for UPM
- ☐ UCPSP — UCP w/Single Fuse (Stud Mount)
- ☐ UCPDP — UCP w/Double Fuse (Stud Mount)
- ☐ TR — Remote Ballast
- ☐ TRCP** — TR w/Pre-Wired Cable
- ☐ WL — Wet Location UL Label
- ☐ C73T* — Convex CT3 Pattern Tempered Glass Lens
- ☐ SSS — Stainless Steel Screws
- ☐ SLR — Stainless Steel Lens Rings
- ☐ LP — LP Light
- ☐ CF — Chrome Finish

Shipped Separately †

- ☐ HKMP — Finish Hood - Metal
- ☐ HKMG* — Grommeted Finish Hood - Metal
- ☐ LPHP — Finish Hood - Metal
- ☐ LPMG* — Grommeted Finish Hood - Metal
- ☐ TPHP — Two-Wire Power Hood
- ☐ PPH — Pendant Power Hood
- ☐ UPHP — Universal Power Hood
- ☐ UPMK** — UPH w/Mogul Adapter Plate
- ☐ UPMKP — UPH w/Mating Plug
- ☐ UPMKP — UPH w/Mogul Adapter Plate & Mating Plug
- ☐ WG — Wire Guard Aluminum Reflector
- ☐ LC — Louver Guard
- ☐ RST — Reflector Shade
- ☐ SSD — Square Shade
- ☐ RHA — Pendant Shade

ACCESSORIES Field Installed
(order as separate line item)

Cat No	Description
PHP*	Finish Hood - Metal
LPHP	Finish Hood - Metal
SGR	Stem Gripper
TPHP	Two-Way Power Hood

TE

METAL HALIDE
1000W ENCLOSED
25' to 45' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight die-cast aluminum with dark bronze polyester powder finish. Electrical components are assembled horizontally and heat-sinked to ballast housing for cooler operation.

BALLAST - High power factor, Constant wattage autotransformer 180° class H insulation system

OPTICS - One piece totally enclosed and gasketed Art Tech II aluminum anodized reflector combines high efficiency with extended spacing/mounting height performance optical control. Gasketed clear tempered glass lens seals the entrance to ambient contaminants

INSTALLATION - Pendant supplied with threaded for 3/4" conduit (supplied). Complete line of mounting options and accessories available

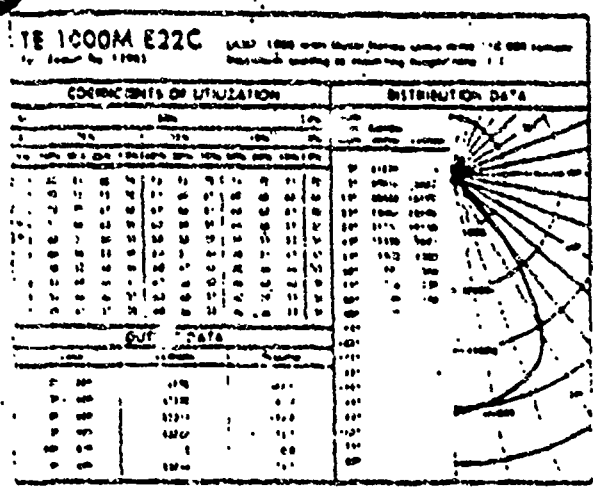
LISTING - UL 1572 listed for damp location and -30°C to 55°C ambient operation. UL wet location label option available

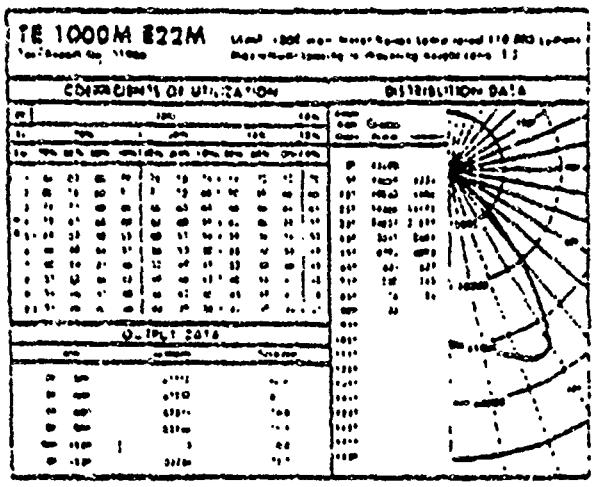
SOCKET - Porcelain vertically oriented mogul base socket with copper alloy shell plated screw shell and center contact. UL listed 1500W - 600V

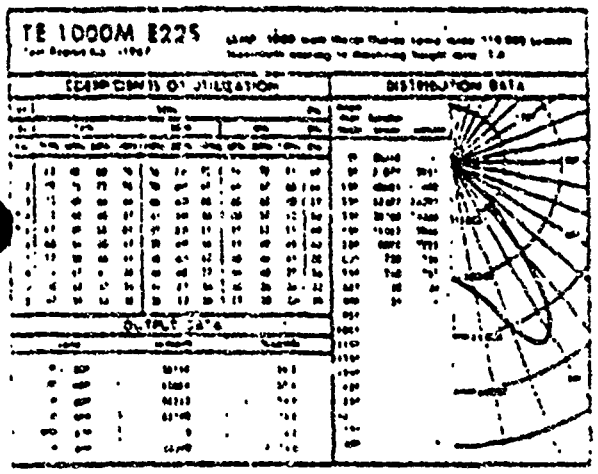
LITHONIA HI-TEK

PHOTOMETRIC DATA

The chart below provides the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For complete results of any combination shown or other requirements contact your HI-TEK LITHONIA representative.







ELECTRICAL CHARACTERISTICS

	35		1.0			
	360		1.0			
	360		1.0	0.9	90	
	360		1.0			
	400		1.0			

LITHONIA HI-TEK

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High-Bay Industrial Lighting

Fixture Type:

ORDERING SEQUENCE

CATALOG NUMBER | VOLTAGE | OPTIONS (If Any) (Included)

- ☐ TE 150S E17C
- ☐ TE 150S E17M
- ☐ TE 150S E17S
- ☐ TE 150S E17W

- ☐ 120*
- ☐ 208
- ☐ 240
- ☐ 277*
- ☐ 480
- ☐ TLV*

Shipped Installed in Fixture

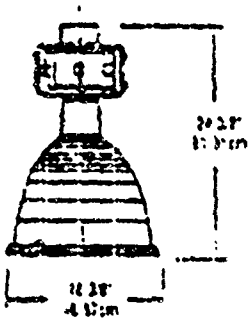
☐	SF	Single Fuse (120,277V) no PB
☐	DF	Double Fuse (208,240,480V) no PB
☐	EC	Emergency Circuit (lamp not included)
☐	ORS*	Quartz Restrike System (lamp not included)
☐	ORSTD*	ORS Time Delay (lamp not included)
☐	HA	55°C Ambient Operation
☐	CR	Corrosion Resistant Finish (polyester)
☐	CRF	Corrosion Resistant Finish (epoxy)
☐	PEF	Tempered Reflector
☐	TCB*	Twist-Lock Cord Set
☐	TCBP*	Twist-Lock Cord Set Plug Only
☐	PMP*	Pendant Box Plug-In
☐	LCPP*	Locc Cord & Plug for PMH & PSH
☐	LCSP**	Locc 3 Cord & 15A NEMA Twist-Lock Plug
☐	KCSP**	Locc 3 Cord & 15A NEMA Twist-Lock Plug
☐	LRCA**	Locc 3 Cord & Female RCA Connector
☐	MRCA**	Locc 3 Cord & Male RCA Connector
☐	LUCP*	Locc Cord and Plug for UPM*
☐	LUCPSF*	LUCP w/Single Fuse (Does not include PB)
☐	LUCPDF*	LUCP w/Double Fuse (Does not include PB)
☐	UCP*	Universal Cable & Plug for UPM
☐	UCPSF*	UCP w/Single Fuse (Does not
☐	UCPDF*	UCP w/Double Fuse (Does not
☐	TR	Remote Ballast
☐	TRCP**	TR w/Power Wire Cable
☐	WL	Wire Locator (UL Label
☐	CTDT*	Coloring DT3 Pattern Tempered Glass Lens
☐	SSS	Stainless Steel Screws
☐	SLR	Stainless Steel Lens Rings
☐	UP	U* Hanger
☐	CP	Chain Set* for
☐	MRB	Magnetic Replacement Ballast
☐	CWA	Constant Wattage Autotransformer

Shipped Separately*

☐	MPM*	Pendant Box - Metal
☐	MPMG*	Grommeted Pendant Box - Metal
☐	LPMP*	Pendant Box - Metal
☐	LPMGP*	Grommeted Pendant Box - Metal
☐	*PMP	Thru-Wire Power Hook
☐	PPMP	Pendant Power Hook
☐	UPMP*	Universal Power Mount for UPM
☐	UPMA*	UPM w/Right Angle Plate
☐	UPMS*	UPM w/Swing Plate
☐	UPMB*	UPM w/Back Support Plate & Swing Plate
☐	WG	Wire Guard & Lamp Rim Retainer
☐	LG	Louver Guard
☐	DCP	Chrome Socket
☐	CSG	Square Shade
☐	SHE	Porcelain Shade

ACCESSORIES (Field Install)
(Order as separate line item)

Catalog	Description
MBP*	Surface Box - Female
LPB*	Surface Box - Female
SCR	Safety Chain Kit
TMB	Tamper Mounting for Mounting Bracket



DIM "A"	S.M.H.
E17C	15'
E17M	13'
E17S	16'
E17W	19.5'

Weight: 20 lbs. (9kg)

NOTES:

1. May also be ordered with 5', 10', 15' cord lengths.
2. Use Tap Ballast (120,208,240,277V).
3. Quartz lamp wattage rating to match ballast rating.
4. May be ordered as accessory. MUST see Accessories Sheet for ordering information.
5. Available to convert to Twist-Lock receptacle.
6. 20 amp standard (15A).
7. Shipped with Bushing (120,277V). Bushing when ordered as 208 or 240V, replace with PMP for PA.
8. Not available with Wire Guard.
9. May change due to lamp availability.

For Complete Description & Application Information See Options & Accessories Sheet H-6A.

TE

HIGH PRESSURE SODIUM
150W ENCLOSED
12' to 20' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight, die-cast aluminum with dark bronze polyester powder finish. Electrical components are opposed horizontally and heat-sinked to ballast housing for cooler operation.

BALLAST - High reactance high power factor. 180°C class H insulation system.

OPTICS - One piece totally enclosed and gasketed Ore Tek II semi aluminum anodized reflector combines high efficiency with extended shielding angle for high performance optical control. Exclusive during design maximizes arc tube voltage rise. Gasketed clear tempered glass lens resists the entrance of ambient contaminants.

INSTALLATION - Pendant splice box mounted for 3/4" conduit (standard). Complete line of mounting options and accessories available.

LISTING - UL 1572 listed for damp location and -30°C to 55°C ambient operation. UL and optional label option available.

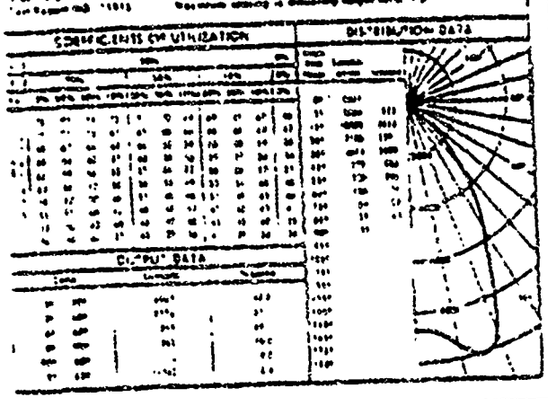
SOCKET - Porcelain vertically oriented mogul base socket with copper alloy nickel plated screw shell and center contact. UL listed 150OW - 600V.

LITHONIA HI-TEK
COMMERCIAL OUTDOOR LIGHTING
A Division of Lithonia Lighting

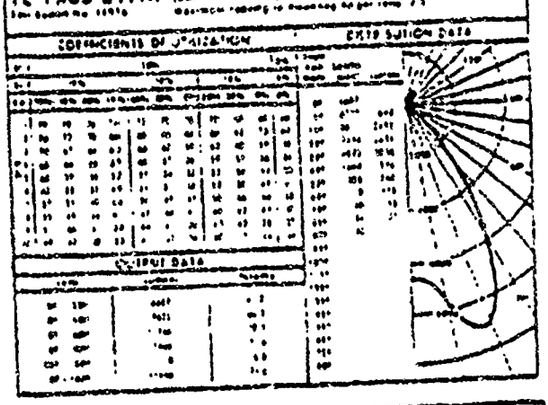
PHOTOMETRIC DATA

The charts below provide the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For [illegible] results of any combination shown or other requirements, contact your HI-TEK LITHONIA representative.

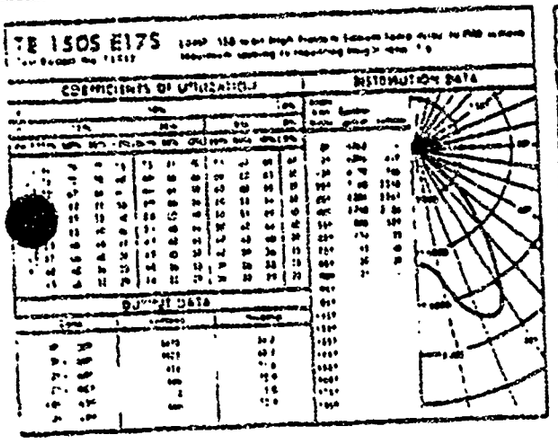
TE 150S E17C



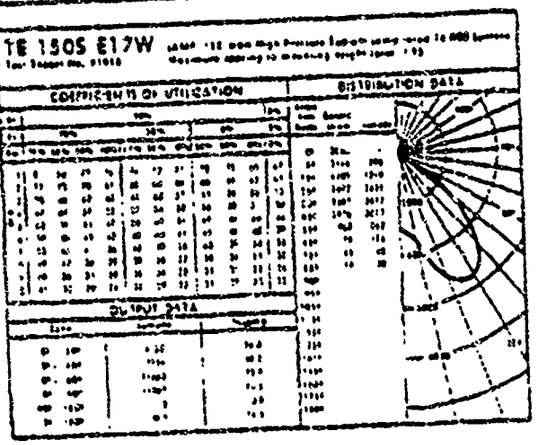
TE 150S E17M



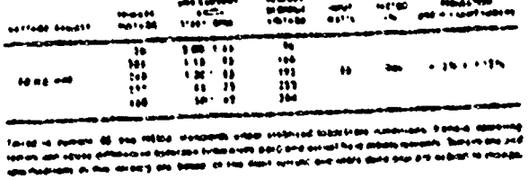
TE 150S E17S



TE 150S E17W



ELECTRICAL CHARACTERISTICS



LITHONIA HI-TEK
INDUSTRIAL OUTDOOR LIGHTING

Fixture Type:

High-Ray Industrial Lighting

ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory Installed)

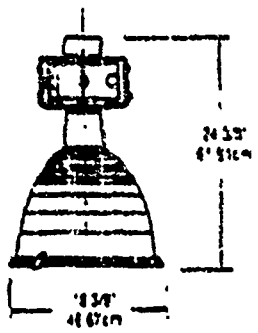
- ☐ TE 200S E17N
- ☐ TE 200S E17C
- ☐ TE 200S E17M
- ☐ TE 200S E17S
- ☐ TE 200S E17W

N = Narrow
C = Concentrating
M = Medium
S = Spread
W = Wide Spread

- ☐ 120
- ☐ 208
- ☐ 240
- ☐ 277
- ☐ 480
- ☐ TB*

Shipped Installed in Fixture

- ☐ SF — Single Fuse (120-277V) w/o TB
- ☐ DF — Double Fuse (208-240-480V) w/o TB
- ☐ EC — Emergency Circuit (lamp not included)
- ☐ GRS* — Guard Restrike System (lamp not included)
- ☐ GRSTD* — GRS Time Delay (lamp not included)
- ☐ HA — 65°C Ambient Operation
- ☐ CR — Corrosion Resistant Finish (polyester)
- ☐ CRT — Corrosion Resistant Finish (epoxy)
- ☐ TEF — Tempered Reflector
- ☐ TOB* — Thru-Wire Outlet Box
- ☐ TOBP* — Thru-Wire Outlet Box Plug-In
- ☐ PBP* — Pendant Box Plug-In
- ☐ LCP* — Loose Cord & Plug for TPH & PPH
- ☐ LCP** — Loose 3' Cord & 15A NEMA Twist Lock Plug
- ☐ HCP** — Hard 3' Cord & 15A NEMA Twist Lock Plug
- ☐ LRCA** — Loose 3' Cord & Male RCA Connector
- ☐ HRCA** — Hard 3' Cord & Male RCA Connector
- ☐ LUCP* — Loose Cord and Plug for UPM1
- ☐ LUCPSF* — LUCP w/Single Fuse (loose mounted in TB
- ☐ LUCPDF* — LUCP w/Double Fuse (loose mounted in TB
- ☐ UCP* — Universal Cable & Plug-In UPM
- ☐ UCPSF* — UCP w/Single Fuse (loose item)
- ☐ UCPDF* — UCP w/Double Fuse (loose item)
- ☐ TR — Remote Ballast
- ☐ TRCP3*** — TR w/Pre-Wired Cable
- ☐ WL — Wire Location U. Label
- ☐ CT37* — Corning CT3 Pattern Tempered Glass Lens
- ☐ SSS — Stainless Steel Screws
- ☐ SLR — Stainless Steel Latch Rings
- ☐ UP — UP Light
- ☐ CF — Ceramic Filter



DISTR	SMH
E17N	.79
E17C	1.17
E17M	1.37
E17S	1.54
E17W	1.53

Weight 22 lbs 7 oz.

NOTES:

1. May also be ordered with 5', 10', 15' cord lengths
2. Multi-Tap Ballast (120-208-240-277V)
3. Quartz lamp voltage will be reset; ballast voltage rating
4. May be ordered as accessory MLCT; see Industrial Accessories Sheet for ordering information
5. 35' cable to connect ballast to remote ballast
6. 30 amp standard 480V
7. May change E distribution. Consult factory
8. Not available with WL option

Shipped Separately*

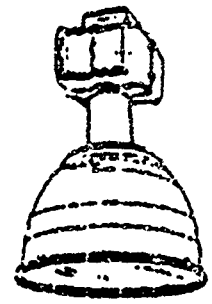
- ☐ NEMP — Fixture Mast - Male
- ☐ NEMG* — Grommeting Fixture Mast - Male
- ☐ LPMP — Fixture Lens - Male
- ☐ LPMG* — Grommeting Fixture Lens - Male
- ☐ TPHP — Thru-Wire Power Hook
- ☐ PPHP — Pendant Power Hook
- ☐ UPMP — Universal Power Module
- ☐ UPM1* — UPM w/Mogul Socket Base
- ☐ UPM2* — UPM w/Wiring Block
- ☐ UPM3* — UPM w/Mogul Socket Base & Wiring Block
- ☐ WG — Wire Guard/Aluminum Reflector
- ☐ LG — Louver Guard
- ☐ CCY — Cylinder Shade
- ☐ CSD — Square Shade
- ☐ CHX — Hexagonal Shade

ACCESSORIES (Field Installed)
(order as separate line item)

Cat No	Description
NEMP	Fixture Mast - Female
LPMP	Fixture Lens - Female

TE

HIGH PRESSURE SODIUM 200W ENCLOSED 15' to 20' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight, die-cast aluminum with dark bronze polyester powder finish. Electrical components are assembled horizontally and heat-sinked to ballast housing for cooler operation.

BALLAST - High power factor Constant wattage autotransformer, 180° class H insulation system.

OPTICS - One piece totally enclosed and gasketed Alzak® anodized aluminum, air-formed reflector combines high efficiency with tailored shielding angle for high uniformity and glare control. Exclusive fluting design minimizes end-of-lamp voltage rise. Gasketed clear tempered glass lens inhibits the entrance of ambient contaminants.

INSTALLATION - Pendant splice box with 3/4" conduit knockouts standard. Complete mounting options and accessories available.

LISTING - UL 1572 listed for damp locations -30°C to 55°C ambient operation. Indoor/outdoor location rated option available.

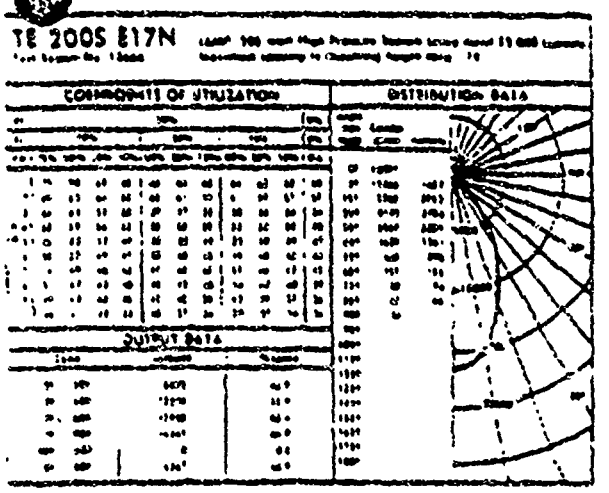
SOCKET - Porcelain, vertically oriented base socket with copper alloy nickel plated screw shell and center contact. UL listed 750W-600V.

LITHONIA HI-TEK
INDUSTRIAL OUTDOOR LIGHTING
A Division of Lithonia, Inc.

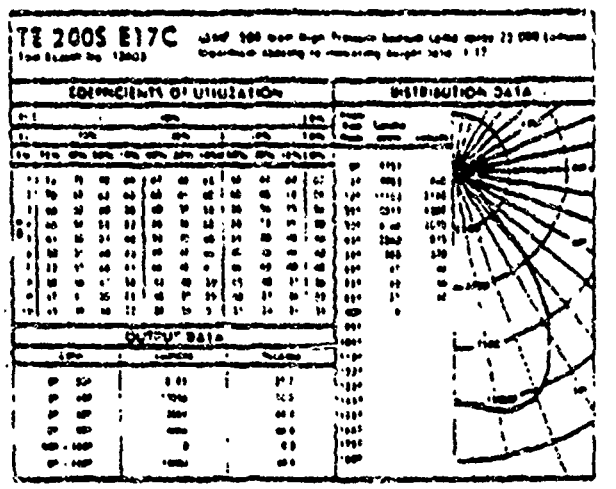
PHOTOMETRIC DATA

The charts below provide the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For [illegible] results of any combination shown, or other requirements, contact your HI-TEK LITHONIA representative.

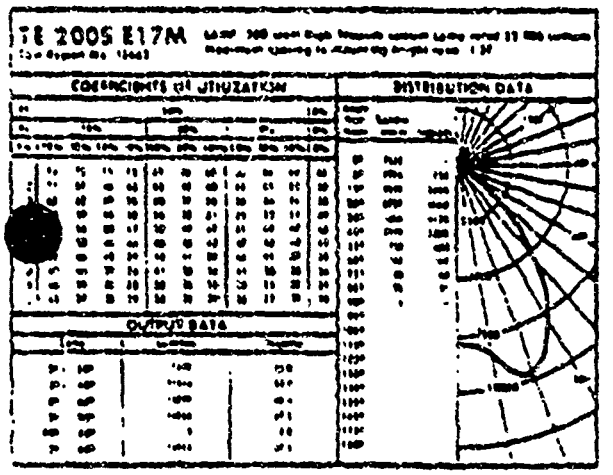
TE 200S E17N



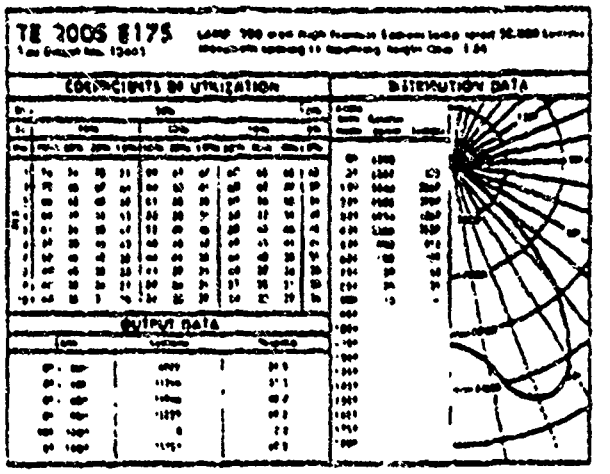
TE 200S E17C



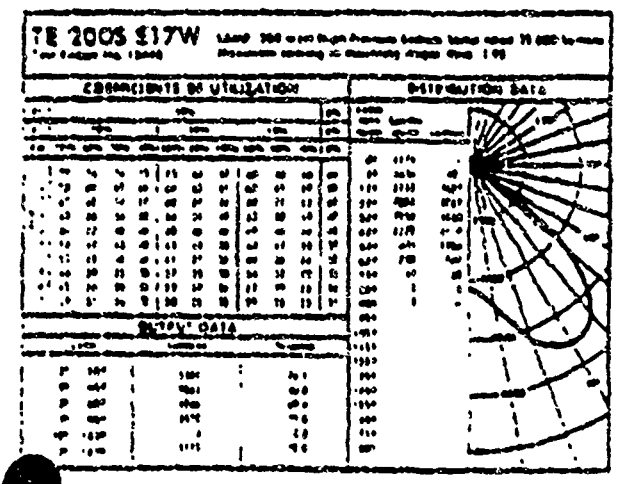
TE 200S E17M



TE 200S E17S



TE 200S S17W



ELECTRICAL CHARACTERISTICS

	120					
	208					
	240					
	277					
	480					

LITHONIA HI-TEK

INDUSTRIAL OUTDOOR LIGHTING

High-Bay Industrial Lighting

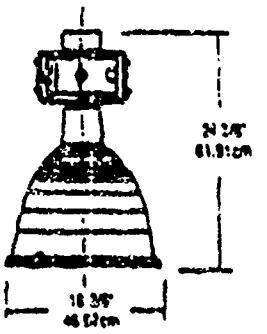
ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory Installed)
✓	✓	✓

- ❑ TE 250 S E17N
- ❑ TE 250 S E17C
- ❑ TE 250 S E17M
- ❑ TE 250 S E17S
- ❑ TE 250 S E17W

- ❑ 120
- ❑ 208
- ❑ 240
- ❑ 277
- ❑ 480
- ❑ TP[1]

N = Narrow
C = Concentrating
M = Medium
S = Spread
W = Wide spread



DISTR.	S/MH
E17N	.79
E17C	1.17
E17M	1.37
E17S	1.34
E17W	1.93

Weight 25lbs./10kg.

NOTES:
[1] May also be ordered with 5', 10', 15' cord lengths.
[2] Multi-Tap Ballast (120,208,240,277V)
[3] Quartz lamp wattage not to exceed ballast wattage rating
[4] May be ordered as accessory. MUST see Industrial Accessories Sheet for ordering information.
[5] 35' cable to connect sensor to remote ballast.
[6] 20 amp standard 480V
[7] May change distribution. Consult factory.
[8] Not available in WL option

For Complete Description & Application

Skipped Items Noted in Fixture

- ❑ SF — Single Fuse (120,277V) n/a TP
- ❑ DF — Double Fuse (208,240,480V) n/a TP
- ❑ EC — Emergency Circuit (lamp not included)
- ❑ GRS[2] — Guard Restrike System (lamp not included)
- ❑ GRSTD[2] — GRS Time Delay (lamp not included)
- ❑ HA — 65°C Ambient Operation
- ❑ CR — Corrosion Resistant Finish (polyester)
- ❑ CRT — Corrosion Resistant Finish (teflon)
- ❑ TEF — Teflon Finished Reflector
- ❑ TOG[3] — Thru-Wire Outlet Box
- ❑ TOGP[3] — Thru-Wire Outlet Box Plug-in
- ❑ PBP[3] — Pendant Box Plug-in
- ❑ LCPP[3] — Loop Cord & Plug for TPH & PPH
- ❑ LC3P[3,4] — Loop, 3' Cord & 15A NEMA Twist Lock Plug
- ❑ MC3P[3,4] — Mog. 3' Cord & 15A NEMA Twist Lock Plug
- ❑ LRCA[3] — Loop, 3' Cord & Resist RCA Connector
- ❑ MRCA[3] — Mog. 3' Cord & Resist RCA Connector
- ❑ LUCP[3] — Loop Cord and Plug for UPM
- ❑ LUCPSP[3] — LUCP w/Single Fuse (load mon) n/a TP
- ❑ LUCPDP[3] — LUCP w/Double Fuse (load mon) n/a TP
- ❑ UCP[3] — Universal Cable & Plug for UPM
- ❑ UCPSP[3] — UCP w/Single Fuse (load mon)
- ❑ UCPDP[3] — UCP w/Double Fuse (load mon)
- ❑ TR — Remote Ballast
- ❑ TRCP[3,5] — TR w/Pre-Wired Cable
- ❑ WL — Wet Location "L" Label
- ❑ CT3T — Corning 3/3 Pyrex Tempered Glass Lens
- ❑ SSX — Stainless Steel Screws
- ❑ SLR — Stainless Steel Lens Rings
- ❑ UP — UP Light
- ❑ CF — Charcoal Filter
- ❑ MRB — Magnetic Regulator Ballast

Shipped Separately [6]

- ❑ MEM[7] — Fixture Mogul - Male
- ❑ MEMG[7] — Grommeted Fixture Mogul - Male
- ❑ LPM[7] — Fixture Loop - Male
- ❑ LPMG[7] — Grommeted Fixture Loop - Male
- ❑ TPH[7] — Thru-Wire Power Head
- ❑ PPH[7] — Pendant Power Head
- ❑ UPM[7] — Universal Power Module
- ❑ UPMA[7] — UPM w/Mogul Adapter Plate
- ❑ UPMW[7] — UPM w/Wiring Block
- ❑ UPMAW[7] — UPM w/Mogul Adapter Plate & Wiring Block
- ❑ WG — Wire Guard/Aluminum Reflector
- ❑ LG — Lower Guard
- ❑ CYL — Cylinder Shade
- ❑ SQU — Square Shade
- ❑ HEX — Hexagonal Shade

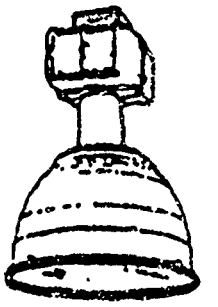
ACCESSORIES (Field Installed)
(order as separate line item)

Cat. No.	Description
MEP[7]	Fixture Mogul - Female
LPP[7]	Fixture Loop - Female
GGG	Guard Cage Kit

Fixture Type

TE

HIGH PRESSURE SODIUM 250W ENCLOSED 18' to 25' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight, die-cast Aluminum with dark bronze polyester powder finish. Electrical components are opposed horizontally and heat-sinked to ballast housing for cooler operation.

BALLAST - High power factor. Constant wattage autotransformer. 180° class H insulation system.

OPTICS - One piece totally enclosed and gasketed Arc Tek II spun aluminum, anodized reflector combines high efficiency with extended shielding angle for high performance optical control. Exclusive fluting design minimizes arc tube voltage rise. Gasketed clear tempered glass lens elevates the entrance of ambient contaminants.

INSTALLATION - Pendant splice box threaded for 3/4" conduit (standard). Complete line of mounting options and accessories available.

LISTING - UL 1572 listed for damp location and -30°C to 55°C ambient operation. UL wet location label option available.

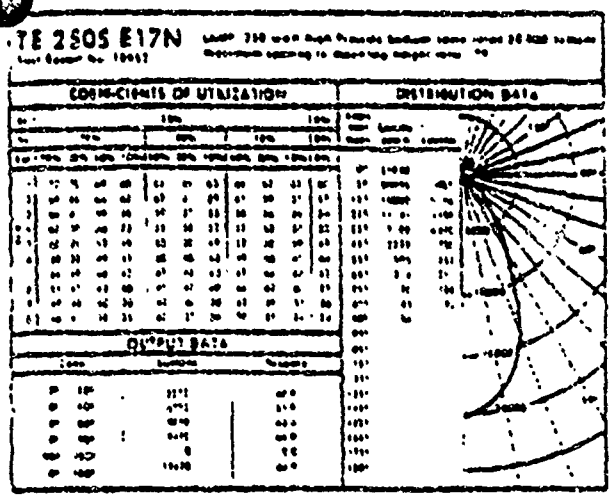
SOCKET - Porcelain vertically oriented mogul base socket with copper alloy nickel plated screw shell and center contact. UL listed 1500W- 600V

LITHONIA HI-TEK
INDUSTRIAL OUTDOOR LIGHTING
A Division of Lithonia Lighting

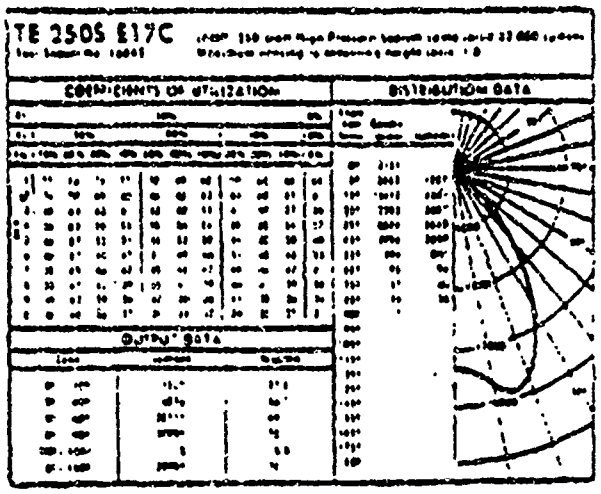
PHOTOMETRIC DATA

The charts below provide the most useful data from specific photometric tests of the spec'd light sources and distribution patterns shown. For complete results of any combination shown or other requirements, contact your HI-TEK LITHONIA representative.

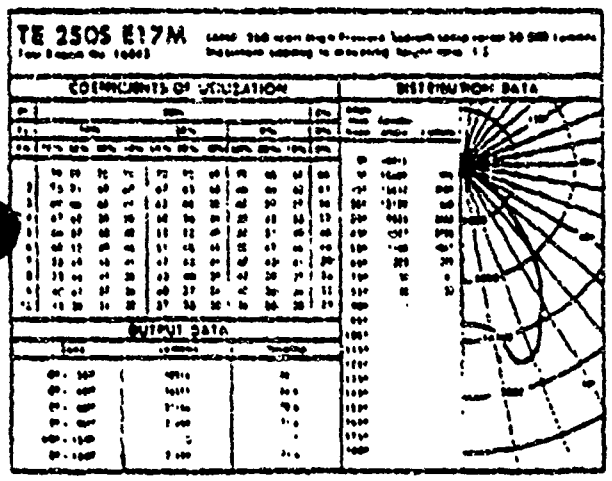
TE 2505 E17N



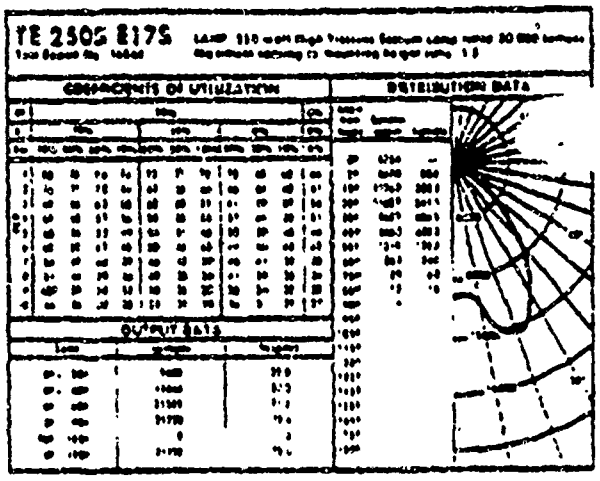
TE 2505 E17C



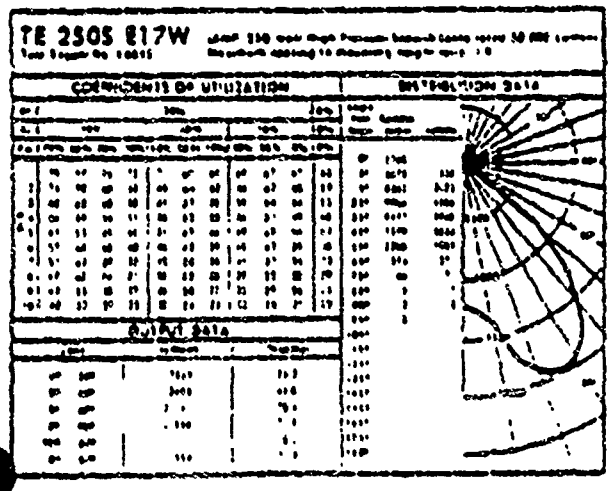
TE 2505 E17M



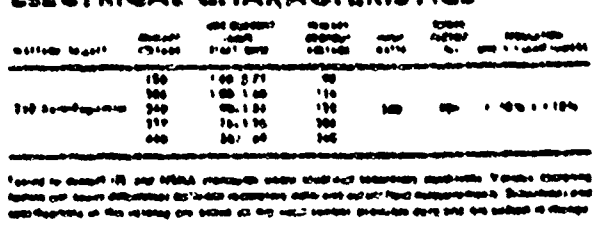
TE 2505 E17S



TE 2505 E17W



ELECTRICAL CHARACTERISTICS



High-Bay Industrial Lighting

ORDERING SEQUENCE

CATALOG NUMBER	VOLTAGE	OPTIONS (Factory Installed)

- ☐ TE 400S E22N
- ☐ TE 400S E22C
- ☐ TE 400S E17M
- ☐ TE 400S E17S
- ☐ TE 400S E17W

- ☐ 120
- ☐ 208
- ☐ 240
- ☐ 277
- ☐ 480
- ☐ TB*

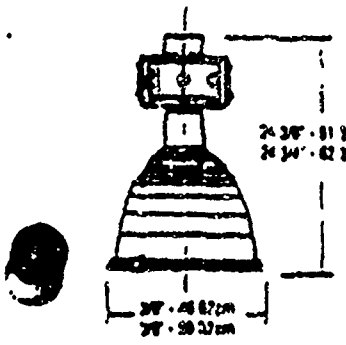
N = Narrow
C = Concentrating
M = Medium
S = Spread
W = Wide Spread

Shipped Installed in Fixture

- ☐ SF — Single Fuse (120-277V, n/a TB
- ☐ DF — Double Fuse (208-240-480V, n/a TB
- ☐ EC — Emergency Circuit (lamp not included)
- ☐ ORS* — Ozone Resistive System (lamp not included)
- ☐ ORSTD* — ORS Time Delay (lamp not included)
- ☐ HA — 65°C Ambient Operation
- ☐ CR — Corrosion Resistant Finish (polyester)
- ☐ CRT — Corrosion Resistant Finish (teflon)
- ☐ TEF — Teflon Finished Reflector
- ☐ TOB* — Thru-Wire Outlet Box
- ☐ TOBP* — Thru-Wire Outlet Box Plug-in
- ☐ PBP* — Pendant Box Plug-in
- ☐ LCPP* — Loop, Cord & Plug for TPH & PPH
- ☐ LC3P*,** — Loop, 3' Cord & 15A NEMA Twist Lock Plug
- ☐ HC3P*,** — Hook, 3' Cord & 15A NEMA Twist Lock Plug
- ☐ LRCA*,** — Loop, 3' Cord & Recp. RCA Connector
- ☐ HRCA*,** — Hook, 3' Cord & Recp. RCA Connector
- ☐ LUCP* — Loop Cord and Plug for UPM
- ☐ LUCPSP — LUCP w/Single Fuse (loop front) n/a TB
- ☐ LUCPDP — LUCP w/Double Fuse (loop front) n/a TB
- ☐ UCP* — Universal Cable & Plug for UPM
- ☐ UCPSP — UCP w/Single Fuse (loop front)
- ☐ UCPDP — UCP w/Double Fuse (loop front)
- ☐ TR — Remote Ballast
- ☐ TRCP*,** — TR w/Pre-Wired Cable
- ☐ WL — Wet Location UL Label
- ☐ 6731* — Corning CPO Pattern Tempered Glass Lens
- ☐ SSS — Stainless Steel Screws
- ☐ SLR — Stainless Steel Lens Rings
- ☐ UP — UP Light
- ☐ CF — Charcoal Filter
- ☐ MRB — Magnetic Regulator Ballast

Shipped Separately *

- ☐ MEMP — Future Mogul - Male
- ☐ MEMG* — Grommeted Future Mogul - Male
- ☐ LPMP — Future Loop - Male
- ☐ LPMG* — Grommeted Future Loop - Male
- ☐ TPMP — Thru-Wire Power Mogul
- ☐ PPMP — Pendant Power Mogul
- ☐ UPMP — Universal Power Module
- ☐ UPM1* — UPM w/Recp. Adapter Plate
- ☐ UPM2* — UPM w/Wiring Block
- ☐ UPM3* — UPM w/Recp. Adapter Plate & Wiring Block
- ☐ WG — Wire Guard/Aluminum Reflector
- ☐ LG — Louver Guard
- ☐ SCY — Cylinder Shade
- ☐ SSQ — Square Shade
- ☐ SHX — Hexagonal Shade



DISTR.	SAMN
E22N	0.8
E22C	1.1
E17M	1.25
E17S	1.5
E17W	1.9

Weight: E22 41lbs/18kg
E17 39.5lb/18kg

NOTES:

1. May also be ordered with 5', 10', 15' cord lengths.
2. Multi-Tap Ballast (120,208,240,277V).
3. Quartz lamp wattage not to exceed ballast wattage rating.
4. May be ordered as accessory MUST see Industrial Accessories Sheet for ordering information.
5. 38" cable to connect fixture to remote ballast.
6. 20 amp standard 480V
7. May change configuration. Consult factory.
8. Not available with option

For Complete Description & Ordering Information, See Options & Accessories Sheet I-O/A.

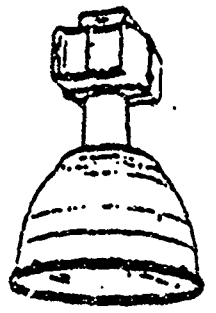
ACCESSORIES (Field Installed)
(order as separate line item)

Cat. No.	Description
MEP	Future Mogul - Female
LPP	Future Loop - Female
SCY	Safety Cage (1)
TMB	Two Mounting Bar Combo (Universal)

Fixture Type

TE

HIGH PRESSURE SODIUM
400W ENCLOSED
20' to 30' Mounting



SPECIFICATIONS

HOUSING - Rugged, lightweight, die-cast aluminum with dark bronze polyester powder finish. Electrical components are opposed horizontally and heat-sinked to ballast housing for cooler operation.

BALLAST - High power factor. Constant wattage autotransformer, 180° class H insulation system.

OPTICS - One piece totally enclosed and gasketed Arc Tek II span aluminum, anodized reflector combines high efficiency with extended shielding angle for high performance optical control. Exclusive fixture design minimizes arc tube voltage rise. Gasketed cast tempered glass lens inhibits the entrance of ambient contaminants.

INSTALLATION - Pendant splice box (tread for 3/4" conduit (standard). Complete line of mounting options and accessories available.

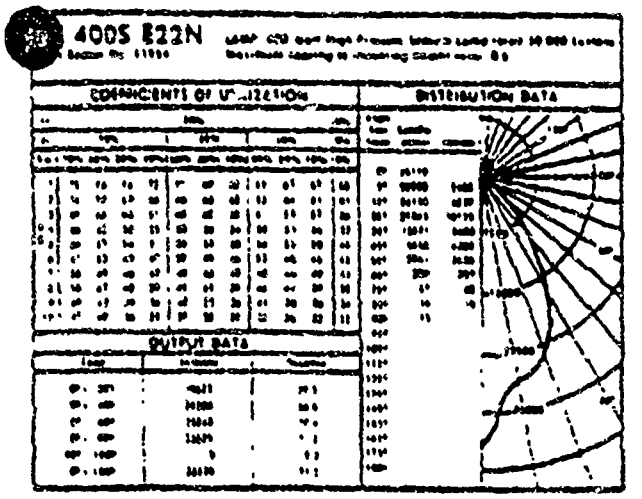
LISTING - UL 1572 listed for damp location and -30°C to 55°C ambient operation. UL wet location label option available.

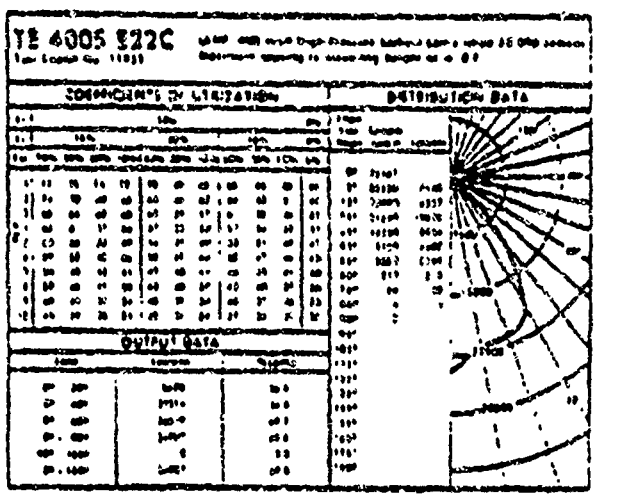
SOCKET - Porcelain, vertically oriented mogul base socket with copper alloy nickel plated screw shell and center contact. UL listed 150CW - 600V

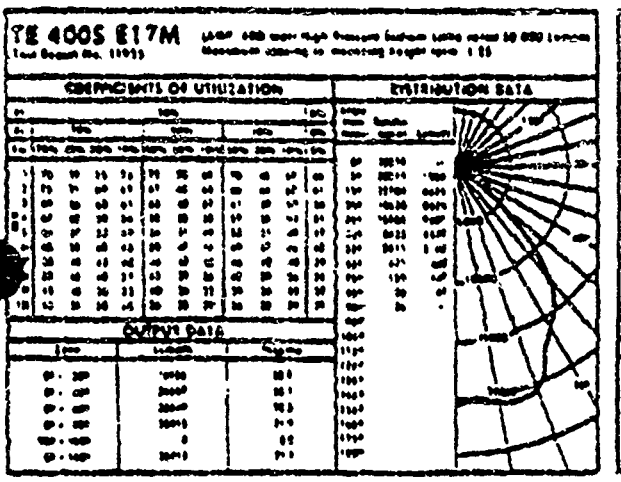
LITHONIA HI-TEK
INDUSTRIAL OUTDOOR LIGHTING

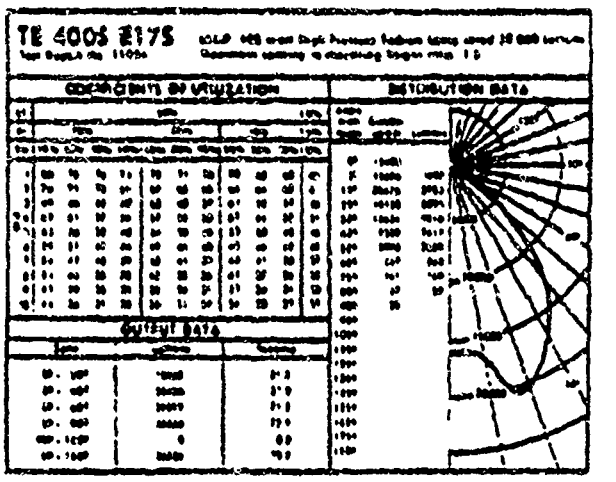
PHOTOMETRIC DATA

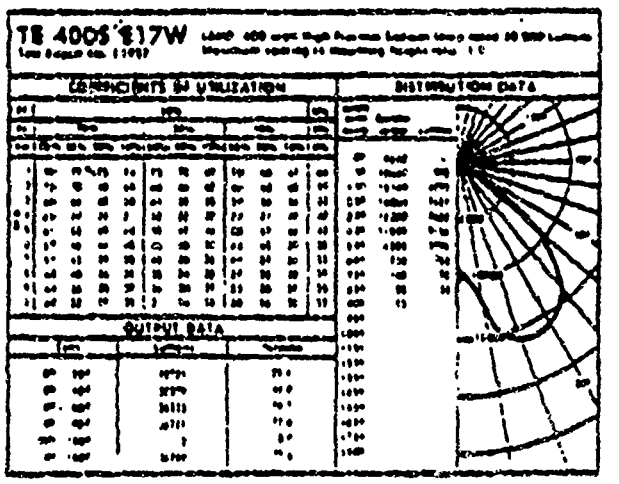
The charts below provide the most useful data from specific photometric tests of the specific light sources and distribution patterns shown. For complete results of any combination shown or other requirements contact your HI-TEK / LITHONIA representative.











ELECTRICAL CHARACTERISTICS

LITHONIA HI-TEK
INDUSTRIAL OUTDOOR LIGHTING

NRG®-300 Series

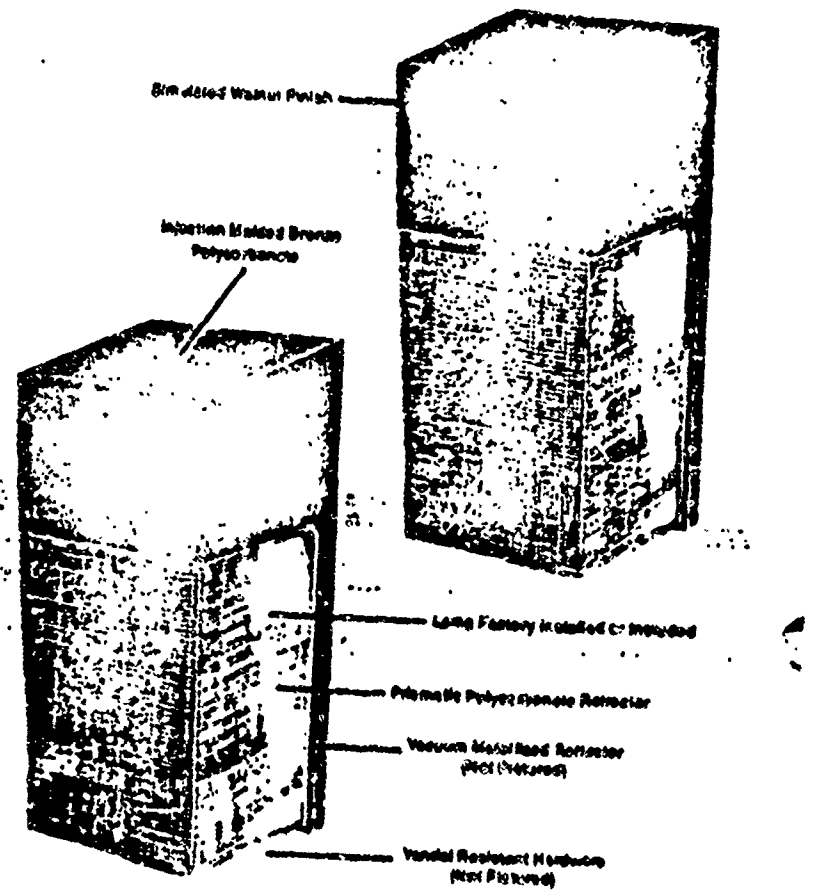
PERIMALUX

Hubbell Lighting's PERIMALUX™ Series is the ultimate in low wattage wall mount luminaires. It combines aesthetics and functional lighting in a compact, energy-efficient luminaire designed for today's marketplace.

With an all-polycarbonate housing and lens assembly, the Perimalux lighting fixture provides beauty and vandal resistance for safety and security lighting. Its unique optical design provides excellent uniform illumination at mounting heights of 6 - 12 feet with a spacing-to-mounting height ratio of 6 - to - 1 when utilizing a 50 or 70 watt high pressure sodium lamp, and a 4 - to - 1 ratio when using a 26-watt fluorescent lamp. This luminaire is the ideal energy efficient answer for both new construction or retrofitting incandescent luminaires. For areas where an instant-on fixture is required for only short burning hours, the Perimalux luminaire is once again the answer with lamp wattages up to 60 watt incandescent.

The Perimalux series is available with your choice of either bronze polycarbonate or woodgrain finish. The woodgrain finish is a state-of-the-art process which allows the user a more decorative approach.

Additionally, Hubbell Lighting's Perimalux series provides the first of its kind fluorescent cold weather starting with the new 26 watt Quad lamp. This luminaire is ideal for areas requiring high lighting levels with an instant-on cool white fluorescent source.



Features:

Housing — One-piece, injection molded bronze polycarbonate. Permanent color with textured finish. Two point mounting prevents luminaire rotation.

Reflector — Internal reflector is vacuum metallized aluminum with a sure protective coating which provides a minimum of 85% reflectivity and 80% specularity. Seventy-watt HPS model features a white Lektrocoat® finish for low brightness and excellent uniformity.

Reflector — U.V. stabilized prismatic polycarbonate provides low brightness and high spacing-to-mounting height ratios 6 - to - 1 for 50, and 70 watt HPS, 4 - to - 1 for 26 watt fluorescent. This unique design punches the light sideto-side while bending the light 15° below horizontal for reduced glare.

Lamp — HPS factory installed S-17 clear medium base and fluorescent includes Quad tube lamp.

Ballast — HPS Cans-ine normal power factor reactor, -40°F starting 50 Hz. Quad Fluorescent Auto-sp normal power factor, -20°F to 80°F starting.

Vandal Resistant Set Screw — Retains reflector and protects lamp from vandalism.

Woodgrain Finish — Walnut grain finish is available on selected unit. Simulated wood finish is genetically bonded to the housing unit using the most current high technology processes.

Other Features — UL listed suitable for wet locations. . Easily to most any standard four inch, round junction box. Accessory surface conduit mounting box. . Optional photocontrol. . All weather gasketing . . . ideal for indoor or outdoor applications.

Ordering Information

Catalog Number	Watts	Voltage	Ballast Type	Weight (lbs)	Weight (kgs)
HIGH PRESSURE SODIUM					
HRG-361*	70	277	Reactor/HPF	3	1.4
HRG-362*	50	120	Reactor/HPF	4	1.8
FLUORESCENT					
HRG-364-4**	26	120	Autotransformer	3½	1.6
INCANDESCENT					
HRG-365	50 lamps	120	—	2.2	1.0

*Includes Fusion, Series 8 1/2". Does not include base unit.
**Includes Fusion Quad.

Options

The following factory applied options are available on the HRG 300 series. Order each fixture by adding suffix.

Suffix	Description
— PC*	Photocontrol, Button Type (120 Volt)
— HO**	Oscillator Base

*Add one each of Photocontrol and Socket.
**Add one each of HRG 365 Lamp and Oscillator Base.

Accessory

For one mast arm with HRG-300 Series. Order separately.

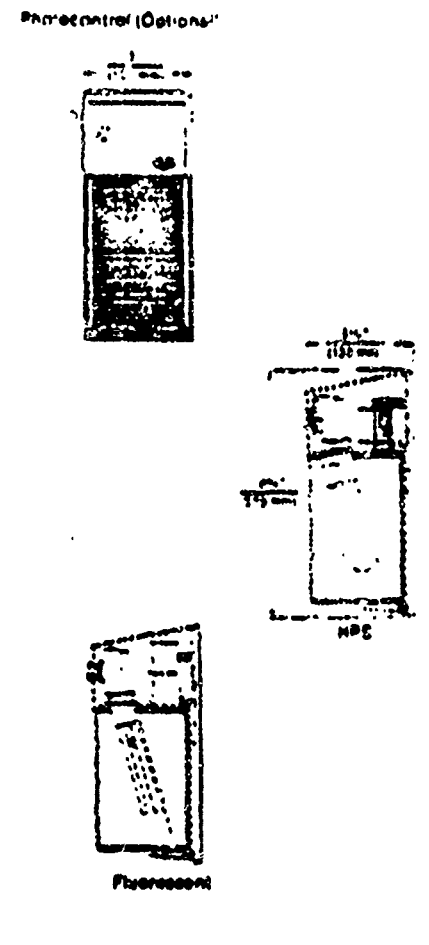
Catalog Number	Description	Weight (lbs.)	Weight (kgs)
HRG-83	Side Mounting Bracket Consist Mounting Slip with four ½" Bolts Plus one Three Gage Mounting Ass Has a Brace Length of Inch	2	1

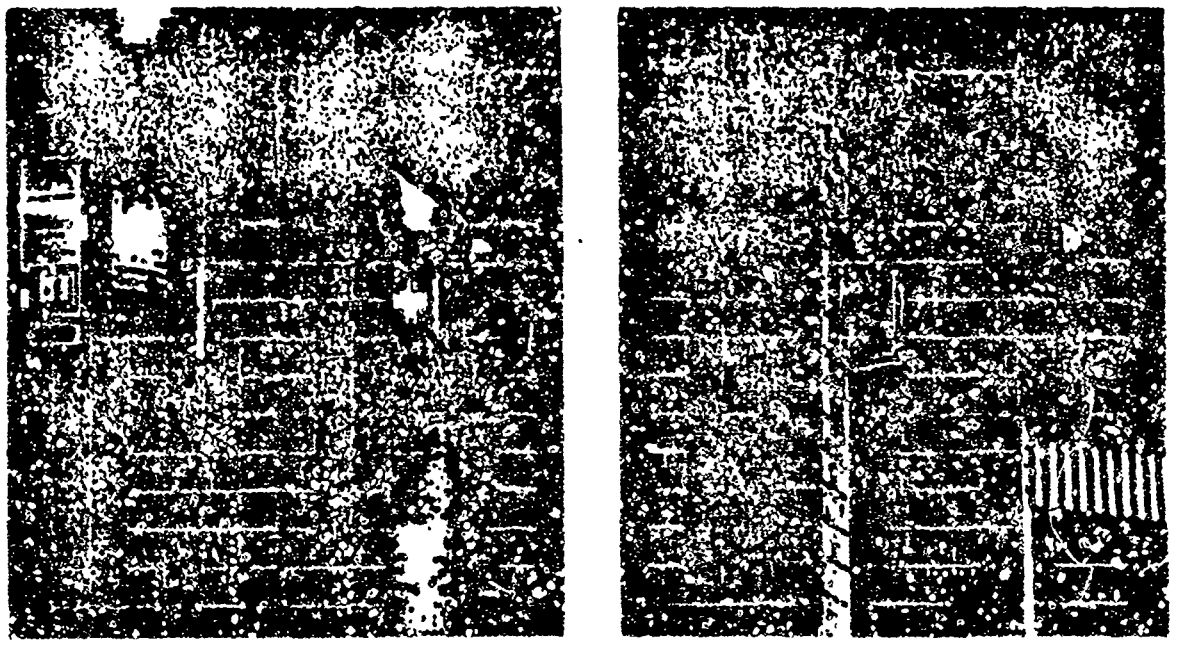
Operating Characteristics

Catalog Number	Input Watts*	Input Volts	Input Amps Starting	Input Amps Operating	Power Factor
HRG-361	88	120	1.83	1.18	0.42
HRG-364-4	34	120	N/A	0.70	0.46
HRG-367	62	120	0.10	1.00	0.43

*Input Watts = Input Volts x Operating Amps x Power Factor

Dimensions



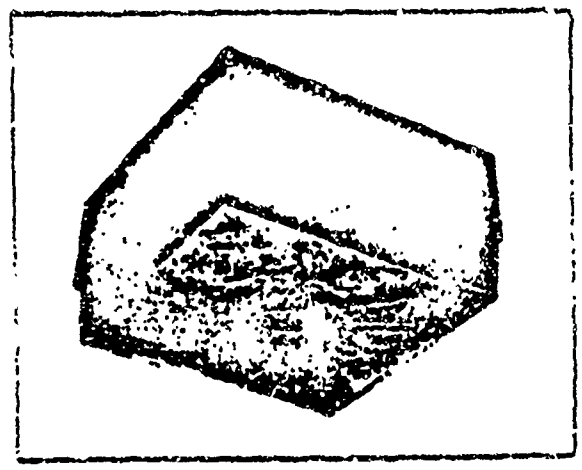


PACE 3-286

LUMASQUARE® I

NRG®-400 SERIES

- Compact, Energy-Efficient Luminaire
- Aesthetic Appearance
- Safety, Security, Architectural Lighting



Hubbell's Lumasquare I luminaire is a compact canopy ceiling mount fixture designed for new construction or retrofitting at 8-12 foot mounting heights. Available in 50w HPS, 26w fluorescent or incandescent. Lumasquare I is ideal for indoor or outdoor applications such as lobbies, stairwells, hallways, corridors, walkways and underpasses.

Housing — One-piece injection molded opaque polycarbonate. Permanent color with textured finish.

Refractor — unique prismatic polycarbonate provides low brightness and uniform distribution.

Reflector — HPS, one-piece hydroformed aluminum with ANODAL® finish for optimum performance. Reflector eliminates glare by shielding the arc tube from normal viewing angles. Fluorescent and incandescent: aluminum with white LEKTROCOTE® finish.

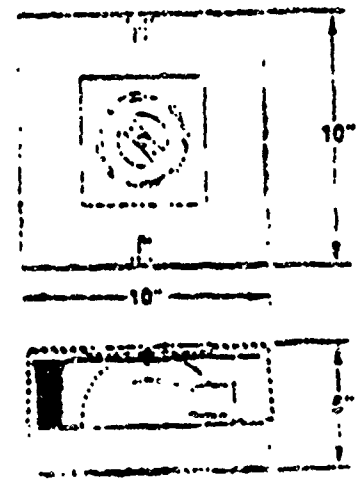
Lamp — HPS: clear 50w medium base lamp is furnished. Fluorescent: two twin tube lamps are furnished. Incandescent: requires two T-10, 40w (maximum) lamps (not included).

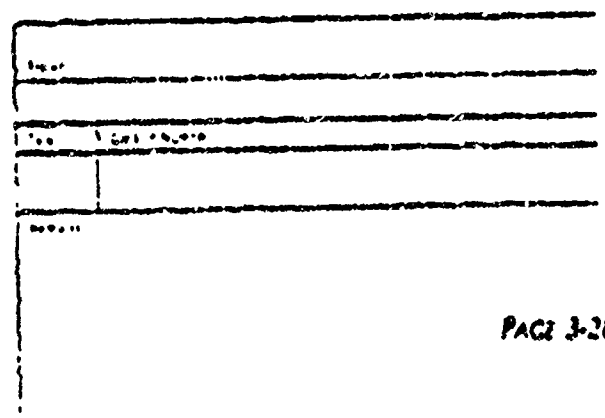
Ballast — HPS: 120 volt NPF or HPF reactor, or 277 volt HPF reactor/autotransformer combination -40°F starting 60 Hz. Fluorescent: two 120 volt, or two 277 volt preheat NPF reactor 60 Hz (50 Hz, available consult factory).

Performance — IES Type V short cutoff distribution.

Additional Features — concealed latching tamper-resistant set screws available. Quick and easy to install two point mounting. UL 1570, 1571 and 1572 also suitable for damp locations.

DIMENSIONS





ORDERING INFORMATION

Catalog Number	Watts	Voltage	Ballast	Weight lbs	Weight kgs
HIGH PRESSURE SODIUM					
NRG-401	50	120	Isolated	7	3.2
FLUORESCENT					
NRG-406-2	26	120	Isolated	5	2.3
INCANDESCENT					
NRG-460	60 (max.)	120	—	5	2.3

OPTIONS The following factory applied options are available. Order with the fixture by adding the appropriate suffix.

Suffix	Description
–277	277 volt operation for HPS or fluorescent
–HP	High power factor ballast for HPS

ACCESSORIES

Field installation with NRG-400 Series. Order separately.

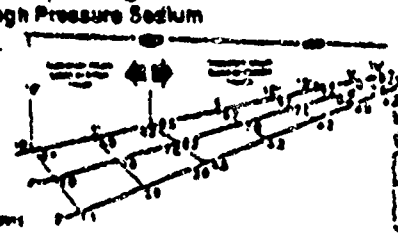
Catalog Number	Description	Weight lbs	Weight kgs
3-318-3	4" cast aluminum round junction box for surface conduit mounting with two mounting legs, four ½" tapped holes, and three plugs	½	.3
NRG-4-TR	"TORX® Lamber proof (T-15) wrench and screws	neg	.04

*TORX is a registered trademark of Textron, Inc.

Footcandle Array Diagram

NRG-401, 50 Watt High Pressure Sodium

Footcandle Array Based On:
- 18' Mounting Height
- 1.8 Spacing Criterion
- No Reflectances



Mounting Height Conversion Table
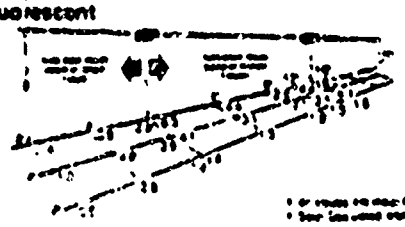
Mounting Height	Factor
4	1.00
6	1.00
8	1.00

* All values are zero Footcandles
* Area Enclosed with dashed line is not shown

Footcandle Array Diagram

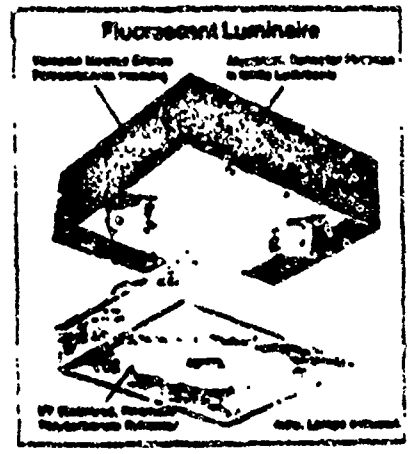
NRG-406-2, 26 Watt Fluorescent

Footcandle Array Based On:
- 8' Mounting Height
- no Reflectances



* All values are zero Footcandles
* Area Enclosed with dashed line is not shown





Suggested Specification

Luminaire shall be Hubbell Lighting Division Luminaire 1 Series, catalog number NRG _____ for use with a _____ watt _____ lamp.

MECHANICAL

The housing shall be one-piece injection molded marine polycarbonate with a textured finish. The reflector material shall be one-piece, injection molded, aluminum stainless steel construction. The optical plate shall match reflector and be injection molded stainless steel prismatic lens which snaps into reflector to housing. The HPS reflector shall be one-piece injection molded aluminum with an Anodized finish. The fluorescent and incandescent reflector shall be one-piece aluminum finished in white. Luminaire shall weigh approximately. The HPS lamp shall be recessed into the reflector to ensure the arc tube of the lamp from view. Luminaire shall be furnished with a clear HPS medium base lamp or 42 W, 2-pin base triple fluorescent lamps. Luminaire shall be Cat. 1570 or 1572 same accessories.

ELECTRICAL

The HPS ballast shall be high power high reactance type suitable for 120V starting. 60 Hz. The luminaire ballast shall be rated for 50% duty cycle.

Luminaire shall operate on 95 to 130 V input.

HUBBELL Lighting

Hubbell Lighting Division, 2000 Electronics Lane, Christiansburg, Virginia 24073 (703) 382-6116 • Fax: (703) 382-6136 • Telex: 80-7015
Hubbell Canada, Inc., 870 Brock Road S., Box 830, Pickering, Ontario, L1V 2R3 (416) 839-1138 • Fax: (416) 839-1108 • Telex: 06-986318
Harvey Hubbell, Ltd., Parsec Close, Wisbech Rd. Ind. Estate, Kings Lynn, Norfolk, England PE30 5PB • Telex: 81681 • Fax: 0553-691226

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This section contains the Project Development Brochures and the DD 1391 Forms for Project II. Lighting Controls at Airfield. Following the DD 1391 Forms is a project summary table, the life cycle cost analysis for the project, and the calculations and cost estimates for each building included in the report. Please note the total cost for the project of $60,078. The project does not meet the $300,000 cut off for ECIP funding. However, the project has a very good SIR of 5.21 and a simple payback of 2.29 years. The project should be an excellent candidate for FEMP funding and was therefore not grouped in with a larger project with poorer economic results. Below is a detailed index of the information included in this section.

PDBs 4-2
DD 1391 Forms 4-18
Table 4.1: Project Summary - Lighting Controls at Airfield 26
LCCA for Total Project 4-27

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facility

LIGHTING CONTROLS AT CAMPBELL army AIRFIELD

Fort Campbell, Kentucky

project coordinator for using service

Arlin Wright

functional requirements summary, PDB-1 | 4-2

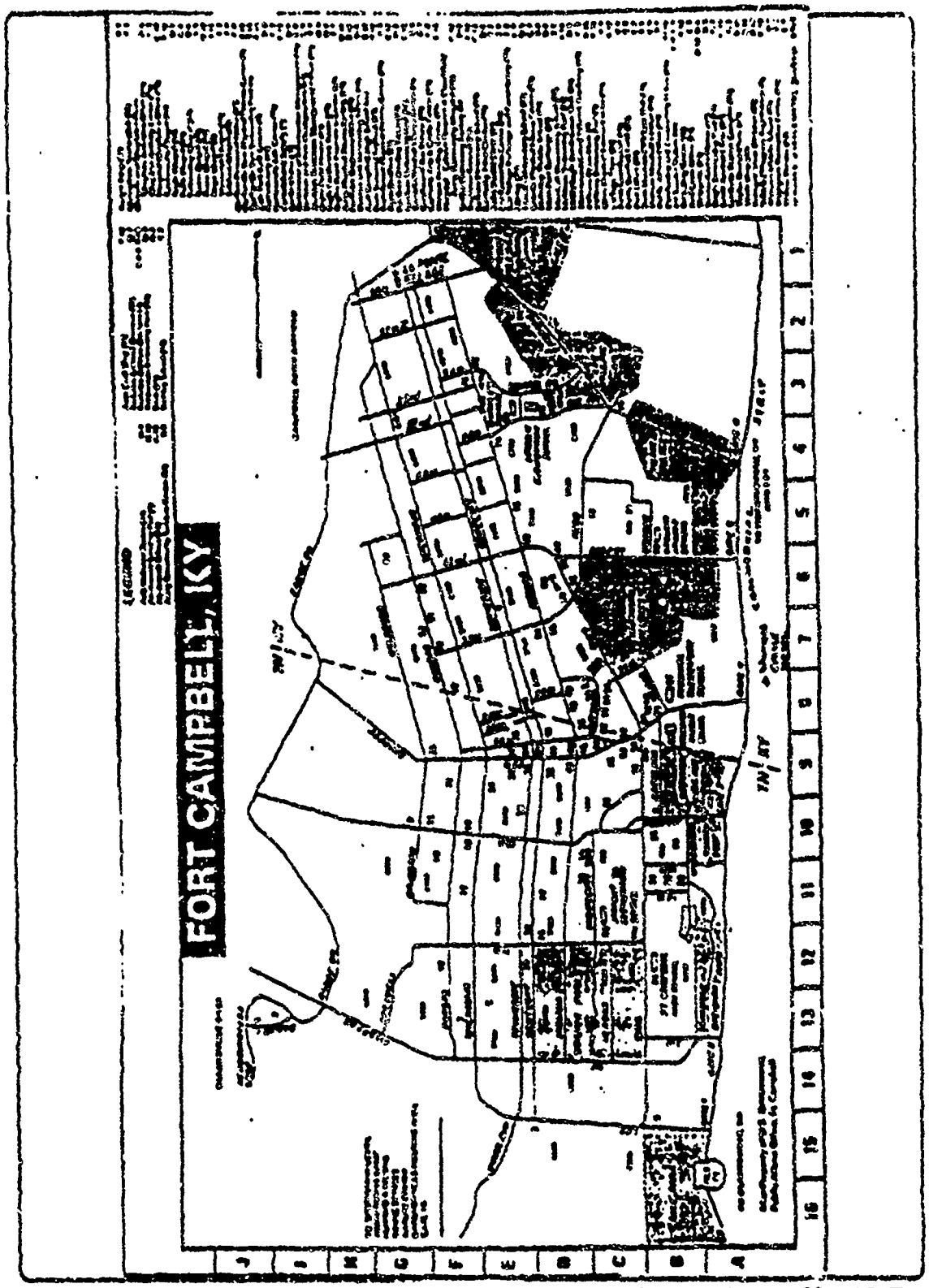
OBJECTIVE:

The objective of t is project is to install daylight sensing on/off photocell controls in hangers at Campbell Army Airfield. The installation of these controls will reduce energy consumption and life cycle operating costs for the buildings at the Airfield in accordance with the Army Energy Resources Management Plan (ERMP) and Executive Order 12759.

functional requirements summary, PDB-1 4-3

DA FORM 5020-2-R, Feb 82

TM 5-330-3 A-9



facilities requirements sketch, PDB- ½ | 4-4

DA FORM 5022-R, Feb 82

TM 5-808-3 A-21

APPENDIX C
DOCUMENTATION CHECKLIST

A. SPECIAL CONSIDERATIONS

	ITEM	REQUIRED OR NOT REQUIRED	BY WHOM	COMMENT ATTACHED	DOCUMENT ATTACHED
A-1	Cost estimate for each primary and supporting facility	R	E		
A-2	Telecommunications system coordination with USAEC and authorization for operation	NR			
A-3	Coordination with state and local governmental requirements (blind vendors, medical facilities, construction and operating permits, clearinghouse coordination, etc.)	R	A		
A-4	Assignment of surplus	NR			
A-5	Economic analysis of alternatives	R	D		
A-6	Approval for new starts	NR			
A-7	International balance of payments (IBOP) coordination with U.S. European command and NATO—overseas cost estimates and comparisons (include rate of exchange used in estimates)	NR			
A-8	Impact on historic places—on site survey by authorized archeologist and coordination with state historic preservation officer and agency council on historic preservation	NR			
A-9	Exceptions to established criteria	NR			
A-10	Coordination with various staff agencies (Physical Security, Classified Material Security, etc.)	R			
A-11	Phasing/deferral of related or support projects (to prevent can be coordinated)	R			
A-12	Required completion date	R			
	Other Special Considerations (Item and number items)				

1. See Appendix A

REQUIRED OR NOT REQUIRED = Mark required or as information is to be furnished. Enter "R" if item is required and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED = Significant information summarized or explained and attached.

DOCUMENT ATTACHED = Significant information is in or on coming document which is attached.

* BY WHOM (Check and insert appropriate letter)

A = DPAE
B = User/Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

documentation checklist

4-6

B. SITE DEVELOPMENT

ITEM		Preparation Responsibility	Is Site Documentation Required?	Documentation Available	Documentation Attached
B-1	Consultation with the District Office to determine site analysis floor plan factors	NR			
B-2	Preparation, submission, and/or approval of the				
(A)	General Site Plan	NR			
(B)	Annotated General Site Plan	NR			
(C)	Sketch Site Plan	NR			
(D)	Facilities Requirements Sketch	R			
B-3	Preparation of				
(A)	Site Survey	NR			
(B)	Subsoil Information	NR			
B-4	Approval by Department of Defense Explosives Safety Board (DDESB) for Safety Site Plan	NR			
	Other Site Development Considerations (List and number items):				
	1. See Project Development Brochure, PDB-1/2				

REQUIRED OR NOT REQUIRED – Mark (check) or fill in information to complete this item. Enter "R" if item is required and is required for this project. Enter "NR" if item is not required or is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter date for information desired.

COMMENT ATTACHED – Significant information summarized or paraphrased and attached.

DOCUMENT ATTACHED – Significant information is on an existing document which is enclosed.

*Key words (Check and insert abbreviation below):

A – OPAS
B – Using Service
C – Construction Service
D – Designer
E – Other (Check Comments Attached and explain)

documentation checklist

4-7

DA FORM 5023-B-R, Feb 62

C. ARCHITECTURAL & STRUCTURAL

ITEM		Required or Not Required	To Be Determined	Comments Attached	Documents Attached
C-1	Reconciliation with Host Mission programs and requirements	NR			
C-2	Evaluation of existing facilities including degree of utilization	R	D		
C-3	Approval for removal and relocation of existing unsuitable facilities	NR			
C-4	Evaluation of alleged community facilities	NR			
C-5	Storage and maintenance facilities including nuclear weapons	NR			
C-6	Coordination hospital, medical and dental facilities with Surgeon General	NR			
C-7	Coordination of aviation facilities with FAA	NR			
C-8	Coordination air traffic control and navigational aids with USASC	NR			
C-9	Tabulation of types and numbers of aircraft	NR			
C-10	Evaluation of laboratory, research and development, and technical maintenance facilities	NR			
C-11	Coordination of space with Chief of Chaplains	NR			
C-12	Review food service facilities by USATSA	NR			
C-13	Automatic data processing system or equipment approval—call area other ADP and/or communication agency not coordinated with using facilities	NR			
C-14	Coordination postal facilities with U.S. Postal Service Regional Director	NR			
C-15	Laundry and dry cleaning facilities coordination with AAFES/BLI	NR			
C-16	Tenant facilities coordination with installation where sited	NR			
C-17	Facilities for or exposed to explosives, toxic chemicals, or ammunition—review by DDESB (See section 5-6)	NR			
C-18	Analysis of participation	R	D		1
C-19	Consideration of alternatives	R	D		2
C-20	Determination whether occupants will include physically handicapped or disabled persons	NR			
C-21	As-built drawings for alterations or additions	R	C		
C-22	Availability of Standard Design or site adaptable designs	NR			

Other Architectural & Structural (List and number items):

1. See Supplemental Data
   Detailed Project Justification
   Paragraphs 03.

2. See Supplemental Data
   Detailed Project Justification
   Paragraph 04.

*REQUIRED OR NOT REQUIRED – Not relevant or no information to comprehend. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED – Information needed but not furnished on sheets. Enter code for information source.

COMMENT ATTACHED – Significant information summarized or published and attached.

DOCUMENT ATTACHED – Significant information is in an existing document which [illegible]

*BY WHOM (Check one most appropriate letter)

A – DPAE
B – Using Service
C – Construction Service
D – Designer
E – Other (Check Comments Attached and explain)

documentation checklist

C-8

DA FORM 5023-C-R, Feb 62

TM 5-800-3 C-9

D. MECHANICAL, ELECTRICAL & UTILITY SYSTEMS

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
D-1	Fuel configurations and cost comparison analysis	R	D		
D-2	Energy requirements approval (EHA):	R	D		1
D-3	Conformance with DOD Energy Regulation requirements	R	D		
D-4	Evaluation of existing and/or proposed utility systems	R	D		
	Other Mechanical and Utility Systems (List one number items)				
	1. See Special Requirements, Paragraph 3 (SRF-3)				

REQUIRED OR NOT REQUIRED = Not relevant or no information to comment on/use. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED = Significant information summarized or explained and attached.

DOCUMENT ATTACHED = Significant information is in an existing document which is attached.

*SET WHOM (Check and insert appropriate letter)

A = DA&E
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

documentation checklist

D-9

DA FORM 5023-D-R, Feb 82

E. ENVIRONMENTAL CONSIDERATIONS

ITEM		Requirements (See Instructions)	Date Determined	Comments Attached	Documents Attached
E-1	Environmental impact assessment	R	D		1
E-2	EA conclusions require Environmental Impact Statement	NR			
E-3	Determination of health, environmental or related hazards. Assistance to determine existence of any health, environmental or related hazard may be requested from Aberdeen Proving Ground MD (HSHB-ME), the Office of the Surgeon General Attn: DASG-HCL (Army Environmental Hygiene Agency)	NR			
E-4	Air/water pollution permit; coordination with agencies and compliance with standards at Federal, state and local level	NR			
E-5	Corrective measures associated with Environmental Impact Statements or environmental assessment and evaluate	NR			
	Other environmental considerations that may number items)				

1. See Supplemental Data
Detailed Project Justification
Paragraph 29.

REQUIRED OR NOT REQUIRED = Are requests or information to complete. Enter "R" if item is required and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter date for information source.

COMMENT ATTACHED = Significant information summarized or explained and attached.

DOCUMENT ATTACHED = Significant information is in an existing document which is attached.

* By MACOM. Check one or more appropriate items)

A = DPAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

documentation checklist

4-10

DA FORM 5023-E-R, Feb 82

APPENDIX D
TECHNICAL DATA CHECKLIST

A. SPECIAL CONSIDERATIONS

ITEM					
A-1	Portion of this requirement to procure / recondition existing items to meet unique characteristics and applicable area coverages	NR			
A-2	Construction/existing equipment	R	R		
A-3	Furniture support equipment (mechanical, electrical, structural) and provisions for built-in	NR			
A-4	Requirement for alteration and justification	NR			
A-5	Other equipment and furniture (OE/BA CPA) and costs	NR			
A-6	Special studies and tests (hazards analysis, compatibility, testing, new technology testing, etc.)	NR			
A-7	Type of contract (procurement, temporary contracts)	NR			
A-8	Government furnished equipment (quantities, procurement lead time available and special handling and storage requirements. Equipment used for procurement	NR			
	Other special considerations (use numbers here)				

REQUIRED OR NOT REQUIRED - Not relevant or no information to be furnished. Enter "R" if item is required and is required for this project. Enter "NR" if item is relevant and is not required for this project.

TO BE DETERMINED - Information needed but not currently available. Enter code for appropriate agency.

COMMENT ATTACHED - Significant information summarized or discussed and attached.

DOCUMENT ATTACHED - Significant information is in an existing document which is attached.

"X" WHERE (Check one or more appropriate items)

A - A&E

E - Using Service

C - Construction Service

D - Designer

L - Other (Check Comments Attached and Explain)

technical data checklist

A-12

DA FORM 5024-A-R, Feb 82

B. SITE DEVELOPMENT

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
B-1	Construction restrictions or guidelines pertaining to:				
(A)	site access and preferred construction routes	R	A		
(B)	Airfield clearance, explosive storage, nesting areas, safety, etc.	R	A		
(C)	Facilities and/or functions on adjoining areas (structures, materials, impact)	R	A		
B-2	Real estate actions (acquisition, disposal, lease, right-of-way)	NR			
B-3	Demolition/relocation required (data)				
(A)	Special considerations due to explosives radioactivity chemical contamination, asbestos smoke and toxic gases	NR			
(B)	Restrictions on disposal of demolished/relocated material including hazardous waste	NR			
B-4	Pavement types and requirements (including traffic surveys and MTMC coordination)	NR			
B-5	Landscape considerations				
(A)	Protection of existing vegetation	R	A		
(B)	Stockpile topsoil	NR			
	Other Site Development (List and number items)				

REQUIRED OR NOT REQUIRED – Not required or no information to confirm mandate. Enter "R" if item is required and is required for this project. Enter "NR" if item is not required and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter date for information to be rec'd.

COMMENT ATTACHED – Significant information summarized or explained on attached.

DOCUMENT ATTACHED – Significant information as in or as the following document which is attached.

*BY WHOM (Check and insert additional agency)

A = DPAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

technical data checklist

4-13

DA FORM 5024-5-R, Feb 82

C. ARCHITECTURAL & STRUCTURAL

	ITEM	Required or Not Required	To Be Determined	Comment Attached	Document Attached
C-1	Vibration-producing equipment requiring isolation	R	D		
C-2	Seismic zone and other design load criteria (typhoon, hurricane, earthquake loads, high or low temperature)	NR			
C-3	Protective shelter evaluation and resistant design criteria (conventional/nuclear blast and radiation, chemical/biological)	NR			
C-4	Unusual foundation requirements (pier, pile, caisson, deep foundations, mat, special treatment, permafrost areas, soil bearing)	NR			
C-5	Designation and strength of crane to be accommodated	NR			
C-6	Requirements and data for special design purposes	NR			
C-7	Unusual floor and roof loads (piers, equipment)	NR			
C-8	Security features (arms room, vaults (interior secure areas))	NR			
	Other Architectural & Structural (List and number items)				

REQUIRED OR NOT REQUIRED – Not necessary to enter information to comply with requirements. Enter "R" if item is required and is required for this project. Enter "NR" if item is not required and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter date for information to be received.

COMMENT ATTACHED – Significant information not summarized or required and provided.

DOCUMENT ATTACHED – Significant information is in an existing document not specifically provided.

*BY WHOM (Check and insert coordinating office)

A = GFAE
B = Using Service
C = Communication Service
D = Designer
E = Other (Check Each Item And Attach Name and Address)

technical data checklist

4-14

DA FORM 5024-C-R, Feb 82

TM 5-807-3 D-9

D. MECHANICAL, ELECTRICAL & UTILITY SYSTEMS

"[A"				
D-1	Special mechanical requirements or considerations (vibration, dust, radio etc.)	NR			
D-2	Special pest proof materials and pest proofing techniques	NR			
D-3	Maintenance considerations (accessibility of equipment, components and parts, and testing equipment)	R	C		
D-4	Plumbing—availability, general system type and characteristics (proposed and/or existing; incorporated or not)	NR	D		
D-5	Heating—availability, general system type and characteristics (proposed and/or existing)	NR			
D-6	Ventilating or conditioning/refrigeration—availability, general system type and characteristics (proposed and/or existing)	R	D		
D-7	Electrical—availability, general system type and characteristics (incl. natural lighting, communication, etc. (proposed and/or existing)	NR			
D-8	Water supply/waste treatment—availability, general system type and characteristics (proposed and/or existing)	NR			
D-9	Energy requirements (fuel consumption, sources and kinds, types of fuel, etc.)	R	D		
D-10	Solar energy evaluation	NR			
	Other Mechanical & Utility Systems (List and number items)				

REQUIRED OR NOT REQUIRED = Not necessary at the preliminary design stage for the communities. Enter "NR" if item is necessary and is required for this project. Enter "NR" if item is necessary and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED = Brief text information summarized or summarized and planned.

DOCUMENT ATTACHED = Enter report information of the type of document which is provided.

* BY WHOM (Check one or more appropriate origin)

A = DPAE
B = User Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

technical data checklist

D-15

DA FORM 5C24-D-R, Feb 82

E. ENVIRONMENTAL CONSIDERATIONS

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
E-1	Waste water treatment, air quality, and solid waste disposal or reuse	NR			
	Other Environmental Considerations (Use one number for each item)				

REQUIRED OR NOT REQUIRED – Not relevant or no information is commercially available. Enter "R" if item is required and is required for this project. Enter "NR" if item is necessary and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter code for responsible source.

COMMENT ATTACHED – Significant information summarized or explained on this checklist.

DOCUMENT ATTACHED – Significant information is in an existing document which is attached.

*BY WHOM (Enter one most appropriate letter)

A – DPAE
B – User Service
C – Construction Service
D – Designer
E – Other (Specify Comments Attached and Explain)

technical data checklist

4-16

DA FORM 5024-E-R, Feb 82

F. FIRE PROTECTION

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
6.1	Special fire protection systems or features (detection and suppression equipment, halons, etc.)	ND			
	Other Fire Protection Considerations (e.g. sprinkler density, number risers, etc.)				

REQUIRED OR NOT REQUIRED – Not necessary or no information is available. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter code for anticipated source.

COMMENT ATTACHED – Significant information summarizing or explaining data.

DOCUMENT ATTACHED – Significant information in an existing document which is unique.

SOURCE (Check one or more appropriate letter)

A – Owner
B – Using Service
C – Construction Service
D – Designer
E – Other (Check Comments Attached and explain)

technical data checklist

4-17

DA FORM 5024-F-R, Feb 82

1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 Septembe

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Fort Campbell, Kentucky	Lighting Controls at Airfield

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
		ECIP #2	$80.08

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	CO ($0
Primary Facility				
Daylight Sensing On/Off Protocel Controls	Lot	1	51 77	
Subtotal				
Contingency (10%)				
Total Contract Cost				
Supervision, Inspection and Overhead (5 5%)				
Total Request				

10. DESCRIPTION OF PROPOSED CONSTRUCTION

The existing interior lighting is a combination of mercury vapor, metal halide, and high pressure so fixtures. The proposed project will install daylight sensing on/off photocell controls on these fixtures. implementation of this project will save 669,466 MJ/yr of electrical energy. The first year dollar savir $26,209, the Savings to Investment Ratio (SIR) is 5.21, and the simple payback is 2.29 years.

11. REQUIREMENT

Project: The proposed project installs daylight sensing on/off photocell controls on the fixtures in the hig areas of buildings 7152, 7154, 7156, 7206, 7208, 7210, 7214, 7216, 7243, 7245, 7249, 7262, 7264, 726 7272.
Requirement: The project is required to reduce the energy consumption of lighting and to comply with the Energy Resources Management Plan (ERMP) and Executive Order 12759. The proposed project will r annual energy consumption by 669,466 MJ/yr and annual energy cost by $26,209.

Current Situation: The existing fixtures in the above listed buildings have no controls to allow energy s other than manual switches. The lights are not being switched off during peak daylight hours.

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 Septembe

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

Impact if not provided: If the proposed project is not funded, a reduction of 669,466 MJ/yr cannot be achie and excessive amounts of energy will continue to be used. There will be no contribution to energy redu goals established for United States Army facilities by Army Headquarters.

Colonel, USA
Commanding

ESTIMATED CONSTRUCTION START	September 1995	INI
ESTIMATED MIDPOINT OF CONSTRUCTION	April 1996	INI
ESTIMATED CONSTRUCTION COMPLETION	November 1996	IN

DETAILED JUSTIFICATIONS

D1. GENERAL

The proposed project encompasses the installation of daylight sensing on/off photocell controls in the areas of buildings 7152, 7154, 7156, 7206, 7208, 7210, 7214, 7218, 7243, 7245, 7248, 7262, 7264, 7268 7272. The project will decrease the energy consumption of the lighting systems by taking advantage o available daylight while maintaining required light levels.

D2. ACCOMMODATIONS NOW IN USE:

The existing lighting systems are comprised of high intensity discharge fixtures with manual on/off cor

D3. ANALYSIS OF DEFICIENCY:

Currently, the above hangars are using manual switches to control the lighting systems in high bay areas purpose of this project is to install automatic daylight sensing photocell controllers which will take adva of free daylighting available. The current deficiency results in large amounts of energy usage during pe when artificial lighting is not necessary to maintain adequate light levels.

DD FORM 1391
1 DEC 78

PREVIOUS EDITIONS MAY BE USED INTERNALLY
UNTIL EXHAUSTED

FOR OFFICIAL USE ONLY
(WHEN DATA IS ENTERED)

1 COMPONENT	FY 19 84 MILITARY CONSTRUCTION PROJECT DATA	3 DATE
ARMY		23 September 9

2. INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	
4 PROJECT TITLE	5 PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

D4. CONSIDERATION OF ALTERNATIVES:

The only alternatives to the proposed project are to install more sophisticated automatic control syster These systems would cost significantly more while providing minimal additional energy savings. The proj would have a lower SIR.

D5. CRITERIA FOR PROPOSED PROJECT:

The proposed project will conform with all applicable federal and United States Army Regulations.

D6. PROGRAM FOR RELATED EQUIPMENT:

No equipment funded from appropriations other than MCA are required.

D7. DISPOSAL OF PRESENT ASSETS:

There is no material to be disposed.

D8. SURVIVAL FACILITIES:

The proposed project is not suitable for inclusion of protective shelters.

D9. SUMMARY OF ENVIRONMENTAL CONSEQUENCES:

The proposed project has been analyzed and will not adversely impact the environment. Energy savi resulting from the project will conserve natural resources.

D10. EVALUATION OF FLOOD HAZARDS AND ENCROACHMENT ON WETLANDS:

It has been determined that these facilities are not located in a flood plain and they do not encroach wetlands.

D11. ECONOMIC JUSTIFICATION:

The proposed project qualifies under ECIP Guidelines in AR-415-15. SIR for the project is 5.21 with a sin payback of 2.29 years.
See Economic Analysis, SRP-1

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 9

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

D12. UTILITY AND COMMUNICATION SUPPORT.

A. No related utility support projects are programmed. Adequate utilities are available to support project.

B. No telecommunication support is required.

D13. PROTECTION OF HISTORIC PLACES AND ARCHEOLOGICAL SITES:

The project involves the installation of controls in existing buildings. Review procedures have bi implemented for this project in accordance with 36 CFT 800. The review has established that there will be affect.

D14. PROJECT DEVELOPMENT BROCHURE (PART 1):

A Project Development Brochure was prepared on 23 September 94 and is attached as a part of programming documentation.

D15. ENERGY REQUIREMENTS:

The proposed project will reduce present energy consumption by 669,466 MJ/yr at the cost savings of $26. per year. See Energy Requirements Appraisal (ERA) in Special Requirements, Paragraph 3 (SRP-3).

D16. PROVISION FOR THE HANDICAPPED:

No provisions for the handicapped will be made since the scope of the project is in no way applicabl designing for the handicapped.

D17. REAL PROPERTY MAINTENANCE ACTIVITY (RPVA) ANALYSIS:

A. Physical impact: No new structures will be added. Controls will be connected to existing light fixtu

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

B. Operations and Maintenance (O&M) impact:

YEAR	O&M NET CHANGE ($000)
1994	0
1995	0
1996	0

C. Backlog of Maintenance and Repair (BMAR) impact:

There will be no net change in the number of fixtures or in fixture life expectancy. There will be no effe on BMAR.

D18. COMMERCIAL ACTIVITIES:

The proposed project is not a "New Start Expansion" as defined by DA Circular 235-1. The project has bee reviewed in light of the requirements of commercial and industrial facilities. It has been determined th whereas the project does not affect commercial facilities, the requirements of DA Circular 235-1 does not appl

1 COMPONENT		7 DATE
ARMY	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	23 September 94

3 INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	

4 PROJECT TITLE	5 PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

Life Cycle Cost Analysis
Project Title: Lighting Controls at A field
Fiscal Year: 1994
Analysis Date 09/23/94
Economic Life: Fifteen (*5) Years

1 INVESTMENT

A	CONSTRUCTION COST	54 618
B	SIOH	2 731
C	DESIGN COST	2 731
D.	ENERGY CREDIT CALC	-0-
E.	SALVAGE VALUE	-0-
F	TOTAL INVESTMENT	$60,078

2 ENERGY SAVINGS
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST & DISCOUNTED SAVINGS

FUEL	COST $/MBTU (1)	SAVINGS MBTU/YR(2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	6.18	634	3,921	12.43	48,738
B. DIST					
C. RESID					
D NG					
E DEMAND			22 288	11 85	264,113
F. TOTAL		634	26,209		312 851

3. NON-ENERGY SAVINGS

A ANNUAL RECURRING		$0
(1)DISCOUNT FACTOR	11.85	
(2)DISCOUNTED SAVINGS		$0
B NON-RECURRING SAVINGS		

ITEM	SAVINGS (+) COST(-)(1)	YEAR OF OCCURRENCE	DISCOUNT (2) FACTOR	DISCOUNTED SAVINGS(+) COST (-)(4)
a. Replace Interior				
b. Replace Exterior				
c.				
d. Total				

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+)/COST(-)

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1 DEC 78

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FOR OFFICIAL USE ONLY
(WHEN DATA IS ENTERED)

1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 September 94

3. INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4. PROJECT TITLE	5. PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

SPECIAL REQUIREMENTS PARAGRAPH 1 (SRP-1) (continued)

4	FIRST YEAR DOLLAR SAVINGS	$ 28.20
5	SIMPLE PAYBACK PERIOD	2.29 Year
6	TOTAL NET DISCOUNTED SAVINGS	$312.85
7	DISCOUNTED SAVINGS RATIO	5.2

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 September 9

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
LIGHTING CONTROLS AT AIRFIELD	ECIP #2

SPECIAL REQUIREMENTS PARAGRAPH 3 (SRP-3):

Energy Requirements Appraisal (ERA)

1. Project Description: Install daylight sensing photocell controls on the existing fixtures in the ba areas of the airfield hangars.

2. Estimated Energy Consumption The lighting systems are currently controlled by manu switches The existing systems consume 4,973 174 MJ/yr of energy. Installing the daylig sensing controls will result in 669,466 MJ/yr of electrical energy savings, a thirteen (13' reduction in current energy consumption.

3. Energy Sources: No new energy sources are required for the proposed project. The use solar energy for this project is impractical.

4. Energy Use Impacts: The proposed project will substantially reduce the consumption electricity for lighting. The burden on the existing base distribution system will be lessened.

5. Energy Conservation The proposed project will reduce annual energy consumption by 669,4 MJ/Yr with annual energy cost savings of $26,209. The project complies with Army Resourc Management Plan (ERMP) and Executive Order 12759.

6. Energy Alternatives: The proposed project represents the greatest possible reduction in ener consumption thirteen percent (13%), while maintaining appropriate light levels. The curre levels do not exceed the leve's recommended by ASHRAE.

7. Energy Effects: The proposed project provides positive environmental effects. It reduces t current energy consumption by thirteen percent (13%), effectively reducing the consumption non-renewable fuel sources. The degrading of environmental standards would not make mc efficient energy sources available

8. Basis of Approval. Total energy requirements and alternative fuel sources have been consider and included in this appraisal or discarded as applicable.

TABLE 4.1
PROJECT SUMMARY: AIRFIELD CONTROLS

ECO NUMBER	CURRENT NUMBER	BASELINE ENERGY (MBTU)	ECO ENERGY (MBTU)	ENERGY SAVINGS (MBTU)	1ST YEAR SAVINGS	INVESTMENT COSTS	ANNUAL RECURRING	SPB (YRS)	SIR	MATERIAL COSTS	LABOR COSTS	ADDITIONAL COSTS*	TOTAL COST ESTIMATE
2	7152	[illegible]	71,273	11,850	$903	$3,429	$0	3.80	2.63	$1,988	$1,524	$979	$3,489
2	7154	[illegible]	71,873	11,850	$903	$3,485	$0	3.86	2.63	$1,988	$1,524	$979	$3,489
2	7156	[illegible]	70,883	12,430	$1,080	$3,429	$0	3.18	2.92	$1,988	$1,524	$979	$3,489
2	7158	[illegible]	[illegible]	20,184	$1,846	$3,178	$0	2.08	3.73	$177	$734	$660	$2,178
2	7208	[illegible]	257,646	36,642	$2,487	$4,548	$0	1.89	6.32	$1,937	$1,483	$1,179	$4,599
2	7210	[illegible]	[illegible]	20,266	$883	$3,548	$0	5.57	2.17	$1,616	$1,889	$841	$3,648
2	7214	[illegible]	688,774	77,888	$2,537	$4,548	$0	1.78	6.88	$1,962	$1,483	$1,179	$4,548
2	7216	[illegible]	688,774	77,888	$2,537	$4,548	$0	1.78	6.88	$1,962	$1,483	$1,179	$4,548
2	7218	[illegible]	363,884	48,874	$1,588	$3,137	$0	1.98	6.04	$1,177	$1,182	$0.8	$3,137
2	7220	[illegible]	182,574	28,480	$903	$4,243	$0	4.68	2.01	$1,708	$1,263	$1,884	$4,243
2	7240	[illegible]	682,584	28,480	$903	$4,243	$0	4.68	2.01	$1,708	$1,263	$1,884	$4,243
2	7242	[illegible]	679,888	87,888	$4,258	$7,548	$0	6.78	6.38	$3,248	$2,352	$1,948	$7,548
2	7244	[illegible]	877,288	88,888	$3,888	$3,838	$0	6.88	12.88	$1,472	$1,373	$888	$3,835
2	7246	[illegible]	344,288	48,888	$2,118	$3,478	$0	1.65	7.27	$1,517	$1,883	$895	$3,475
2	7252	[illegible]	[illegible]	78,787	$4,887	$7,838	$0	2.47	4.82	$1,888	$1,272	$1,872	$7,232
TOTALS		4,672,174	4,192,788	668,488	$36,338	$88,878	$0	2.38	5.31	$33,378	$19,274	$18,488	$88,878

*[illegible]

LIFE CYCLE COST ANALYSIS SUMMARY — STUDY: ECO2AAFT
ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) — LCCID 1.080
INSTALLATION & LOCATION: FORT CAMPBELL REGION NOS. 4 CENSUS: 3
PROJECT NO. & TITLE: ECO2AAFT LIGHTING CONTROLS - AIRFIELD TOTAL
FISCAL YEAR 94 DISCRETE PORTION NAME: LIGHTING
ANALYSIS DATE: 09-14-94 ECONOMIC LIFE 15 YEARS PREPARED BY: J. HOLLENSB

1. INVESTMENT

A. CONSTRUCTION COST	$ 54616.		
B. SIOH	$ 2731.		
C. DESIGN COST	$ 2731.		
D. TOTAL COST (1A+1B+1C)	$ 60078.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	$ 0.		
F. PUBLIC UTILITY COMPANY REBATE	$ 0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)		$	60078.

2. ENERGY SAVINGS (-) / COST (-)
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST $/MBTU(1)	SAVINGS MBTU/YR(2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	$ 6.18	634.	$ 3921.	12.43	$ 48738.
B. DIST	$ .00	0.	$ 0.	13.56	$ 0.
C. RESID	$ .00	0.	$ 0.	13.09	$ 0.
D. NAT G	$ .00	0.	$ 0.	15.86	$ 0.
E. COAL	$ .00	0.	$ 0.	13.61	$ 0.
F. LPG	$ .00	0.	$ 0.	12.64	$ 0.
M. DEMAND SAVINGS			$ 22288	11.85	$ 264113.
N. TOTAL		634.	$ 26209.		$ 312851.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-) — $ 0.
(1) DISCOUNT FACTOR (TABLE A) — 11.85
(2) DISCOUNTED SAVING/COST (3A X 3A1) — $ 0.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4) $ 0.

4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE)) $ 2620+.

5. SIMPLE PAYBACK PERIOD (1G/4) 2.39 YE

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) $ 312851

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 5.21
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 15.09 %

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7152
AREA: HANGAR BAY

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

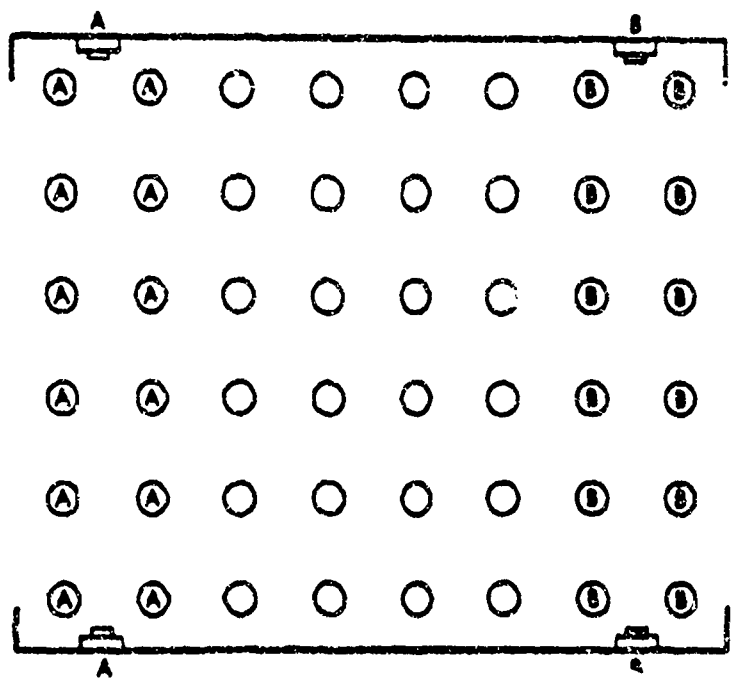
LIGHTING CONTROLLED: 11 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	8	HR/DAY	8
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	22,813 KWH 82,128 MJ	ECO ENERGY CONSUMPTION	10,742 KWH 71,073 MJ
BASELINE DEMAND	$1,560	ECO DEMAND	$1,034

NET ENERGY SAVINGS	11,868 MJ/YR	NET DEMAND SAVINGS	$517 /YR
NET ENERGY SAVINGS	10.43 MBTU/YR	NET DOLLAR SAVINGS	$582 /YR

PHOTOCELL CONTROL LAYOUT
Building 7152



LEGEND	
Symbol	Description
O	Light; Controlled by Manual Switch Only
(A)	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7152 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1611350023	LOW VOLTAGE WIRE #18-4C					10.00	CLF	
Unit values		1.23	15.40	34.00	0.00	0.00		49.40
Totals		12.31	$154	$340	$0	$0		$494
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					3.00	EA	
Unit values		2.00	137.00	55.00	0.00	0.00		192.00
Totals		6.00	$411	$165	$0	$0		$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00	EA	
Unit values		1.00	290.00	27.50	0.00	0.00		317.50
Totals		4.00	$1,160	$110	$0	$0		$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00	EA	
Unit values		0.67	64.00	18.35	0.00	0.00		82.35
Totals		0.67	$64	$18	$0	$0		$82
1611870102	SWITCHING RELAYS					8.00	EA	
Unit values		0.50	11.30	13.75	0.00	0.00		25.05
Totals		4.00	$90	$110	$0	$0		$200
1611950101	1/2" EMT					340.00	LF	
Unit values		0.05	0.38	1.29	0.00	0.00		1.67
Totals		15.98	$129	$438	$0	$0		$568
U16 ELECTRICAL		43	$2,008	$1,182	$0	$0		$3,190

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL		43	$2,008	$1,182	$0	$0	$3,190
SALES TAX		5.00%	$100				
MATL MARKUP		-30.00%	($602)				
LABOR MARKUP		-13.40%		($158)			
EQUIPT MARKUP		0.00%			$0		
SUB MARKUP		0.00%				$0	
TOTAL BEFORE CONTINGENC			$1,506	$1,024	$0	$0	$2,530
CONTINGENCY		10.00%					$253
BOND		2.50%					$63
PROFIT		10.00%					$253
JOB TOTAL							$3,099

Estimate: Bldg. 7152 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	43	$2,008	$1,182	$0	$0	$3,19
TOTAL	43	$2,008	$1,182	$0	$0	$3,19
SALES TAX	5.00%	$100				
MATL MARKUP	-30.00%	($602)				
LABOR MARKUP	-13.40%		($156)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,506	$1,024	$0	$0	$2,53
CONTINGENCY	10.00%					$25
BOND	2.50%					$6
PROFIT	10.00%					$25
JOB TOTAL						$3,09

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7154
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

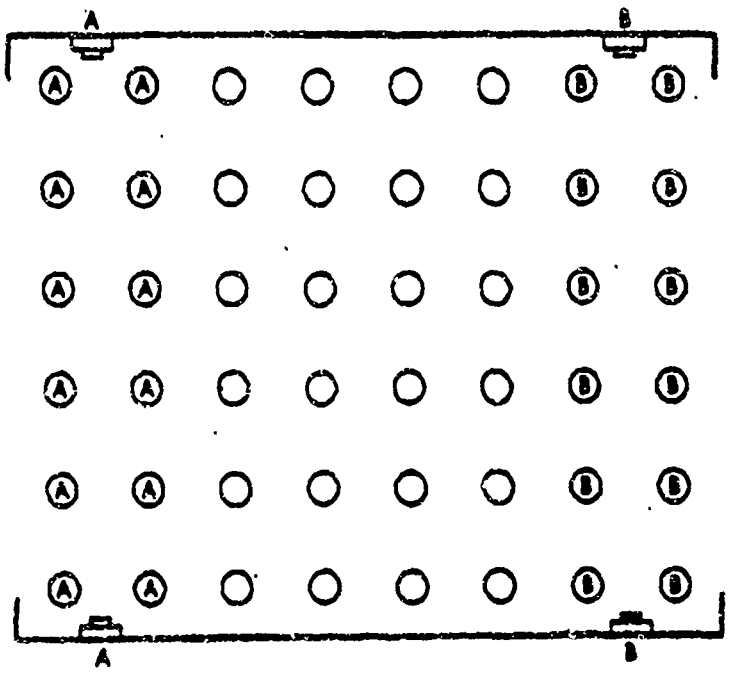
LIGHTING CONTROLLED: 11 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	8	HR/DAY	8
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	22,813 KWH 82,128 MJ	ECO ENERGY CONSUMPTION	19,742 KWH 71,073 MJ
BASELINE DEMAND	$1,550	ECO DEMAND	$1,034

NET ENERGY SAVINGS	11,056 MJ/YR	NET DEMAND SAVINGS	$517 /YR
NET ENERGY SAVINGS	10.48 MBTU/YR	NET DOLLAR SAVINGS	$582 /YR

PHOTOCELL CONTROL LAYOUT
Building 7154



LEGEND	
Symbol	Description
O	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7154 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					10.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.4(
Totals		12.31	$154	$340	$0	$0	$494
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					3.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.0(
Totals		6.00	$411	$165	$0	$0	$57(
1611850101	PHOTO SWITCH 5C-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.5(
Totals		4.00	$1,160	$110	$0	$0	$1,27(
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	6 [illegible]	18.35	0.00	0.00	82.3!
Totals		0.67		$18	$0	$0	$8!
1611870102	SWITCHING RELA.					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.0!
Totals		4.00	$90	$110	$0	$0	$20(
1611950101	1/2" EMT					340.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.6
Totals		15.98	$129	$439	$0	$0	$56!
U16 ELECTRICAL		43	$2,008	$1,182	$0	$0	$3,19!

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	43	$2,008	$1,182	$0	$0	$3,190
SALES TAX	5.00%	$100				
MATL MARKUP	-30.00%	($602)				
LABOR MARKUP	-13.40%		($158)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,506	$1,024	$0	$0	$2,530
CONTINGENCY	10.00%					$253
BOND	2.50%					$63
PROFIT	10.00%					$253
JOB TOTAL						$3,099

Estimate: Bldg. 7154 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	43	$2,008	$1,182	$0	$0	$3,190
TOTAL	43	$2,008	$1,182	$0	$0	$3,190
SALES TAX	5.00%	$100				
MATL MARKUP	-30.00%	($602)				
LABOR MARKUP	-13.40%		($158)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,506	$1,024	$0	$0	$2,530
CONTINGENCY	10.00%					$253
BOND	2.50%					$63
PROFIT	10.00%					$253
JOB TOTAL						$3,099

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

18 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7158
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

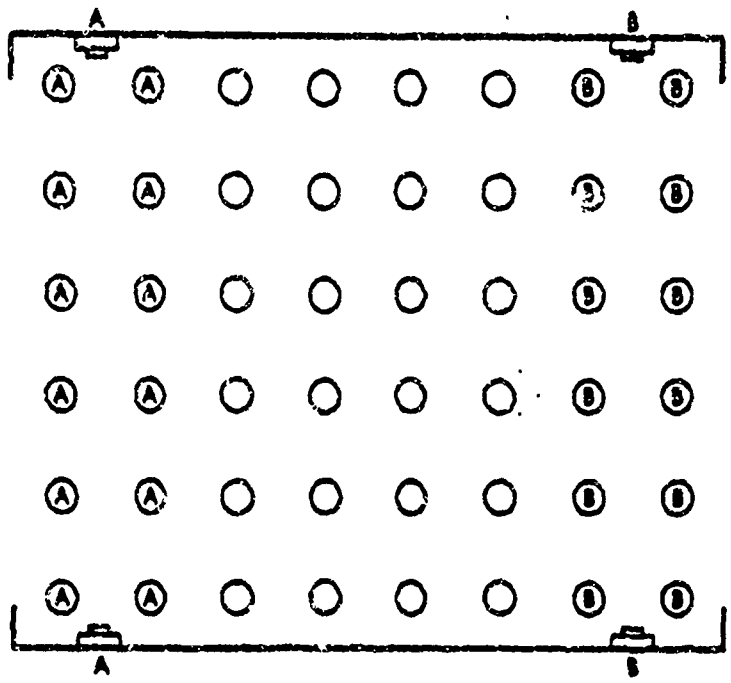
LIGHTING CONTROLLED: 11 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	9	HR/DAY	9
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	6

BASELINE ENERGY CONSUMPTION	25,666 KWH	ECO ENERGY CONSUMPTION	22,210 KWH
	92,394 MJ		79,957 MJ
BASELINE DEMAND	$1,999	ECO DEMAND	$1,834

NET ENERGY SAVINGS	12,438 MJ/YR	NET DEMAND SAVINGS	$617 /YR
NET ENERGY SAVINGS	11.79 MBTU/YR	NET DOLLAR SAVINGS	$599 /YR

PHOTOCELL CONTROL LAYOUT
Building 7156



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7156 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					10.00 CLF	
	Unit values	1.23	15.40	34.00	0.00	0.00	49.40
	Totals	12.31	$154	$340	$0	$0	$494
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					3.00 EA	
	Unit values	2.00	137.00	55.00	0.00	0.00	192.00
	Totals	6.00	$411	$165	$0	$0	$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00 EA	
	Unit values	1.00	290.00	27.50	0.00	0.00	317.50
	Totals	4.00	$1,160	$110	$0	$0	$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
	Unit values	0.67	64.00	18.35	0.00	0.00	82.35
	Totals	0.67	$64	$18	$0	$0	$82
1611870102	SWITCHING RELAY					8.00 EA	
	Unit values	0.50	11.30	13.75	0.00	0.00	25.05
	Totals	4.00	$90	$110	$0	$0	$200
1611950101	1/2" EMT					340.00 LF	
	Unit values	0.05	0.38	1.29	0.00	0.00	1.67
	Totals	15.98	$129	$439	$0	$0	$568
U13 ELECTRICAL		43	$2,008	$1,182	$0	$0	$3,190

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	43	$2,008	$1,182	$0	$0	$3,190
SALES TAX	5.00%	$100				
MATL MARKUP	-30.00%	($602)				
LABOR MARKUP	-13.40%		($158)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,506	$1,024	$0	$0	$2,530
CONTINGENCY	10.00%					$253
BOND	2.50%					$63
PROFIT	10.00%					$252
JOB TOTAL						$3,099

Estimate: Bldg. 7156 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	43	$2,008	$1,182	$0	$0	$3,190
TOTAL	43	$2,008	$1,182	$0	$0	$3,190
SALES TAX	5.00%	$100				
MATL MARKUP	-30.00%	($602)				
LABOR MARKUP	-13.40%		($158)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,506	$1,024	$0	$0	$2,530
CONTINGENCY	10.00%					$253
BOND	2.50%					$63
PROFIT	10.00%					$253
JOB TOTAL						$3,099

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS
19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7208
AREA: HANGAR BAY

ELECTRIC COSTS.
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.73 PER KW

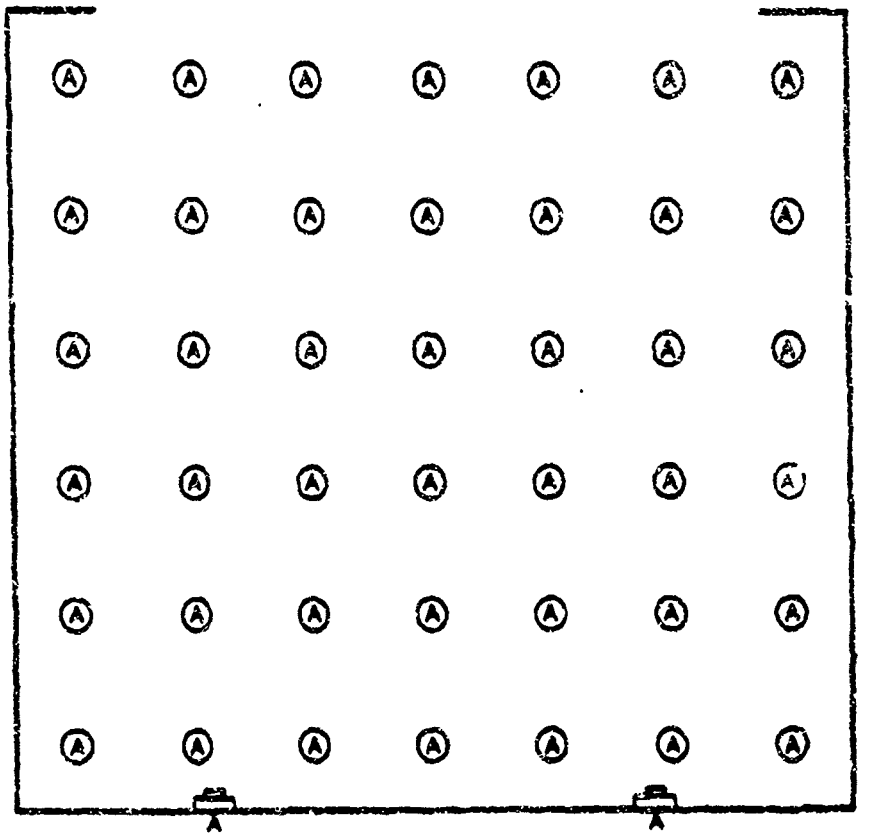
LIGHTING CONTROLLED: 16 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	10	HR/DAY	10
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	*49,584*	*KWH*	*ECO ENERGY CONSUMPTION*	*43,187* *KWH*
	179,836	*MJ*		*155,471* *MJ*
BASELINE DEMAND	*$2,713*		*ECO DEMAND*	*$1,809*

NET ENERGY SAVINGS	24,184 MJ/YR	NET DEMAND SAVINGS	$904 /YR
NET ENERGY SAVINGS	22.92 KBTU/YR	NET DOLLAR SAVINGS	$1,046 /YR

PHOTOCELL CONTROL LAYOUT
Building 7206



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7206 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line # / Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023 LOW VOLTAGE WIRE #18					5.00 CLF	
Unit values	1.23	15.40	34.00	0.00	0.00	49.40
Totals	6.16	$77	$170	$0	$0	$247
1611750101 LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					2.00 EA	
Unit values	2.00	137.00	55.00	0.00	0.00	192.00
Totals	4.00	$274	$110	$0	$0	$384
1611850101 PHOTO SWITCH 50-500 FC ADJUSTABLE					2.00 EA	
Unit values	1.00	290.00	27.50	0.00	0.00	317.50
Totals	2.00	$580	$55	$0	$0	$635
1611870101 LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values	0.67	64.00	18.35	0.00	0.00	82.35
Totals	0.67	$64	$18	$0	$0	$82
1611870102 SWITCHING RELAYS					4.00 EA	
Unit values	0.50	11.30	13.75	0.00	0.00	25.05
Totals	2.00	$45	$55	$0	$0	$100
1611950101 1/2" EMT					340.00 LF	
Unit values	0.05	0.38	1.29	0.00	0.00	1.67
Totals	15.98	$129	$439	$0	$0	$568
U16 ELECTRICAL	31	$1,169	$847	$0	$0	$2,016

Line # Description

	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	31	$1,169	$847	$0	$0	$2,01
SALES TAX	5.00%	$58				
MATL MARKUP	-30.00%	($351)				
LABOR MARKUP	-13.40%		($113)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$877	$734	$0	$0	$1,6:
CONTINGENCY	10.00%					$1(
BOND	2.50%					$4
PROFIT	10.00%					$1(
JOB TOTAL						$1,9'

Estimate: Bldg. 7206 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	3:	$1,169	$847	$0	$0	$2,(
TOTAL	3:	$1,169	$847	$0	$0	$2,(
SALES TAX	5.00%	$58				
MATL MARKUP	-30.00%	($351)				
LABOR MARKUP	-13.40%		($113)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$877	$734	$0	$0	$1,(
CONTINGENCY	10.00%					$:
BOND	2.50%					
PROFIT	10.00%					$:
JOB TOTAL						$1,(

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1984

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7208
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.76 PER KW

LIGHTING CONTROLLED: 44 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

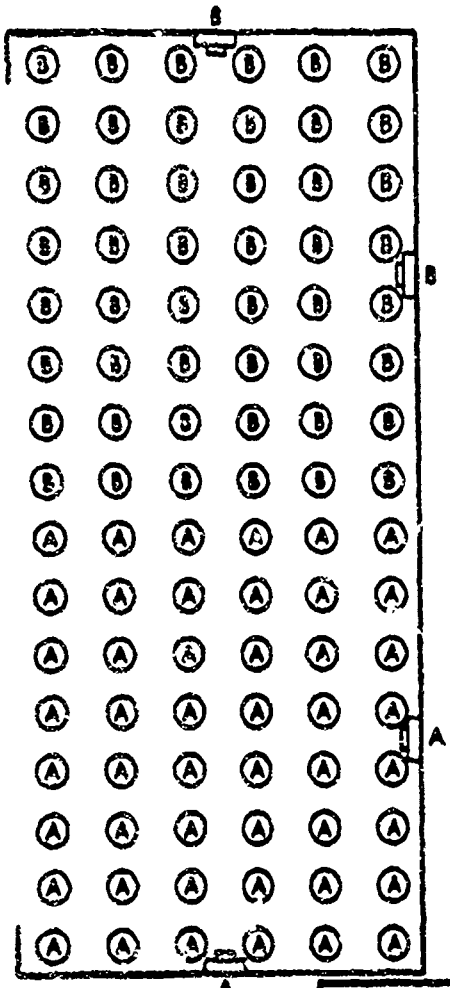
CURRENT USAGE:	
HR/DAY	10
DAY/WEEK	5
WEEKS/YR	52
DEMAND (MO/YR)	12

REVISED USAGE:	
HR/DAY	10
DAY/WEEK	5
WEEKS/YR	45
DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	114,815 KWH	ECO ENERGY CONSUMPTION	99,360 KWH
	413,330 MJ		357,696 MJ
BASELINE DEMAND	84,342	ECO DEMAND	64,782

NET ENERGY SAVINGS	56,842 MJ/YR	NET DEMAND SAVINGS	$2,061 /YR
NET ENERGY SAVINGS	52.74 MBTU/YR	NET DOLLAR SAVINGS	$2,487 /YR

PHOTOCELL CONTROL LAYOUT
Building 7208



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

PAC

Estimate: Bldg. 7208 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1611350023	LOW VOLTAGE WIRE #13-4C					14.00	CLF	
Unit values		1.23	15.40	34.00	0.00	0.00		49.40
Totals		17.23	$216	$476	$0	$0		$692
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					6.00	EA	
Unit values		2.00	137.00	55.00	0.00	0.00		192.00
Totals		12.00	$822	$330	$0	$0		$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00	EA	
Unit values		1.00	290.00	27.50	0.00	0.00		317.50
Totals		4.00	$1,160	$110	$0	$0		$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00	EA	
Unit values		0.67	64.00	18.35	0.00	0.00		82.35
Totals		0.67	$64	$18	$0	$0		$82
1611870102	SWITCHING RELAYS					8.00	EA	
Unit values		0.50	11.30	13.75	0.00	0.00		25.05
Totals		4.00	$90	$110	$0	$0		$200
1611950101	1/2" EMT					500.00	LF	
Unit values		0.05	0.38	1.29	0.00	0.00		1.67
Totals		23.50	$190	$645	$0	$0		$835
U16 ELECTRICAL		62	$2,542	$1,689	$0	$0		$4,23

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	62	$2,542	$1,689	$0	$0	$4,23
SALES TAX	5.00%	$127				
MATL MARKUP	-30.00%	($763)				
LABOR MARKUP	-13.40%		($226)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,907	$1,463	$0	$0	$3,36
CONTINGENCY	10.00%					$33
BOND	2.50%					$8
PROFIT	10.00%					$33
JOB TOTAL						$4,12

Estimate: Bldg. 7208 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	62	$2,542	$1,689	$0	$0	$4,231
TOTAL	62	$2,542	$1,689	$0	$0	$4,231
SALES TAX	5.00%	$127				
MATL MARKUP	-30.00%	($763)				
LABOR MARKUP	-13.40%		($226)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,907	$1,463	$0	$0	$3,369
CONTINGENCY	10.00%					$337
BOND	2.50%					$84
PROFIT	10.00%					$337
JOB TOTAL						$4,127

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7210
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.73 PER KW

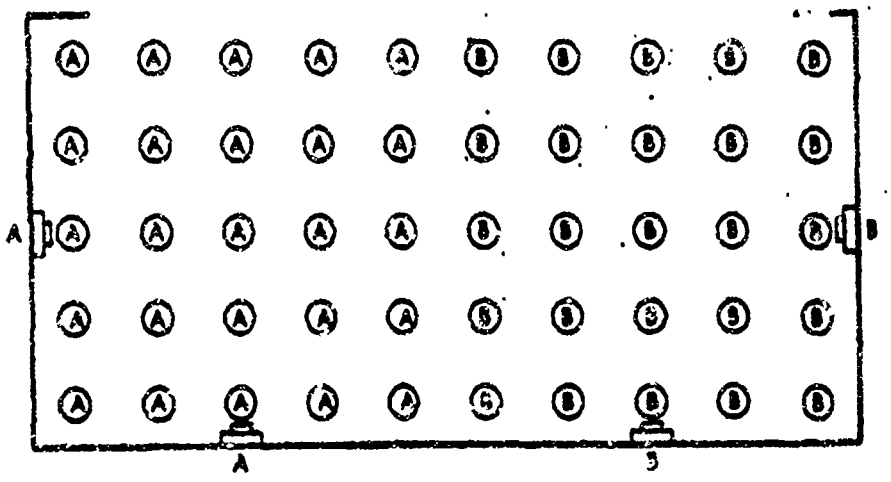
LIGHTING CONTROLLED: 12 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	14	HR/DAY	14
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	*41,580 KWH*	*ECO ENERGY CONSUMPTION*	*36,225 KWH*
	150,696 MJ		*130,010 MJ*
BASELINE DEMAND	*$1,626*	*ECO DEMAND*	*$1,084*

NET ENERGY SAVINGS	20,286 MJ/YR	NET DEMAND SAVINGS	$542 /YR
NET ENERGY SAVINGS	19.23 MBTU/YR	NET DOLLAR SAVINGS	$681 /YR

PHOTOCELL CONTROL LAYOUT
Building 7210



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

53

Estimate: Bldg. 7210 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub		Total
1611350023	LOW VOLTAGE WIRE #18-4C					10.00	CLF	
Unit values		1.23	15.40	34.00	0.00	0.00		49.40
Totals		12.31	$154	$340	$0	$0		$494
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					4.00	EA	
Unit values		2.00	137.00	55.00	0.00	0.00		192.00
Totals		8.00	$548	$220	$0	$0		$768
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00	EA	
Unit values		1.00	290.00	27.50	0.00	0.00		317.50
Totals		4.00	$1,160	$110	$0	$0		$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00	EA	
Unit values		0.67	64.00	18.35	0.00	0.00		82.35
Totals		0.67	$64	$18	$0	$0		$82
1611870102	SWITCHING RELAYS					8.00	EA	
Unit values		0.50	11.30	13.75	0.00	0.00		25.05
Totals		4.00	$90	$110	$0	$0		$200
1611930101	1/2" EMT					360.00	LF	
Unit values		0.05	0.38	1.29	0.00	0.00		1.67
Totals		16.92	$137	$464	$0	$0		$601
U16 ELECTRICAL		46	$2,153	$1,262	$0	$0		$3,415

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	46	$2,153	$1,262	$0	$0	$3,415
SALES TAX	5.00%	$108				
MATL MARKUP	-30.00%	($646)				
LABOR MARKUP	-13.40%		($169)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,615	$1,093	$0	$0	$2,708
CONTINGENCY	10.00%					$271
BOND	2.50%					$68
PROFIT	10.00%					$271
JOB TOTAL						$3,317

Estimate: Bldg. 7210 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	46	$2,153	$1,262	$0	$0	$3,415
TOTAL	46	$2,153	$1,262	$0	$0	$3,415
SALES TAX	5.00%	$108				
MATL MARKUP	-30.00%	($646)				
LABOR MARKUP	-13.40%		($169)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,615	$1,093	$0	$0	$2,708
CONTINGENCY	10.00%					$271
BOND	2.50%					$68
PROFIT	10.00%					$271
JOB TOTAL						$3,317

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7214
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND C HARG $11.78 PER KW

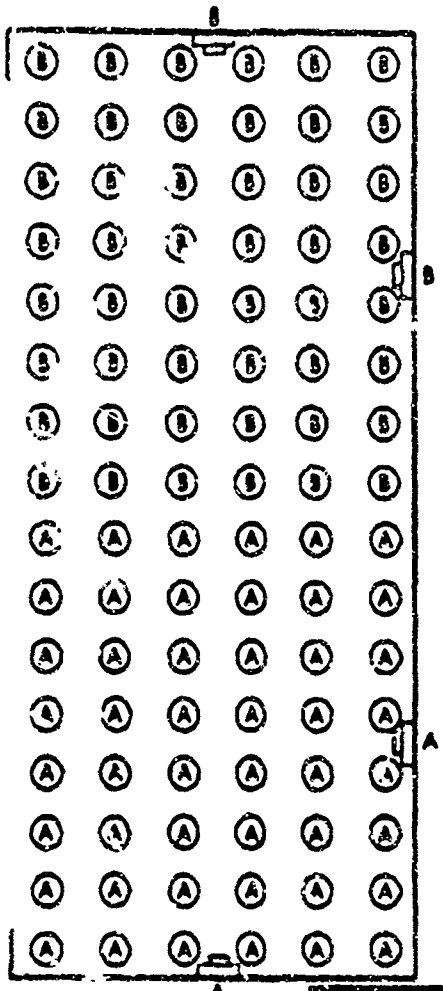
LIGHTING CONTROLLED: 44 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	14	HR/DAY	14
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	49
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	158,722 KWH	ECO ENERGY CONSUMPTION	139,184 KWH
	575,573 MJ		504,774 MJ
BASELINE DEMAND	$5,242	ECO DEMAND	$4,162

NET ENERGY SAVINGS	77,998 MJ/YR	NET DEMAND SAVINGS	$2,081 PER
NET ENERGY SAVINGS	73,163 MBTU/YR	NET DOLLAR SAVINGS	$2,537 /YR

PHOTOCELL CONTROL LAYOUT
Building 7214



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7214 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					14.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49
Totals		17.23	$216	$476	$0	$0	$
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					6.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	197
Totals		12.00	$822	$330	$0	$0	$1,
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317
Totals		4.00	$1,160	$110	$0	$0	$1,
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.38	0.00	0.00	82
Totals		0.67	$64	$18	$0	$0	
1611870102	SWITCHING RELAYS					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25
Totals		4.00	$90	$110	$0	$0	$
1611950101	1/2" EMT					380.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1
Totals		23.50	$190	$645	$0	$0	$
U16 ELECTRICAL		92	$2,842	$1,689	$0	$0	$4,

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Tot
	ESTIMATE TOTAL	62	$2,542	$1,689	$0	$0	$4
	SALES TAX	5.00%	$127				
	MATL MARKUP	-30.00%	($763)				
	LABOR MARKUP	-13.40%		($226)			
	EQUIPT MARKUP	0.00%			$0		
	SUB MARKUP	0.00%				$0	
0 2	TOTAL BEFORE CONTINGENC		$1,907	$1,463	$0	$0	$3
	CONTINGENCY	10.00%					
	BOND	2.50%					
	PROFIT	10.00%					
0 2	JOB TOTAL						$4

Estimate: Bldg. 7214 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	62	$2,542	$1,689	$0	$0	$4,2
TOTAL	62	$2,542	$1,689	$0	$0	$4,2
SALES TAX	5.00%	$127				
MATL MARKUP	-30.00%	($763)				
LABOR MARKUP	-13.40%		($226)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,907	$1,463	$0	$0	$3,3
CONTINGENCY	10.00%					$3
BOND	2.50%					$
PROFIT	10.00%					$3
JOB TOTAL						$4,1

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7218
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

LIGHTING CONTROLLED: 44 KW (AFTER ANY PROPOSED RETROFITS)
(ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

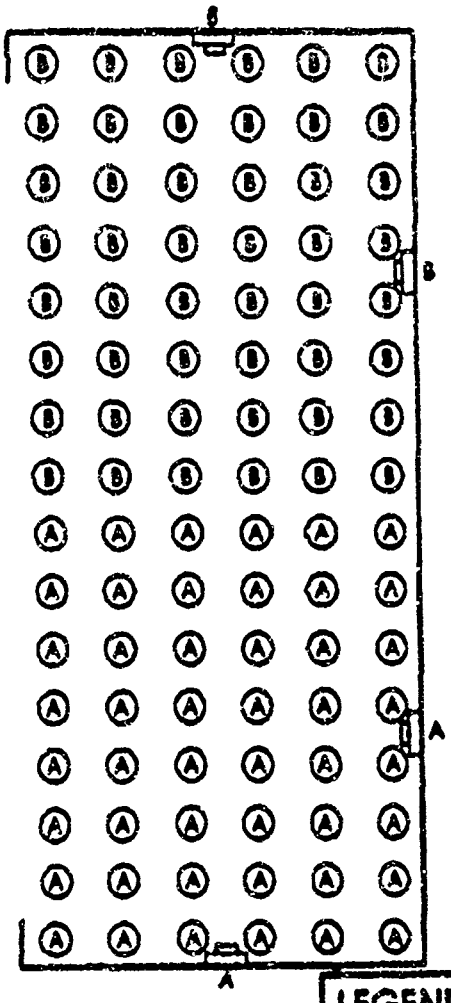
CURRENT USAGE		REVISED USAGE:	
HR/DAY	14	HR/DAY	14
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	166,742	KWH	ECO ENERGY CONSUMPTION	139,104 KWH
	579,673	MJ		500,774 MJ
BASELINE DEMAND	96,242		ECO DEMAND	$4,762

NET ENERGY SAVINGS	77,898 MJ/YR	NET DEMAND SAVINGS	$2,681 /YR
NET ENERGY SAVINGS	73.83 MBTU/YR	NET DOLLAR SAVINGS	$2,537 /YR

PAC

PHOTOCELL CONTROL LAYOUT
Building 7218



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7218 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					14.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.4
Totals		17.23	$216	$476	$0	$0	$69
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					6.00 EA	
Unit values		2.00	37.00	55.00	0.00	0.00	192.0
Totals		12.00	$822	$330	$0	$0	$1,15
1611850101	PHOTO SWITC., 50-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.5
Totals		4.00	$1,160	$110	$0	$0	$1,27
1611870101	LOW VOLTAGE TRANS 115?-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	82.3
Totals		0.67	$64	$18	$0	$0	$8
1611870102	SWITCHING RELAYS					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	23.0
Totals		4.00	$90	$110	$0	$0	$20
1611950101	1/2" EMT					500.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.6
Totals		23.50	$190	$645	$0	$0	$83
U16 ELECTRICAL		62	$2,542	$1,689	$0	$0	$4,23

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	62	$2,542	$1,689	$0	$0	$4,23
SALES TAX	5.00%	$127				
MATL MARKUP	-30.00%	($763)				
LABOR MARKUP	-13.40%		($225)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,907	$1,463	$0	$0	$3,36
CONTINGENCY	10.00%					$33
BOND	2.50%					$8
PROFIT	10.00%					$33
JOB TOTAL						$4,12

Estimate: Bldg. 7218 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	62	$2,542	$1,689	$0	$0	$4,23
TOTAL	62	$2,542	$1,689	$0	$0	$4,23
SALES TAX	5.00%	$127				
MATL MARKUP	-30.00%	($763)				
LABOR MARKUP	-13.40%		($226)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,907	$1,463	$0	$0	$3,36
CONTINGENCY	10.00%					$33
BOND	2.50%					$8
PROFIT	10.00%					$33
JOB TOTAL						$4,12

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7243
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

LIGHTING CONTROLLED: 28 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

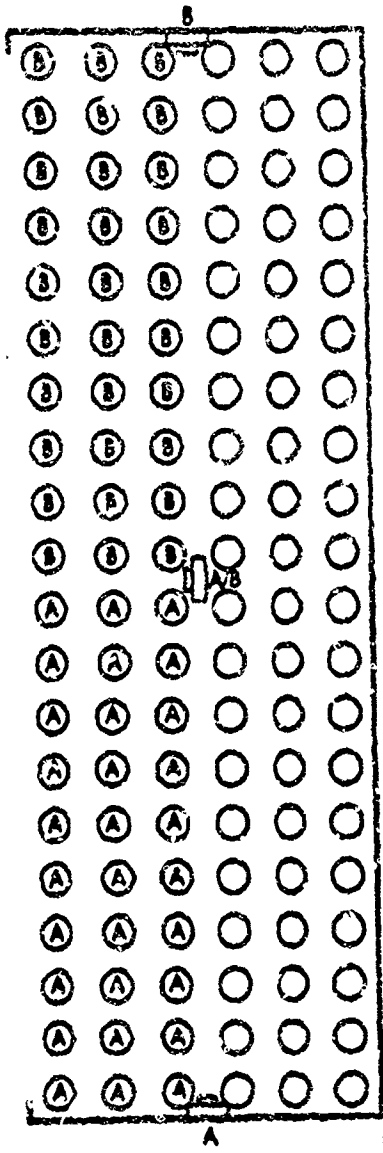
CURRENT USAGE		REVISED USAGE:	
HR/DAY	14	HR/DAY	14
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	94,464 KWH 381,678 MJ	ECO ENERGY CONSUMPTION	66,948 KWH 312,984 MJ
BASELINE DEMAND	$3,967	ECO DEMAND	$2,691

NET ENERGY SAVINGS	48,696 MJ/YR	NET DEMAND SAVINGS	$1,301 /YR
NET ENERGY SAVINGS	46.14 MBTU/YR	NET DOLLAR SAVINGS	$1,586 /YR

PHOTOCELL CONTROL LAYOUT

Building 7243



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7243 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					8.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.40
Totals		9.85	$123	$272	$0	$0	$395
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					4.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.00
Totals		8.00	$548	$220	$0	$0	$768
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					2.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.50
Totals		2.00	$580	$55	$0	$0	$635
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.38	0.00	0.00	82.38
Totals		0.67	$64	$18	$0	$0	$82
1611870102	SWITCHING RELAYS					4.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.05
Totals		2.00	$45	$55	$0	$0	$100
1611950101	1/2" EMT					550.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.67
Totals		25.85	$209	$710	$0	$0	$919
U16 ELECTRICAL		49	$1,569	$1,330	$0	$0	$2,899

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	49	$1,569	$1,330	$0	$0	$2,89
SALES TAX	5.00%	$78				
MAT'L MARKUP	-30.00%	($471)				
LABOR MARKUP	-13.40%		($178)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,177	$1,152	$0	$0	$2,32
CONTINGENCY	10.00%					$23
BOND	2.50%					$5
PROFIT	10.00%					$23
JOB TOTAL						$2,85

Estimate: Bldg. 7243 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job $:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	49	$1,569	$1,330	$0	$0	$2,899
TOTAL	49	$1,569	$1,330	$0	$0	$2,899
SALES TAX	5.00%	$78				
MATL MARKUP	-30.00%	($471)				
LABOR MARKUP	-13.40%		($178)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,177	$1,152	$0	$0	$2,329
CONTINGENCY	10.00%					$233
BOND	2.50%					$58
PROFIT	10.00%					$233
JOB TOTAL						$2,852

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7245
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.76 PER KW

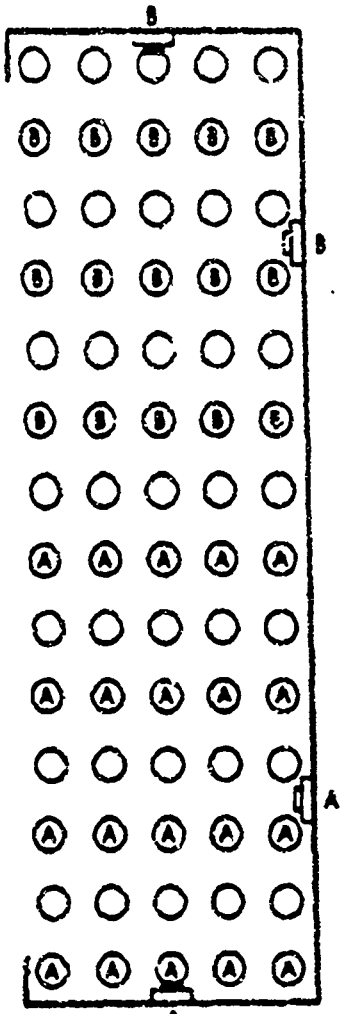
LIGHTING CONTROLLED: 16 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	14	HR/DAY	14
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	50,694 KWH 218,974 MJ	ECO ENERGY CONSUMPTION	30,715 KWH 182,574 MJ
BASELINE DEMAND	82,276	ECO DEMAND	51,517

NET ENERGY SAVINGS	28,480 MJ/YR	NET DEMAND SAVINGS	$759 /YR
NET ENERGY SAVINGS	26.92 MBTU/YR	NET DOLLAR SAVINGS	$925 /YR

PHOTOCELL CONTROL LAYOUT
Building 7245



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7245 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					13.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.4
Totals		16.00	$200	$442	$0	$0	$64
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					5.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.0
Totals		10.00	$685	$275	$0	$0	$96
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.5
Totals		4.00	$1,160	$110	$0	$0	$1,27
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	82.3
Totals		0.67	$64	$18	$0	$0	$8
1611870102	SWITCHING RELAYS					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.0
Totals		4.00	$90	$110	$0	$0	$20
1611950101	1/2" EMT					480.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.6
Totals		22.56	$182	$619	$0	$0	$80
U16 ELECTRICAL		58	$2,391	$1,574	$0	$0	$3,96

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	58	$2,381	$1,574	$0	$0	$3,955
SALES TAX	5.00%	$119				
MATL MARKUP	-30.00%	($714)				
LABOR MARKUP	-13.40%		($211)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,786	$1,363	$0	$0	$3,149
CONTINGENCY	10.00%					$315
BOND	2.50%					$79
PROFIT	10.00%					$315
JOB TOTAL						$3,857

Estimate: Bldg. 7243 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	58	$2,381	$1,574	$0	$0	$3,955
TOTAL	58	$2,381	$1,574	$0	$0	$3,955
SALES TAX	5.00%	$119				
MATL MARKUP	-30.00%	($714)				
LABOR MARKUP	-13.40%		($211)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,786	$1,363	$0	$0	$3,149
CONTINGENCY	10.00%					$315
BOND	2.50%					$79
PROFIT	10.00%					$315
JOB TOTAL						$3,857

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7219
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

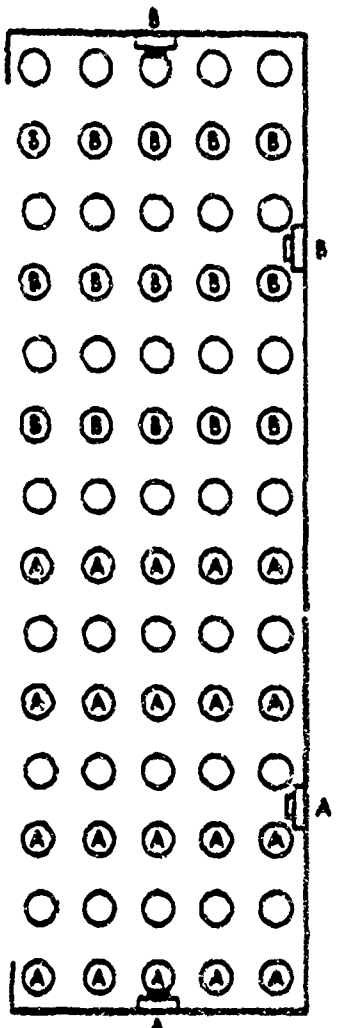
LIGHTING CONTROLLED: 18 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	14	HR/DAY	14
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	59,685 KWH 214,866 MJ	ECO ENERGY CONSUMPTION	30,715 KWH 110,574 MJ
BASELINE DEMAND	12	ECO DEMAND	8

NET ENERGY SAVINGS	28,490 MJ/YR	NET DEMAND SAVINGS	5759 KW
NET ENERGY SAVINGS	27 MBTU/YR	NET DOLLAR SAVINGS	$823 /YR

PHOTOCELL CONTROL LAYOUT
Building 7249



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
⇨ A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7249 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					13.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.40
Totals		16.00	$200	$442	$0	$0	$642
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					5.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.00
Totals		10.00	$685	$275	$0	$0	$960
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.50
Totals		4.00	$1,160	$110	$0	$0	$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	82.35
Totals		0.67	$64	$18	$0	$0	$82
1611870102	SWITCHING RELAYS					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.05
Totals		4.00	$90	$110	$0	$0	$200
1611950101	1/2" EMT					480.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.67
Totals		22.56	$182	$619	$0	$0	$801
016 ELECTRICAL		58	$2,381	$1,574	$0	$0	$3,955

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	58	$2,381	$1,574	$0	$0	$3,...
SALES TAX	5.00%	$119				
MATL MARKUP	-30.00%	($714)				
LABOR MARKUP	-13.40%		($211)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,786	$1,363	$0	$0	$3,149
CONTINGENCY	10.00%					$315
BOND	2.50%					$79
PROFIT	10.00%					$315
JOB TOTAL						$3,857

Estimate: Bldg. 7249 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	58	$2,381	$1,574	$0	$0	$3,955
TOTAL	58	$2,381	$1,574	$0	$0	$3,955
SALES TAX	5.00%	$119				
MATL MARKUP	-30.00%	($714)				
LABOR MARKUP	-13.40%		($211)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,786	$1,363	$0	$0	$3,149
CONTINGENCY	10.00%					$315
BOND	2.50%					$79
PROFIT	10.00%					$315
JOB TOTAL						$3,857

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS
15 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7252
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

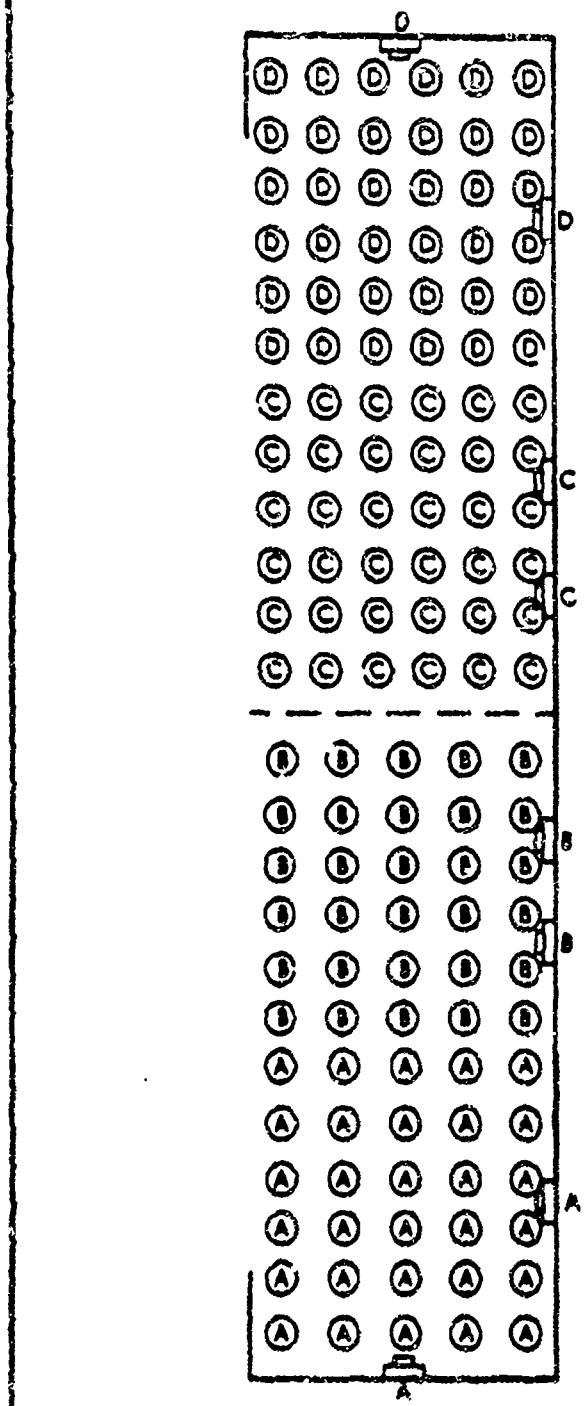
LIGHTING CONTROLLED: 78 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	10	HR/DAY	10
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	6

BASELINE ENERGY CONSUMPTION	302,170 KWH	ECO ENERGY CONSUMPTION	174,966	KWH
	727,836 MJ		420,856	MJ
BASELINE DEMAND	316,992	ECO DEMAND	97,328	

NET ENERGY SAVINGS	97,978 MJ/YR	NET DEMAND SAVINGS	$3,664 /YR
NET ENERGY SAVINGS	92.83 MBTU/YR	NET DOLLAR SAVINGS	$4,238 /YR

PHOTOCELL CONTROL LAYOUT
Building 7262



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7262 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					25.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.40
Totals		30.78	$385	$850	$0	$0	$1,235
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					8.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.00
Totals		16.00	$1,096	$440	$0	$0	$1,536
1612850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					8.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.50
Totals		8.00	$2,320	$220	$0	$0	$2,540
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	82.35
Totals		0.67	$64	$18	$0	$0	$82
1611870102	SWITCHING RELAYS					16.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.05
Totals		8.00	$181	$220	$0	$0	$401
1611950101	1/2" EMT					750.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.67
Totals		35.25	$285	$968	$0	$0	$1,253
C16 ELECTRICAL		99	$4,331	$2,716	$0	$0	$7,047

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	99	$4,331	$2,716	$0	$0	$7,047
SALES TAX	5.00%	$217				
MATL MARKUP	-30.00%	($1,299)				
LABOR MARKUP	13.40%		($364)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$3,248	$2,352	$0	$0	$5,600
CONTINGENCY	10.00%					$560
BOND	2.50%					$140
PROFIT	10.00%					$560
JOB TOTAL						$6,860

Estimate: Bldg. 7262 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	99	$4,331	$2,716	$0	$0	$7,047
TOTAL	99	$4,331	$2,716	$0	$0	$7,047
SALES TAX	5.00%	$217				
MATL MARKUP	-30.00%	($1,299)				
LABOR MARKUP	-13.40%		($364)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$3,248	$2,352	$0	$0	$5,600
CONTINGENCY	10.00%					$560
BOND	2.50%					$140
PROFIT	10.00%					$560
JOB TOTAL						$6,860

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7264
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

LIGHTING CONTHOLLED: 71 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

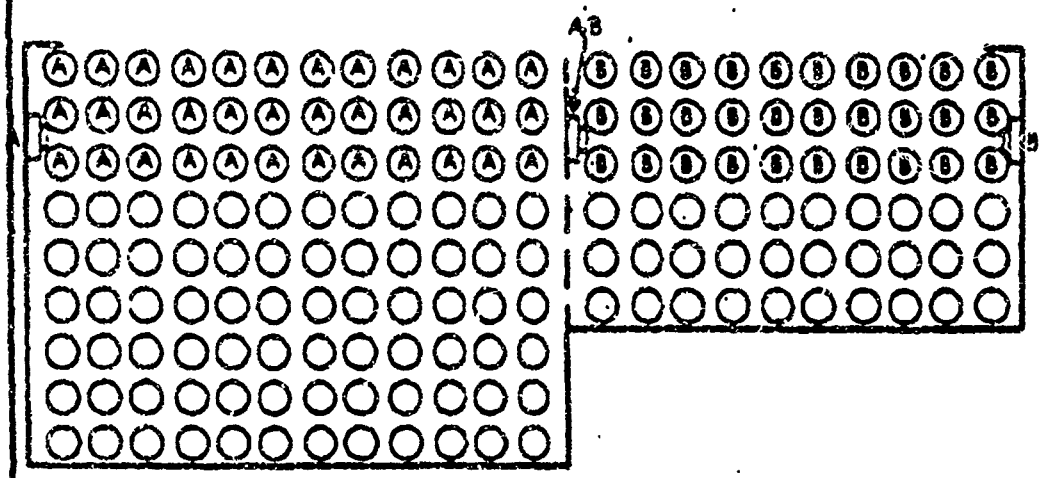
CURRENT USAGE	
HR/DAY	10
DAY/WEEK	5
WEEKS/YR	52
DEMAND (MO/YR)	12

REVISED USAGE:	
HR/DAY	10
DAY/WEEK	5
WEEKS/YR	45
DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	185,228 KWH	
	667,191 MJ	
BASELINE DEMAND	$10,870	
ECO ENERGY CONSUMPTION	168,300 KWH	
	577,368 MJ	
ECO DEMAND	$8,717	

NET ENERGY SAVINGS	89,813 MJ/YR	NET DEMAND SAVINGS	$3,359 /YR
NET ENERGY SAVINGS	85 MBTU/YR	NET DOLLAR SAVINGS	$3,885 /YR

PHOTOCELL CONTROL LAYOUT
Building 7264



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7264 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					12.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.4
Totals		14.77	$185	$408	$0	$0	$59
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					4.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.0
Totals		8.00	$548	$220	$0	$0	$76
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					3.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.5
Totals		3.00	$870	$83	$0	$0	$95
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	82.3
Totals		0.67	$64	$18	$0	$0	$8
1611870102	SWITCHING RELAYS					6.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.0
Totals		3.00	$68	$83	$0	$0	$15
1611950101	1/2" EMT					600.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.6
Totals		28.20	$228	$774	$0	$0	$1,00
U16 ELECTRICAL		58	$1,963	$1,586	$0	$0	$3,54

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	58	$1,963	$1,586	$0	$0	$3,54
SALES TAX	5.00%	$98				
MATL MARKUP	-30.00%	($589)				
LABOR MARKUP	-13.40%		($213)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,472	$1,373	$0	$0	$2,84
CONTINGENCY	10.00%					$28
BOND	2.50%					$7
PROFIT	10.00%					$28
JOB TOTAL						$3,48

Estimate: Bldg. 7264 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Carpbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	58	$1,963	$1,586	$0	$0	$3,549
TOTAL	58	$1,963	$1,586	$0	$0	$3,549
SALES TAX	5.00%	$98				
MATL MARKUP	-30.00%	($589)				
LABOR MARKUP	-13.40%		($213)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,472	$1,373	$0	$0	$2,846
CONTINGENCY	10.00%					$285
BOND	2.50%					$71
PROFIT	10.00%					$285
JOB TOTAL						$3,486

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7208
AREA: HANGAR BAY

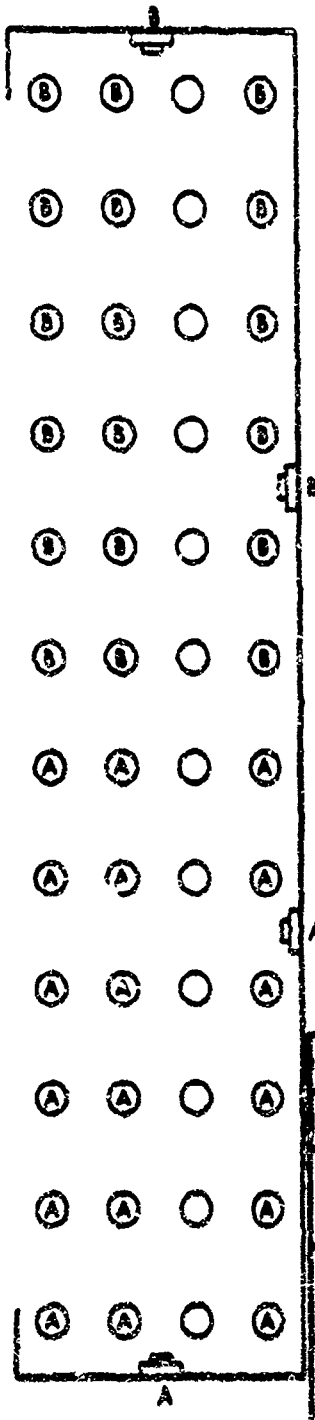
ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.78 PER KW

LIGHTING CONTROLLED: 30 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	18	HR/DAY	10
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	45
DEMAND (MO/YR)	12	DEMAND (MO/YR)	8

BASELINE ENERGY CONSUMPTION	101,008 KWH 363,317 MJ	ECO ENERGY CONSUMPTION	87,498 KWH 314,928 MJ
BASELINE DEMAND	$5,496	ECO DEMAND	$3,664
NET ENERGY SAVINGS	48,389 MJ/YR	NET DEMAND SAVINGS	$1,832 /YR
NET ENERGY SAVINGS	46.43 MBTU/YR	NET DOLLAR SAVINGS	$2,119 /YR

PHOTOCELL CONTROL LAYOUT
Building 7268



LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
(A)	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7268 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					10.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.40
Totals		12.31	$154	$340	$0	$0	$494
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					3.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.00
Totals		6.00	$411	$165	$0	$0	$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.50
Totals		4.00	$1,160	$110	$0	$0	$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	$2.35
Totals		0.67	$64	$18	$0	$0	$82
1611870102	SWITCHING RELAYS					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.05
Totals		4.00	$90	$110	$0	$0	$200
1611930101	1/2" EMT					375.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.67
Totals		17.63	$143	$484	$0	$0	$627
U16 ELECTRICAL		45	$2,022	$1,227	$0	$0	$3,249

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	45	$2,029	$1,227	$0	$0	$3,249
SALES TAX	5.00%	$101				
MATL MARKUP	-30.00%	($507)				
LABOR MARKUP	-13.40%		($164)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,517	$1,063	$0	$0	$2,579
CONTINGENCY	10.00%					$258
BOND	2.50%					$64
PROFIT	10.00%					$258
JOB TOTAL						$3,159

Estimate: Bldg. 7268 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
016 ELECTRICAL	45	$2,022	$1,227	$0	$0	$3,249
TOTAL	45	$2,022	$1,227	$0	$0	$3,249
SALES TAX	5.00%	$101				
MATL MARKUP	-30.00%	($607)				
LABOR MARKUP	-13.40%		($164)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,517	$1,063	$0	$0	$2,579
CONTINGENCY	10.00%					$258
BOND	2.50%					$64
PROFIT	10.00%					$258
JOB TOTAL						$3,159

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

DAYLIGHTING CONTROLS IN HIGH BAY AREAS

BUILDING #: 7272
AREA: HANGAR BAY

ELECTRIC COSTS:
ENERGY CHARG $0.0211 PER KWH
DEMAND CHARG $11.73 PER KW

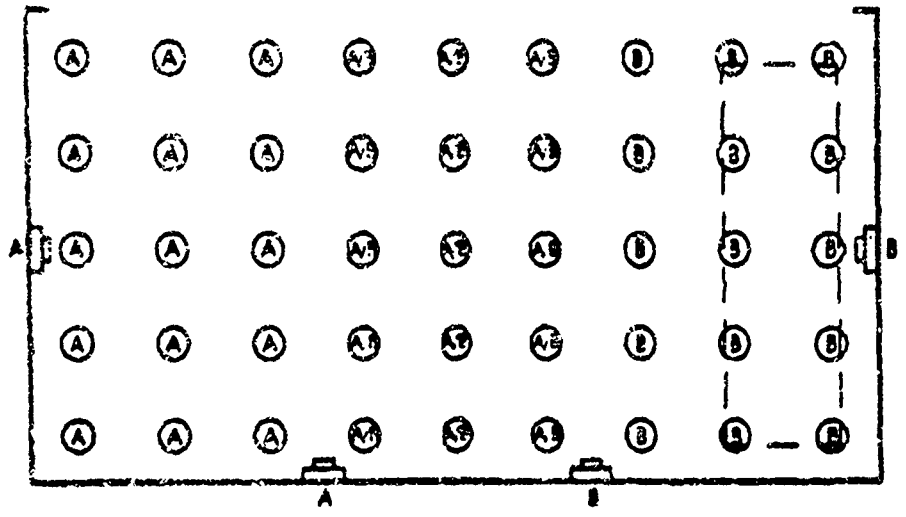
LIGHTING CONTROLLED: 29 KW (AFTER ANY PROPOSED RETROFITS)
(SEE ATTACHED SKETCH FOR DESCRIPTION OF CONTROL SEQUENCE)

CURRENT USAGE		REVISED USAGE:	
HR/DAY	10	HR/DAY	10
DAY/WEEK	5	DAY/WEEK	5
WEEKS/YR	52	WEEKS/YR	52
DEMAND (MO/YR)	12	DEMAND (MO/YR)	12

BASELINE ENERGY CONSUMPTION	73,816	KWH	ECO ENERGY CONSUMPTION	65,619 KWH
	372,939	MJ		236,196 MJ
BASELINE DEMAND	$4,122		ECO DEMAND	$2,744

NET ENERGY SAVINGS	36,742 MJ/YR	NET DEMAND SAVINGS	$1,374 /YR
NET ENERGY SAVINGS	34.82 MBTU/YR	NET DOLLAR SAVINGS	$1,589 /YR

PHOTOCELL CONTROL LAYOUT
Building 7272



Indicates Office Area Enclosed Below HID Fixtures.

LEGEND	
Symbol	Description
○	Light; Controlled by Manual Switch Only
Ⓐ	Light; Letter Inside Designates Controlling Photocell
A	Photocell; Letter Designates which Photocell

Estimate: Bldg. 7272 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1611350023	LOW VOLTAGE WIRE #18-4C					14.00 CLF	
Unit values		1.23	15.40	34.00	0.00	0.00	49.40
Totals		17.23	$216	$476	$0	$0	$692
1611750101	LIGHTING CONTACTOR 600 V, 20 A, 3 POLES					3.00 EA	
Unit values		2.00	137.00	55.00	0.00	0.00	192.00
Totals		6.00	$411	$165	$0	$0	$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					4.00 EA	
Unit values		1.00	290.00	27.50	0.00	0.00	317.50
Totals		4.00	$1,160	$110	$0	$0	$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					1.00 EA	
Unit values		0.67	64.00	18.35	0.00	0.00	82.35
Totals		0.67	$64	$18	$0	$0	$82
1611870102	SWITCHING RELAYS					8.00 EA	
Unit values		0.50	11.30	13.75	0.00	0.00	25.05
Totals		4.00	$90	$110	$0	$0	$200
1611950101	1/2" EMT					500.00 LF	
Unit values		0.05	0.38	1.29	0.00	0.00	1.67
Totals		23.50	$190	$645	$0	$0	$835
U16 ELECTRICAL		56	$2,131	$1,524	$0	$0	$3,655

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	56	$2,131	$1,524	$0	$0	$3,655
SALES TAX	5.00%	$107				
MATL MARKUP	-30.00%	($639)				
LABOR MARKUP	-13.40%		($204)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,598	$1,320	$0	$0	$2,918
CONTINGENCY	10.00%					$292
BOND	2.50%					$73
PROFIT	10.00%					$292
JOB TOTAL						$3,575

Estimate: Bldg. 7272 Date: 20 July 1994
Description: Flightline Facility
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	56	$2,131	$1,524	$0	$0	$3,6
TOTAL	56	$2,131	$1,524	$0	$0	$3,6
SALES TAX	5.00%	$107				
MATL MARKUP	-30.00%	($639)				
LABOR MARKUP	-13.40%		($204)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$1,598	$1,320	$0	$0	$2,9
CONTINGENCY	10.00%					$2
BOND	3.50%					$
PROFIT	10.00%					$2
JOB TOTAL						$3,8

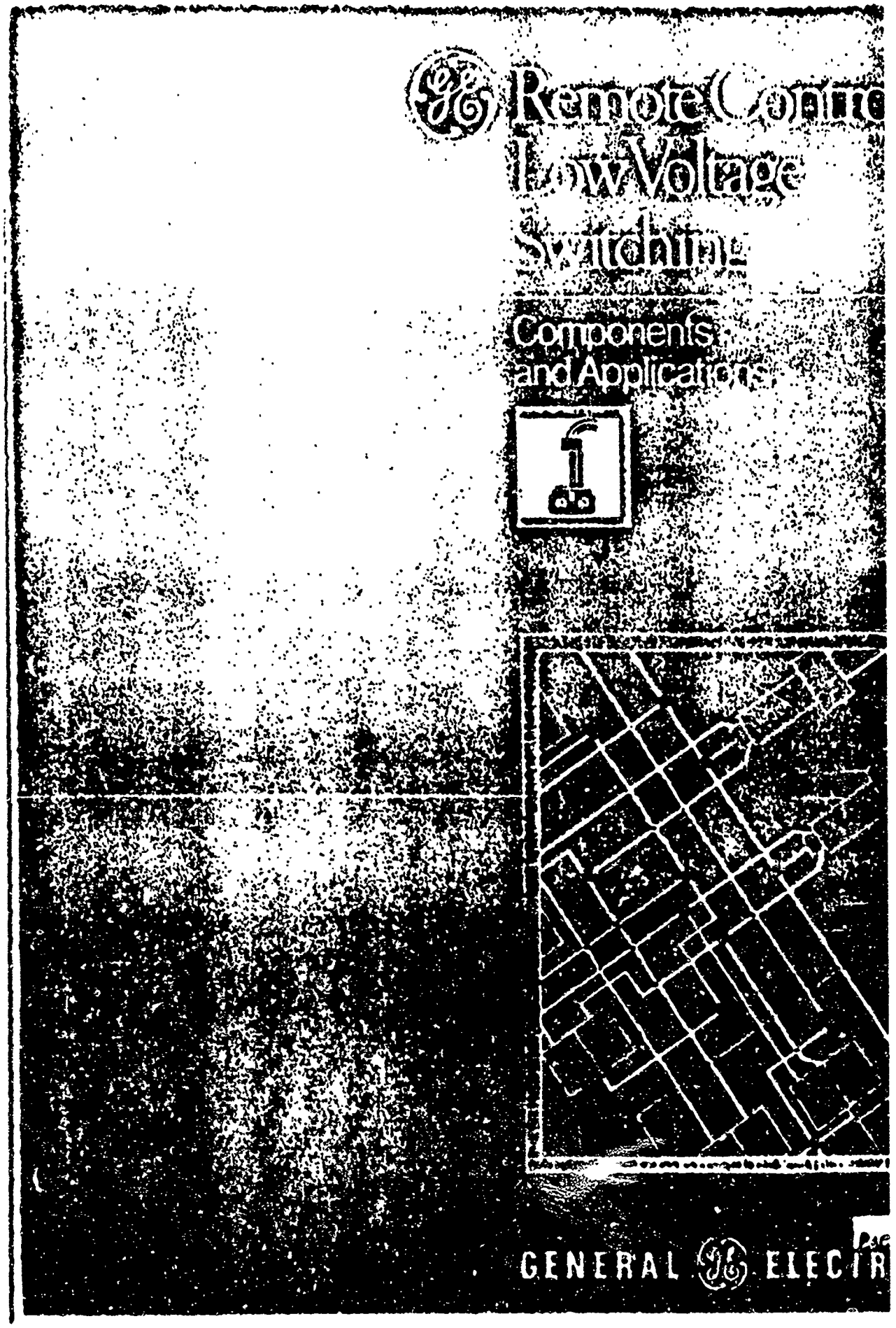
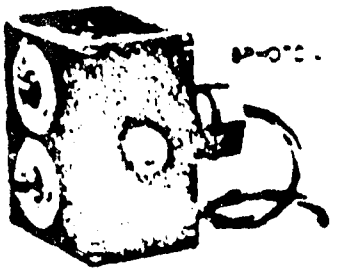

Remote Contro
Low Voltage
Switching
Components
and Applicatio
GENERAL ELECTR

Photo Switches



BPHOTO-4 This unit is used to shed artificial lighting in residential spaces if sufficient outside light levels through a perimeter window or skylight provide the switching signal to the unit or a Master Sequencer or Timeclock Override. The photo switch will turn loads OFF when the exterior light level reaches the set location level and remains there for 15 minutes. When the light level decreases to approximately 15% less than this setting and remains there for 15 minutes, loads will be turned ON. (See the wiring diagram on page 25.

BPHOTO-5 This unit is designed to shed exterior lighting

Specifications	
Catalog Number	BPHOTO-4 (indoor use only) BPHOTO-5 (indoor/outdoor use)
Adjustable Range	BPHOTO-4 50 to 500 lx adjustable BPHOTO-5 5 to 50 lx fixed
Power Requirement	No external source needed
Environment	0° to 55°C (32° to 131°F) non-condensing air temperature 0-95% RH non-condensing (BPHOTO-4) 0-100% RH (BPHOTO-5)
RF Environment	Less than 1 volt/m
Immediate Response Needed	BPHOTO-4 — Yes BPHOTO-5 — No
Hysteresis	15% typ @ 100 lx 20% typ @ 300 lx 25% typ @ 500 lx

5 PROJECT III: INTERIOR LIGHTING AND CONTROLS AT BLANCHFIELD HOSPITAL

FY94 EEAP Lighting & Energy Study, Ft Campbell, KY

This section contains the Project Development Brochures and the DD 1391 Forms for Project III Interior Lighting and Controls at Blanchfield Hospital. Following the DD 1391 Forms is a project summary table, the life cycle cost analysis for the total project, and the life cycle cost analysis, calculations, and cost estimate for the interior lighting and for the controls. The interior lighting replacements include T8 fluorescent fixtures with electronic ballasts (with and without reflectors), and compact fluorescents. The controls portion of the project involves the installation of occupancy sensors in doctors' offices and exam rooms in Building C. Below is a detailed index of the information included in this section.

PDBs 5-2
DD 1391 Forms 5-18
Table 5.1 Project Summary - Hospital Interior Lighting and Controls 5-26
Project LCCA 5-27

LCCA for Interior Lighting: Buildings B & C 5-28
Calculations and Cost Estimates: Interior Lighting - Buildings B & C 5-29
LC41AA for Lighting Controls: Building C - Doctor and Exam Rooms 5-40
Calculations and Cost Estimates: Lighting Controls: Building C 5-41

Catalog Cut Sheets 5-45

facility

INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL
Fort Campbell, Kentucky

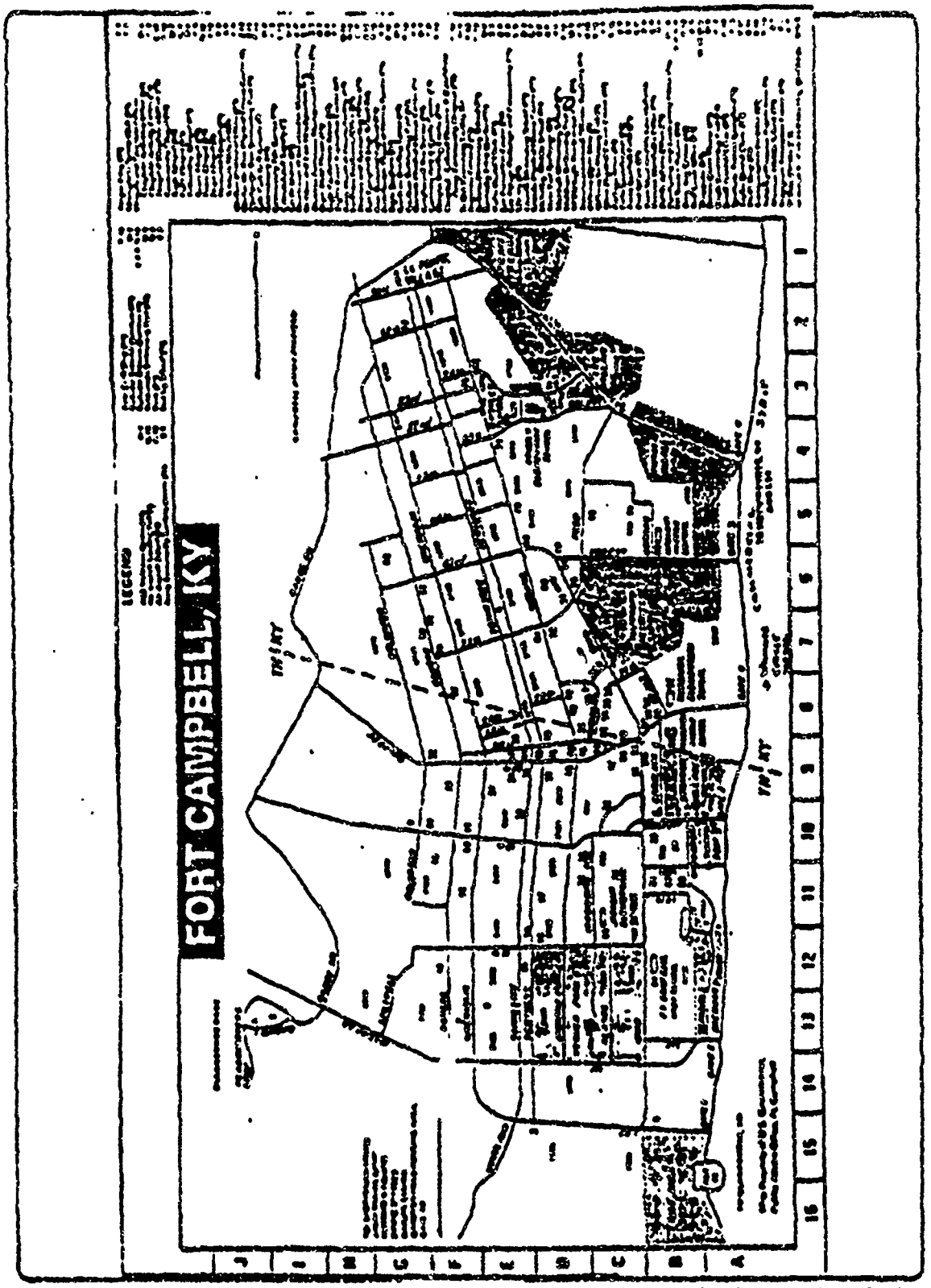
project coordinator for using service

Arlin Wright

functional requirements summary, PDB-1	5-2

OBJECTIVE:

The objective of this project is to replace existing interior lighting with high efficiency fixtures and lamps and install occupancy sensors at Blanchfield Hospital. The replacement of the existing lighting and installation of occupancy sensors will reduce energy consumption and life cycle operating costs for the hospital in accordance with the Army Energy Resources Management Plan (ERMP, and Executive Order 12759.



facilities requirements sketch, PDB- ½ | 5-4

DA FORM 5022-R, Feb 82

TM 5-800-3 A-21

APPENDIX C
DOCUMENTATION CHECKLIST

A. SPECIAL CONSIDERATIONS

	ITEM				
A.1	Coordination for area permits and restricting facility	R			
A.2	Telecommunications [illegible] with USACC and authorization for operation	NR			
A.3	Coordination with state and local governments regarding permits (zoning, building, fencing, construction and operating permits, clearinghouse coordination, etc.)	R	A		
A.4	Assignment of engineer	NR			
A.5	Economic analysis or proposal	R	D		
A.6	Appraisal for new starts	NR			
A.7	Coordination (except at personnel [illegible] coordination with U.S. European command and NATO-owned cost estimates and preparation (include rate of exchange used in estimate)	NR			
A.8	[illegible] [illegible] by the submitted agreement and coordination with state [illegible] [illegible] by request of historic preservation	NR			
A.9	Establishment of assistance centers	NR			
A.10	Coordination with various staff agencies (Provost Marshal, [illegible] security, etc..	R			
A.11	[illegible] of relocation of [illegible] [illegible] to be coordinated	R			
A.12	Resource conservation data	R			

Other Special Considerations (List and number items)

1. See Appendix A

REQUIRED OR NOT REQUIRED = Not to exceed 30 days unless otherwise specified. Enter "R" if item is required and is required for this project. Enter "NR" if item is not required for this project.

TO BE DETERMINED = Applicable or needed but not currently available. Enter date for information needed.

EQUIPMENT ATTACHED = Equipment [illegible] or explained on attached.

DOCUMENT ATTACHED = Specific information is in an existing document [illegible]

*KEY WORDS (Check and insert appropriate letter)

- A = [illegible]
- B = Using Service
- C = Constructor or Service
- D = Designer
- E = Other (Check Comments Attached and explain)

documentation checklist

5-6

DA FORM 5933-A-R, Feb 82

B. SITE DEVELOPMENT

ITEM		Required (See Regulation)	Is Determined	Comments Attached	Documents Attached
B-1	Consultation with the District Office to determine and evaluate flood plain hazards	NR			
B-2	Preparation, submission, and/or approval of the				
(A)	General Site Plan	NR			
(B)	Annotated General Site Plan	NR			
(C)	Sketch Site Plan	NR			
(D)	Facilities Requirements Sketch	R			
B-3	Preparation of				
(A)	Site Survey	NR			
(B)	Subsoil Information	NR			
B-4	Approval by Department of Defense Explosive Safety Board (DDESB) for Safety Site Plan	NR			

Other Site Development Considerations (List one number item)

1. See Project Development Brochure, PDB-1/2

REQUIRED OR NOT REQUIRED = Indicates if the item or information is considered necessary. Enter "NR" if item is known and is required for this project. Enter "NR" if item is known and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter code for anticipated source.

COMMENT ATTACHED = Significant information summarized or discussed and attached.

DOCUMENT ATTACHED = Significant information is in an existing document. Identify and attach.

*SOURCE (Check one or more as appropriate below)

A = DEAF
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

documentation checklist

5-7

DA FORM 5023-S-R, Feb 82

C. ARCHITECTURAL & STRUCTURAL

	ITEM	Required & Provided	* Code Determined	Comments Attached	Documents Attached
C-1	Reconciliation with troop housing programs and requirements	NR			
C-2	Evaluation of existing facilities (including degree of utilization	R	D		
C-3	Approval for removal and retention of existing unsafe facilities	NR			
C-4	Evaluation of off-post community facilities	NR			
C-5	Storage and maintenance facilities (including motor vehicles)	NR			
C-6	Coordination (location, number and size) of facilities with Surgeon General	NR			
C-7	Coordination of aviation facilities with FAA	NR			
C-8	Coordination on traffic control and arrangements with USACC	NR			
C-9	Tabulation of types and numbers of aircraft	NR			
C-10	Evaluation of laboratory, research and development and technical maintenance facilities	NR			
C-11	Coordination checks with Chief of Chaplains	NR			
C-12	Review food service facilities by USATSA	NR			
C-13	Automatic data processing system or equipment applications analysis when ADP system communication comes not contained with existing facilities	NR			
C-14	Coordination plans facilities with U.S. Posts' Service Regional Director	NR			
C-15	Laundry and dry cleaning facilities (consideration with AAFES)	NR			
C-16	Tenant facilities coordination in an installation where sited	NR			
C-17	Facilities for or exposed to [illegible] chemicals, or ammunition - review by DDESB (See also Item E-4)	NR			
C-18	Analysis of deficiencies	R	D		1
C-19	Consideration of alternatives	R	D		2
C-20	Determination whether occupants will include physically handicapped or disabled persons	NR			
C-21	As-built drawings for alterations or additions	R	E		
C-22	Availability of Standard Design or site acceptable designs	NR			
	Other Architectural & Structural (List and number items)				

1. See Supplemental Data
   Detailed Project Justification
   Paragraphs D3.

2. See Supplemental Data
   Detailed Project Justification
   Paragraph D4.

REQUIRED OR NOT REQUIRED - Mark "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED - Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED - Significant information summarized or expressed and enclosed.

DOCUMENT ATTACHED - Specific information is or an existing document which is enclosed.

* "D" MEANS (Check one most appropriate answer)

- A = DPAE
- B = Using Service
- C = Construction Service
- D = Designer
- E = Other (Check Comment Attached and explain)

documentation checklist

5-8

DA FORM 5023-C-R, Feb 82

D. MECHANICAL, ELECTRICAL, & UTILITY SYSTEMS

	ITEM	Required or Not Required	To Be Determined	Comments Attached	Document Attached
	Fuel considerations and cost comparison analysis	R			
D-2	Energy requirements approval (ERA)	R			1
D-3	Conformance with DOD Energy Reduction requirements	R			
D-4	Evaluation of existing and/or proposed utility systems	R			
	Other Mechanical and Utility Systems (List and number items):				
	1. See Special Requirements, Paragraph 3 (SR?-3)				

REQUIRED OR NOT REQUIRED – Mark relevant or as information to comprehension. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter date for information source.

COMMENT ATTACHED – Significant information summarized or explained and attached.

DOCUMENT ATTACHED – Significant information is to be attached documents which is attached.

*BY WHOM (Check one or more appropriate letter)

A = BRAE
B = Using Service
C = [illegible] Installation Service
D = [illegible]
E = [illegible] Attached Comments Attached and explained

documentation checklist

5-9

DA FORM 5023-D-R, Feb 82

E. ENVIRONMENTAL CONSIDERATIONS

ITEM					
E-1	Environmental impact statement				
E-2	EIA conclusions require Environmental Impact Statement				
E-3	Determination of health, environmental or related hazards. Assistance to determine existence of any health, environmental or related hazard may be requested from Aberdeen Proving Ground MD 21010, the Office of the Surgeon General ATTN: DASG-HCH (Army Environmental Hygiene Agency)				
E-4	Air/water pollution permit, coordination with agencies and compliance with standards of regional, state and local laws				
E-5	Corrective measures associated with Environmental Impact Statements or assessments/negative declaration and preamble				
	Other environmental considerations (list, and number items):				
	1. See Supplemental Data Data for Project Justification Paragraph 09.				

ACQUIRED OR NOT REQUIRED – Enter relevant or no information as to items numbers. Enter "R" if item is relevant and is required for this project. Enter "NR" if item is irrelevant, and is not required for this project.

TO BE DETERMINED – Information needed but not currently available. Enter code for information source.

COMMENT ATTACHED – Significant information summarized or explained and attached.

DOCUMENT ATTACHED – Significant information is in or existing document which is attached.

BY WHOM (Check and insert appropriate letter)

A = DPAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and explain)

documentation checklist

5-10

DA FORM 5023-E-R, Feb 82

APPENDIX D
TECHNICAL DATA CHECKLIST

A SPECIAL CONSIDERATIONS

ITEM		
A-1	Design of the interface of ground support equipment with the [illegible]	A-1
A-2	Construct of cabling equipment	A-2
A-3	Functional support equipment (mechanical, electrical, structural, and material) to be [illegible]	A-3
A-4	Equipment in site and installation	A-4
A-5	Other equipment and furniture (C&MA OPE and COE)	A-5
A-6	Special studies and tests (design analysis, compatibility testing, data interchange testing, etc.)	A-6
A-7	Type of construction (permanent, temporary, semi-permanent)	A-7
A-8	Conversion (unique equipment, software, or facilities and [illegible] and design handling and storage requirements, funds used to procure)	A-8
	Other special considerations not [illegible]	

RESPONSE CODE DESCRIPTIONS - [illegible] information needed but not currently available [illegible] [illegible] [illegible]

"D" DESIGNATES - [illegible] needed but not currently available [illegible] [illegible]

CONTRACT ATTACHED - [illegible] information submitted [illegible] and attached

DOCUMENT ATTACHED - [illegible] [illegible]

[illegible] [illegible] [illegible] [illegible]

A - [illegible]
B - [illegible]
C - [illegible]
D - [illegible]
E - Other [illegible] Command Affected and [illegible]

technical data checklist

5-12

DA FORM 5024-a-R Feb 82

TM 5-5[illegible]3

B SITE DEVELOPMENT

	"X"				
B-1	Construction restrictions or obstacles pertaining to				
(A)	site access and preferred construction routes	A	A		
(B)	Airfield clearance, exp plive storage, landing fault, safety, etc	NS			
(C)	Facilities and or functions of adjoining area (structures materials impact)	R	A		
B-2	Real estate actions (acquisition, disposal, lease, right-of-way)	NR			
B-3	Demolition/relocation required (data)				
(A)	Special considerations due to explosives, rad contam chem or bio contamination, asbestos, emissions, toxic gases	R	A		
(B)	Restrictions on disposal of demolished relocated material including hazardous waste	NR			
B-4	Pavement types and requirements (including traffic surveys and NEPA/EIS coordination)	NR			
B-5	Landscape considerations				
(A)	Protection of existing vegetation	R	A		
(B)	Stockpile topsoil	NR			
	Unique Site Development (List and number items)				
	1. There is a possibility, that the existing lighting may contain PCB's in the ballasts.				

REQUIRED BY AEC REGULATIONS - Data to support the information in this checklist (Items B-1 through B-5) is required for all projects (Items "A" and "B" are required only if required for the project)

TO BE DETERMINED - Information needed but not available at this time (Explain reason for information at later time)

COMMENT ATTACHED - Explanatory information or comments are attached to this checklist

DOCUMENT ATTACHED - Specified information is in an existing data report and is attached

"X" in Below Check and Insert Appropriate Letter

A = Brief
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and Explain)

technical data checklist

5-13

DA FORM 5024-R, Feb 82

TM 5-[illegible]

C ARCHITECTURAL & STRUCTURAL

ITEM		Required for Preliminary Design	Required for Detail Design	Required for Construction	Required for Installation
C-1	Vibration producing equipment isolation criteria	R	D		
C-2	Seismic zone and other design and criteria (maximum horizontal earthquake load, high or low risk potential)	NR			
C-3	Projected traffic projections and resultant design criteria (commercial/industrial areas and railroad and waterway access)	NR			
C-4	Unusual foundation requirements (pier, pile, caisson, deep excavation, rock, special treatment, permafrost, soil, coal mining)	NR			
C-5	Designation and strength of areas to be classified	NR			
C-6	Requirements and data for special design projects	NR			
C-7	Unusual floor and roof loads (dock, equipment)	NR			
C-8	Security location (one room, vault, safe, secure area)	NR			
	Other Arch. Interior & Structural Engineering Technical Items				

PREPARED BY (Activity) = Name (optional) of the organization (e.g., Corps, DOE, etc.) or agency and office symbol responsible for preparing the data item. Enter "None" if item is not applicable or required for the project.

TO BE DETERMINED = Information cannot be provided currently because final data for calculation is not available.

SEE REMARKS = Refer to remarks section for additional information.

REQUIRED APPROVAL = Information is to be submitted to and approved by the Government.

* or ** (Under Items and Short Descriptive Title)

A = GFAE
B = Using Service
C = Construction Service
D = Designer
E = Other (Enter Command Activities and Agencies)

technical data checklist

5-14

DA FORM 5024-C-R, Feb 82

D. MECHANICAL, ELECTRICAL & UTILITY SYSTEMS

D-1	Special mechanical requirements or considerations involved (fume hoods, etc.)	NR			
D-2	Special plumbing requirements (e.g., pure water, etc.)	NR			
D-3	Maintenance considerations (access doors, etc.)	R	D		
D-4	Plumbing-domestic: general system type and characteristics (e.g., hot and cold water, compressed air, gas)	NR	D		
D-5	Heating-domestic: general system type and characteristics (e.g., boiler, etc.)	NR			
D-6	Ventilating and air conditioning: general system type and characteristics (e.g., package unit, chilled water)	R	D		
D-7	Electrical-availability: general system type and characteristics (e.g., normal, emergency, uninterruptible power, etc.)	NR			
D-8	Water supply-wastewater treatment: general system type and characteristics (e.g., municipal, package plant)	NR			
D-9	Energy requirements/conservation (e.g., BTU, etc.)	R	A		
D-10	Solar energy evaluation	NR			
	Other Mechanical & Utility Systems (not otherwise listed)				

REQUIRED SOURCE REQUIRED - Information must be obtained from the source listed. Source must be identified and a request made for the data. Source shall be contacted and data received prior to the preparation of the design.

TO BE DEVELOPED - Information needed but not currently available. Data must be developed during performance of the design.

COMMENT ATTACHED - Additional information, comments or explanations are attached.

SECONDARY ATTACHED - Information is available but not of sufficient detail or accuracy for design purposes.

Key words: Check one or more appropriate column(s)

A = Brief
B = Army Source
C = Corps of Engineers Source
D = Design
E = Other (Check Comments column and explain)

technical data checklist

5-15

DA FORM 5024 D-R, Feb 82

E. ENVIRONMENTAL CONSIDERATIONS

ITEM		Required or Not Required	To Be Determined	Comments Attached	Document Attached
E-1	Waste water treatment, air quality, and solid waste disposal criteria	NR			
	Other Environmental Considerations (List and number items)				

REQUIRED OR NOT REQUIRED = Not required or no information to date. Required. Enter "R" if item is required for this project. Enter "NR" if item is unknown and is not required for this project.

TO BE DETERMINED = Information needed but not currently available. Enter date for information if known.

COMMENT ATTACHED = Significant information or comments or explanation attached.

DOCUMENT ATTACHED = Significant information or an existing document available and attached.

POV SHOW (Check one or more appropriate letter)

A = Army
B = Using Service
C = Construction Service
D = Designer
E = Other (Check Comments Attached and Document)

technical data checklist

5-16

DA FORM 5024-E-R, Feb 82

F. FIRE PROTECTION

ITEM		Required or Not Required	To Be Determined	Comment Attached	Document Attached
F.1	Special fire protection systems or features (detection and suppression equipment, hazards, etc.)	N/R			
	Other Fire Protection Considerations (List and number items				

REQUIRED OR NOT REQUIRED - Mark required or not required items as appropriate. Enter "NR" if item is required and is required for the project. Enter "NR" if item is processed and is not required for the project.

TO BE DETERMINED - Information needed but not available at present. Enter date for information when.

COMMENT ATTACHED - Significant information transmitted or discussed and attached.

DOCUMENT ATTACHED - Significant information in the form of documents which should be attached.

DDT ORIGIN (Check one most appropriate letter)

A - BP&S
B - Using Service
C - Construction Schools
D - Designer
E - Other (Check Comments Attached and explain)

technical data checklist

S-17

DA FORM 5024-F-R, Feb 82

TM 5-800-3 9-11

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September

3 INSTALLATION AND LOCATION	4 PROJECT TITLE
Fort Campbell, Kentucky	Interior Lighting Replacements and Controls at B and C Hospital

5 PROGRAM ELEMENT	6 CATEGORY CODE	7 PROJECT NUMBER	8 PROJECT COST ($000)
		ECIP #3	$424.00

9 COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Primary Facility				
Interior Light Fixtures	Lot	1	365.36	365
Subtotal				365
Contingency (10.0 %)				36
Total Contract Cost				401
Supervision, Inspection, And Overhead (5.5%)				22
Total Request				424

10. DESCRIPTION OF PROPOSED CONSTRUCTION

The existing interior lighting is a combination of standard efficiency fluorescent fixtures and incandescent. The proposed project will replace the interior lighting fixtures with T8 fluorescents with high efficiency electronic ballasts and compact fluorescents. The implementation of this project will save 3,545,042 MJ/yr of electric energy. The first year dollar savings is $70,518 and the Savings to Investment Ratio (SIR) is 2.27.

11. REQUIREMENT

Project: The proposed interior lighting project replaces lighting at the following Korean War Barracks with energy efficient lighting: 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 6709, 6710, 6711, 6712, 6713, 6719, 6725, 6726, 6727, 6728, 6730, 6732, 6733, 6909, 6910, 6912, 6917, 6918, 6919, 6920, 6923, 6928, 6929, 6931, 6936, 6937, 6938, 6939, 6940, 6943, 6944, 6945.

Requirement: The project is required to reduce the energy consumption of lighting systems and to comply with the Army Energy Resources Management Plan (ERMP) and Executive Order 12759. The proposed project will reduce annual energy consumption by 9,572,124 MJ/yr and annual energy cost by $148,900.

Current Situation: The existing lighting at Blanchfield Hospital in buildings B and C is inefficient fluorescent and incandescent fixtures. The lighting in the doctors offices and exam rooms in building C are controlled by manual switches and are left on unnecessarily many hours of the day.

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 1

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

Impact if not provided: If the proposed project is not funded, a reduction of 5,545,042 MJ/yr cannot b achieved, and excessive amounts of energy will continue to be used. There will be no contribution to ener reduction goals established for United States Army facilities by Army Headquarters.

Colonel, USA
Commanding

ESTIMATED CONSTRUCTION START:	September 1995	INDE
ESTIMATED MIDPOINT OF CONSTRUCTION:	April 1996	INDE
ESTIMATED CONSTRUCTION COMPLETION:	November 1996	INDE

DETAILED JUSTIFICATIONS

D1. GENERAL.

The proposed project encompasses the replacement of lighting at Blanchfield Hospital, buildings B and exclusive of patients rooms and surgical suites. The project will decrease the energy consumption of th lighting system without reducing light levels except where necessary. The project also installs occupan sensors in the doctors' offices and exam rooms in building C. Lights will be automatically switched off whe not required.

D2. ACCOMMODATIONS NOW IN USE:

The existing lighting systems are composed of standard efficiency fluorescent and incandescent fixtures. Th lighting systems in the doctors' offices and exam rooms in building C have manual controls.

D3. ANALYSIS OF DEFICIENCY

Currently, Blanchfield Hospital buildings B and C are using standard or low efficiency fixtures for lighting. Th purpose of this project is to replace the existing lighting with new light fixtures which are much more efficie along with installing automatic controls in areas where lights are left on unnecessarily. The current deficien results in large amounts of energy usage to maintain adequate lighting

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1 OCT 76

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1 COMPONENT		2 DATE
ARMY	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	23 September 9

3 INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

D4. CONSIDERATION OF ALTERNATIVES:

The only alternatives to the proposed project are to install lower efficiency light fixtures or more sophisticat controls. The disadvantages of using lower efficiency light fixtures is that less energy savings can be realiz without significantly reducing the construction cost. If a less efficient light fixture is selected, the project wo have a lower SIR. Installing more sophisticated controls would significantly increase the construction cost wi not increasing the savings. The project would have a lower SIR.

D5. CRITERIA FOR PROPOSED PROJECT:

The proposed project will conform with all applicable federal and United States Army Regulations.

D6. PROGRAM FOR RELATED EQUIPMENT:

No equipment funded from appropriations other than MCA are required.

D7. DISPOSAL OF PRESENT ASSETS:

Light fixtures at Blanchfield Hospital in buildings B and C will be disposed.

D8. SURVIVAL FACILITIES:

The proposed project is not suitable for inclusion of protective shelters.

D9. SUMMARY OF ENVIRONMENTAL CONSEQUENCES:

The proposed project has been analyzed and will not adversely impact the environment. Energy savi resulting from this project will conserve natural resources.

D10. EVALUATION OF FLOOD HAZARDS AND ENCROACHMENT ON WETLANDS:

It has been determined that these facilities are not located in a flood plain and they do not encroach wetlands.

D11. ECONOMIC JUSTIFICATION:

The proposed project qualifies under ECIP Guidelines in AR-415-15. SIR for the project is 2.27 with a sim payback of 5.33 years.
See Economic Analysis, SRP-1

1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	3. DATE
ARMY		23 September 9

2. INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	

4. PROJECT TITLE	5. PROJECT NUMBER
INTERIOR LIGHTING REPLACEMENTS AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

D12. UTILITY AND COMMUNICATION SUPPORT:

A. No related utility support projects are programmed. Adequate utilities are available to support t project.

B. No telecommunication support is require.

D13. PROTECTION OF HISTORIC PLACES AND ARCHEOLOGICAL SITES:

The project involves the replacement of light fixtures and installation of controls in existing buildings. Rev procecures have been implemented for this project in accordance with 36 CFT 800. The review h established that there will be no effect.

D14. PROJECT DEVELOPMENT BROCHURE (PART 1):

A Project Development Brochure was prepared on 23 September 94 and is attached as a part of t programming documentation.

D15 ENERGY REQUIREMENTS:

The proposed project will reduce present energy consumption by 6,545,042 MJ/yr at the cost savings $79,518 per year. See Energy Requirements Appraisal (ERA) in Special Requirements, Paragraph 3 (SRP.

D16 PROVISION FOR THE HANDICAPPED:

No provisions for the handicapped will be made since the scope of the project is in no way applicable designing for the handicapped.

D17. REAL PROPERTY MAINTENANCE ACTIVITY (RPMA) ANALYSIS:

A. Physical Impact: There will be light fixture removed and replaced by the same number of light fixtur Occupancy sensors will be installed in place of wall mounted switches. No new structures will be add

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	
4 PROJECT TITLE	**5 PROJECT NUMBER**
INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

B. Operations and Maintenance (O&M) impact:

YEAR	O&M NET CHANGE ($000)
1994	-6.1
1995	-6.1
1996	-6.1

C. Backlog of Maintenance and Repair (BMAR) impact:

There will be no net change in the number of fixtures or in fixture life expectancy. There will be no effec on BMAR.

D18. COMMERCIAL ACTIVITIES:

The proposed project is not a "New Start Expansion" as defined by DA Circular 235-1. The project has beer reviewed in light of the requirements of commercial and industrial facilities. It has been determined tha whereas the project does not affect commercial facilities, the requirements of DA Circular 235-1 does not apply

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 94

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

Life Cycle Cost Analysis
Project Title: Interior Lighting Replacements and Control's
Fiscal Year: 1994
Analysis Date 09/23/94
Economic Life: Fifteen (15) Years

1 INVESTMENT

A	CONSTRUCTION COST	385 457
B.	SIOH	19 273
C	DESIGN COST	19 273
D	ENERGY CREDIT CALC	-0-
E	SALVAGE VALUE	-0-
F.	TOTAL INVESTMENT	424 003

2. ENERGY SAVINGS
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST & DISCOUNTED SAVINGS

FUEL	COST $/Btu (1)	SAVINGS MBtu/YR(2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A ELECT	6 18	5256	32 482	12.43	403.752
B DIST					
C. RESID					
D. NG					
E DEMAND			40 974	11.85	485.542
F TOTAL	5256		73 456		889 294

3 NON-ENERGY SAVINGS

A. ANNUAL RECURRING		$8062
(1)DISCOUNT FACTOR	11 85	
(2)DISCOUNTED SAVINGS		371 835

B NON-RECURRING SAVINGS

ITEM	SAVINGS (+) COST(-)(1)	YEAR OF OCCURRENCE	DISCOUNT (2) FACTOR	DISCOUNTED SAVINGS(+) COST (-)(4)
a. Replace Interior				
b. Replace Exterior				
c				
d. Total				

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+)/COST(-) 71.83

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1 DEC 76

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1. COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		23 September 9

3. INSTALLATION AND LOCATION	
Fort Campbell, Kentucky	
4. PROJECT TITLE	5. PROJECT NUMBER
INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

SPECIAL REQUIREMENTS PARAGRAPH 1 (SRP-1) (continued)

4. FIRST YEAR DOLLAR SAVINGS	$ 79,51
5. SIMPLE PAYBACK PERIOD	3 33 Yea
6. TOTAL NET DISCOUNTED SAVINGS	$261 12
7. DISCOUNTED SAVINGS RATIO	2 2

DD FORM 1391
1 DEC 76

PREVIOUS EDITIONS MAY BE USED
UNTIL EXHAUSTED

1 COMPONENT	FY 19 94 MILITARY CONSTRUCTION PROJECT DATA	2 DATE
ARMY		23 September 1

3 INSTALLATION AND LOCATION
Fort Campbell, Kentucky

4 PROJECT TITLE	5 PROJECT NUMBER
INTERIOR LIGHTING REPLACEMENT AND CONTROLS AT BLANCHFIELD HOSPITAL	ECIP #3

SPECIAL REQUIREMENTS PARAGRAPH 3 (SRP-3).

Energy Requirements Appraisal (ERA)

1. Project Description: Replace existing lighting systems with more efficient lighting systen without reducing the light levels. Install occupancy sensors in doctors' offices and exam room
2. Estimated Energy Consumption. The buildings are currently lit by standard efficiency lightin The existing lighting system consumes 7,738,341 MJ/yr of energy. Replacing the existir lighting with high efficiency lighting and installing occupancy sensors will result in 5,545,0(MJ/yr of electrical energy savings, a seventy-two percent (72%) reduction in current ener consumption
3. Energy Sources: No new energy sources are required for the proposed project. The use solar energy for this project is impractical.
4. Energy Use Impacts: The proposed project will substantially reduce the consumption electricity for lighting. The burden on the existing base distribution system will be lessened.
5. Energy Conservation: The proposed project will reduce annual energy consumption b 5,545,042 MJ/Yr with annual energy cost savings of $79,518. The project complies with Arm Resources Management Plan (ERMP) and Executive Order 12759.
6. Energy Alternatives: The proposed project represents the greatest possible reduction in energ consumption seventy-two percent (72%), without reducing the current lighting levels. Th current levels do not exceed the levels recommended by ASHRAE.
7. Energy Effects: The proposed project provides positive environmental effects. It reduces th current energy consumption by seventy-two percent (72%), effectively reducing the consumptic of non-renewable fuel sources. The degrading of environmental standards would not make mo efficient energy sources available
8. Basis of Approval. Total energy requirements and alternative fuel sources have been consider and included in this appraisal or discarded as applicable

TABLE 5.1
PROJECT SUMMARY: HOSPITAL INTERIOR LIGHTING AND CONTROLS

ECO NUMBER	BUILDING NUMBER	GASOLINE SAVINGS (GAL)	ECO RECOVERY (GAL)	ENERGY SAVINGS (KWH)	YEARLY SAVINGS	INVESTMENT COSTS	ANNUAL MAINTENANCE	SPB (YR)	SIR	MATERIAL COSTS	LABOR COSTS	ADDITIONAL COSTS*	TOTAL COST ESTIMATE
1	009	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.43	2.37	[illegible]	[illegible]	[illegible]	[illegible]
2	009	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.70	3.70	[illegible]	[illegible]	[illegible]	[illegible]
TOTALS		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.83	1.27	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

LIFE CYCLE COST ANALYSIS SUMMARY — STUDY: HOSPTOT
ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) — LCCID 1.080
INSTALLATION & LOCATION: FORT CAMPBELL REGION NOS. 4 CENSUS: 3
PROJECT NO. & TITLE: HOSPTOTL INTERIOR LIGHTING & CONTROLS @ HOSPIT
FISCAL YEAR 94 DISCRETE PORTION NAME: LIGHTING
ANALYSIS DATE: 09-14-94 ECONOMIC LIFE 15 YEARS PREPARED BY: J. HOLL

1. INVESTMENT

A. CONSTRUCTION COST	$ 385457.		
B. SIOH	$ 19273.		
C. DESIGN COST	$ 19273.		
D. TOTAL COST (1A+1B+1C)	$ 424003.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	$	0.	
F. PUBLIC UTILITY COMPANY REBATE	$	0.	
G. TOTAL INVESTMENT (1D + 1E - 1F)			$ 424003.

2. ENERGY SAVINGS (+) / COST (-)
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST $/MBTU(1)	SAVINGS MBTU/YR(2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUN SAVINGS
A. ELECT	$ 6.18	5256.	$ 32482.	12.43	$ 403
B. DIST	$ .00	0.	$ 0.	13.56	$
C. RESID	$ .00	0.	$ 0.	15.09	$
D. NAT G	$ .00	0.	$ 0.	15.86	$
E. COAL	$ .00	0.	$ 0.	13.61	$
F. LPG	$ .00	0.	$ 0.	12.64	$
M. DEMAND SAVINGS			$ 40974.	11.85	$ 485
N. TOTAL		5256.	$ 73456.		$ 889

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		$ 6
(1) DISCOUNT FACTOR (TABLE A)	11.85	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		$ 71

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)	$ 71
4. FIRST YEAR DOLLAR SAVINGS 2N5+3A+(3B31/(YRS ECONOMIC LIFE))	$ 79
5. SIMPLE PAYBACK PERIOD (1G/4)	5.33
6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C)	$ 961
7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= (IF < 1 PROJECT DOES NOT QUALIFY)	2.27
8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):	6.68

LIFE CYCLE COST ANALYSIS SUMMARY — STUDY: ECO1HOSP
ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) — LCCID 1.080
INSTALLATION & LOCATION: FORT CAMPBELL REGION NOS. 4 CENSUS: 3
PROJECT NO. & TITLE: ECO1HOSP INTERIOR LIGHTING @ HOSPITAL
FISCAL YEAR 94 DISCRETE PORTION NAME: LIGHTING
ANALYSIS DATE: 09-14-94 ECONOMIC LIFE 15 YEARS PREPARED BY: J. HOLLE

1. INVESTMENT

A. CONSTRUCTION COST	$ 374668.		
B. SIOH	$ 18734.		
C. DESIGN COST	$ 18734.		
D. TOTAL COST (1A+1B+1C)	$ 412135.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	$ 0.		
F. PUBLIC UTILITY COMPANY REBATE	$ 0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)		$	412135.

2. ENERGY SAVINGS (+) / COST (-)
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST $/MBTU(1)	SAVINGS MBTU/YR(2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNT SAVINGS(
A. ELECT	$ 6.18	4672.	$ 28873.	12.43	$ 3588
B. DIST	$ .00	0.	$ 0.	13.56	$
C. RESID	$ .00	0.	$ 0.	15.09	$
D. NAT G	$ .00	0.	$ 0.	15.86	$
E. COAL	$ .00	0.	$ 0.	13.61	$
F. LPG	$ .00	0.	$ 0.	12.64	$
M. DEMAND SAVINGS			$ 40974.	11.85	$ 4855
N. TOTAL		4672.	$ 69847.		$ 8444

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)			$ 60
(1) DISCOUNT FACTOR (TABLE A)	11.85		
(2) DISCOUNTED SAVING/COST (3A X 3A1)			$ 718

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)	$	718
4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))	$	751
5. SIMPLE PAYBACK PERIOD (1G/4)		5.43
6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C)	$	9167
7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= (IF < 1 PROJECT DOES NOT QUALIFY)		2.22
8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):		8.74

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 650 - HOSPITAL
AREA:
AREA USE:
HRS/WEEK: 9
DAYS/WEEK: 5

BUILDING YDR FACT: 277

ELECTRIC COSTS
ENERGY CHARGE: $0.0211 PER KWH
DEMAND CHARGE: $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT
[illegible] 2 LAMP U @ 92 WATTS = 0 WATTS

4 FOOT
[illegible] 1 LAMP @ 46 WATTS = 0 WATTS
58 2 LAMP @ 92 WATTS = 5,336
87 3 LAMP @ 137 WATTS = 2,329
340 4 LAMP @ 184 WATTS = [illegible]

8 FOOT
[illegible] 3 LAMP @ 180 WATTS = 0 WATTS

BASELINE ENERGY CONSUMPTION [illegible] *KWH/YR*
$91,575 MJ/YR
BASELINE DEMAND [illegible] *KW*

REPLACEMENT FIXTURE DATA

2 FOOT
0 2 LAMP U @ 48 WATTS = 0 WATTS

4 FOOT
46 1 LAMP @ 29 WATTS = 1,334 WATTS
378 2 LAMP @ 58 WATTS = 21,950 WATTS
0 3 LAMP @ 87 WATTS = 0 WATTS
0 4 LAMP @ 116 WATTS = 0 WATTS

8 FOOT
0 2 LAMP @ 125 WATTS = 0 WATTS

ECO ENERGY CONSUMPTION *53,270 KWH/YR*
191,772 MJ/YR
ECO DEMAND *22.77 KW*

NET ENERGY SAVINGS 399,803 MJ/YR
NET ENERGY SAVINGS 379 MBTU/YR

NET DEMAND SAVINGS $8,709 /YR
NET DOLLAR SAVINGS $9,057 /YR

FORT CAMPBELL LIGHTING S JRVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 910 - HOSPITAL
AREA:
AREA USE:
HOURS/DAY 12
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT				
3	2 LAMP U @	92 WATTS =	276	WATTS
34	2 LAMP @	45 WATTS =	1,530	WATTS
4 FOOT				
3	1 LAMP @	45 WATTS =	135	WATTS
98	2 LAMP @	92 WATTS =	9,016	WATTS
0	3 LAMP @	137 WATTS =	0	WATTS
0	4 LAMP @	180 WATTS =	0	WATTS
8 FOOT				
0	2 LAMP @	186 WATTS =	0	WATTS

REPLACEMENT FIXTURE DATA

2 FOOT				
3	2 LAMP U @	58 WATTS =	174	WATTS
34	2 LAMP @	29 WATTS =	986	WATTS
4 FOOT				
43	1 LAMP @	29 WATTS =	1,247	WATTS
58	2 LAMP @	58 WATTS =	3,364	WATTS
0	3 LAMP @	87 WATTS =	0	WATTS
0	4 LAMP @	116 WATTS =	0	WATTS
8 FOOT				
0	2 LAMP @	125 WATTS =	0	WATTS

BASELINE ENERGY CONSUMPTION	34,196	KWH/YR	
	123,049	MJ/YR	
BASELINE DEMAND	99.86	KW	
ECO ENERGY CONSUMPTION	18,896	KWH/YR	
	64,029	MJ/YR	
ECO DEMAND	5.77	KW	
NET ENERGY SAVINGS	59,019	MJ/YR	
NET ENERGY SAVINGS	55	MBTU/YR	
NET DEMAND SAVINGS	$733	/YR	
NET DOLLAR SAVINGS	$1,978	/YR	

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 650 - HOSPITAL
AREA:
AREA USE
HOURS/DAY 18
DAYS/WEEK 5

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11 /B PER KW

EXISTING FIXTURE DATA				REPLACEMENT FIXTURE DATA			
2 FOOT				2 FOOT			
20	2 LAMP U	92 WATTS =	1,840 WATTS	20	2 LAMP U @	58 WATTS =	1,160 WATTS
4 FOOT				4 FOOT			
	1 LAMP @	45 WATTS =	0 WATTS	775	1 LAMP @	29 WATTS =	22,475 WATTS
799	2 LAMP @	92 WATTS =	73,508 WATTS	673	2 LAMP @	58 WATTS =	39,034 WATTS
68	3 LAMP @	137 WATTS =	9,316 WATTS	0	3 LAMP @	87 WATTS =	0 WATTS
542	4 LAMP @	184 WATTS =	99,728 WATTS	0	4 LAMP @	116 WATTS =	0 WATTS
8 FOOT				8 FOOT			
	2 LAMP @	189 WATTS =	0 WATTS	0	2 LAMP @	125 WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	836,218	KWH/YR	*ECO ENERGY CONSUMPTION*	279,719	KWH/YR
	3,009,586	MJ/YR		1,006,388	MJ/YR
BASELINE DEMAND	183.36	KW	*ECO DEMAND*	59.77	KW

NET ENERGY SAVINGS	2,002,888	MJ/YR	NET DEMAND SAVINGS	$97,474	/YR
NET ENERGY SAVINGS	1,974	MBTU/YR	NET DOLLAR SAVINGS	829,783	/YR

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1996

EXTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BOR BNG #: 650 - HOSPITAL
AREA:
AREA USE
HOURS/DAY 24
DAYS/WEEK 7

BUILDING VOLTAGE 277

ELECTRIC COSTS
ENERGY CHARGE $0.0711 PER KWH
DEMAND CHARGE $11.78 PER KW

EXISTING FIXTURE DATA

2 FOOT					
	2 LAMP U @	92 WATTS	=	0	WATTS
4 FOOT					
	1 LAMP @	68 WATTS	=	0	WATTS
621	2 LAMP @	92 WATTS	=	57,132	WATTS
	3 LAMP @	137 WATTS	=	0	WATTS
29	4 LAMP @	164 WATTS	=	4,232	WATTS
8 FOOT					
	2 LAMP @	180 WATTS	=	0	WATTS

REPLACEMENT FIXTURE DATA

2 FOOT					
0	2 LAMP U @	68 WATTS	=	0	WATTS
4 FOOT					
419	1 LAMP @	28 WATTS	=	11,880	WATTS
234	2 LAMP @	58 WATTS	=	13,572	WATTS
0	3 LAMP @	87 WATTS	=	0	WATTS
0	4 LAMP @	116 WATTS	=	0	WATTS
8 FOOT					
0	2 LAMP @	120 WATTS	=	0	WATTS

BASELINE ENERGY CONSUMPTION	336,076	KWH/YR	
	1,930,873	MJ/YR	
BASELINE DEMAND	81.36	KW	
ECO ENERGY CONSUMPTION	222,436	KWH/YR	
	865,770	MJ/YR	
ECO DEMAND	25.46	KW	
NET ENERGY SAVINGS	1,128,164	MJ/YR	
NET ENERGY SAVINGS	1,070	MBTU/YR	
NET DEMAND SAVINGS	$4,875	/YR	
NET DOLLAR SAVINGS	$11,765	/YR	

FORT CAMPBELL LIGHTING SURVEY

ECO 1: INTERIOR / EXTERIOR LIGHTING

19 AUGUST 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 650 - HOSPITAL
AREA: DRESSING ROOMS
LAMP USE
HOURS/DAY 18
DAYS/WEEK 5
PEAK USE 1 (1-YES, 2 NO)

ELECTRIC COSTS
ENERGY CHARGE $0.0211 PER KWH
DEMAND CHARGE $11.78 PER KW

BUILDING VOLTAGE 277

EXISTING INCANDESCENTS				COMPACT FLUORESCENT REPLACEMENT			
LAMPS @	52 WATTS =	0 WATTS		0 LAMPS @	13 WATTS =	0 WATTS	
LAMPS @	60 WATTS =	0 WATTS					
LAMPS @	75 WATTS =	0 WATTS		0 LAMPS @	18 WATTS =	0 WATTS	
LAMPS @	90 WATTS =	0 WATTS		48 LAMPS @	26 WATTS =	1248 WATTS	
48 LAMPS @	135 WATTS =	6480 WATTS					

BASELINE ENERGY CONSUMPTION	*39,328 KWH*	*ECO ENERGY CONSUMPTION*	*1,248 KWH*
	169,175 MJ		*4,493 MJ*
BASELINE DEMAND	*6.48 KW*	*ECO DEMAND*	*1.25 KW*

NET ENERGY SAVINGS	104,082 KJ/YR	NET DEMAND SAVINGS	$740 /YR
NET ENERGY SAVINGS	99 MBTU/YR	NET DOLLAR SAVINGS	$1,354 /YR

SYSTEMScorp
SYSTEMS ENGINEERING AND MANAGEMENT CORPORATION

BLDG 050 - HOSPITAL

ELECTRICAL COSTS - ENERGY CHARGE $.02119/KWH
DEMAND CHARGE $ 11.78/KW

ASSUMPTIONS - CHILLER COP = 3

1. DEMAND SAVINGS = [(BASE LINE DEMAND OF LIGHTING) - (ECO DEMAND OF LIGHTING)] ÷ (COP OF CHILLERS * 12 MONTHS/YR * $11.78/KW)

= (532.41 KW - 119.02 KW)/3 * 12 * $11.78/KW

= $10,243/YR (72.90 KW)

2 ENERGY SAVINGS = KW OF COOLING SAVED * .5 * 8760 HR/YR * .0211 $/KWH

= 72.90 KW * .5 * 8760 HR/YR * .0211 $/KWH

= $6709/YR (317,574.8 KWH OR 1.08 MBTU)

3 TOTAL SAVINGS = $10,243 + 6709 = $16,952/YR

Title: Cooling Savings due to Reduction in Lighting Load	Checked By	Date: 6/26/94
Project: Fort Campbell Lighting Study Cost Analysis / Energy Conservation	Prepared By	Sheet No. PAGE 3. 1 OF 1
	Job No. 3-4013-01	

Estimate: Lighting-opt.4 Date: 12 July 1994
Description: Hospital
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City indx:

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0207082119	DEMO. 2X2', 1X4' FLUOR FIXTURES					1023.00 EA	
	Unit values	0.36	0.00	10.00	0.00	0.00	10.00
	Totals	372.37	$0	$10,230	$0	$0	$10,230
0207082121	DEMO. 2X4' FLUOR FIXTURES					1297.00 EA	
	Unit values	0.49	0.00	13.35	0.00	0.00	13.35
	Totals	629.05	$0	$17,315	$0	$0	$17,315
0207082122	DEMO. STRIP/INDUST FLUOR FIXTURES					295.00 EA	
	Unit values	0.32	0.00	8.80	0.00	0.00	8.80
	Totals	94.40	$0	$2,596	$0	$0	$2,596
0207082123	DEMO. INCAND FIXTURES/EXIT LIGHTS					48.00 EA	
	Unit values	0.26	0.00	7.10	0.00	0.00	7.10
	Totals	12.38	$0	$341	$0	$0	$341
U02	SITEWORK	1109	$0	$30,482	$0	$0	$30,482

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
1661307777	L.E.D. EXIT SIGN SINGLE FACE					0.00 EA	
Unit values		1.00	185.00	27.50	0.00	0.00	212.50
Totals		0.00	$0	$0	$0	$0	$0
1661308803	COMP FLUOR, 5" ROUND REC, 2 26W QT OPEN REFLECTOR					48.00 EA	
Unit values		2.29	0.00	63.00	0.00	0.00	63.00
Totals		109.92	$0	$3,024	$0	$0	$3,024
1661309901	REC FLUOR TROFFER PARABOLIC 2X2' W 2 32W T8-U 3" DEEP, 9-CELL					23.00 EA	
Unit values		1.40	114.00	38.50	0.00	0.00	152.50
Totals		32.29	$2,622	$886	$0	$0	$3,508
1661309902	REC FLUOR TROFFER PARABOLIC 2X4' W 2 32W T8 3" DEEP, 12-CELL					0.00 EA	
Unit values		1.51	110.00	41.50	0.00	0.00	151.50
Totals		0.00	$0	$0	$0	$0	$0
1661309903	REC FLUOR TROFFER PARABOLIC 2X4' W 3 32W T8 3" DEEP, 18-CELL					0.00 EA	
Unit values		1.60	142.00	44.00	0.00	0.00	186.00
Totals		0.00	$0	$0	$0	$0	$0
1661309904	REC FLUOR TROFFER PARABOLIC 2X4' W 4 32W T8 3" DEEP, 32-CELL					0.00 EA	
Unit values		1.70	159.00	47.00	0.00	0.00	206.00
Totals		0.00	$0	$0	$0	$0	$0
1661309905	REC FLUOR TROFFER PARABOLIC 1X4' W 2 32W T8 3" DEEP, 9-CELL					0.00 EA	
Unit values		1.40	92.00	38.50	0.00	0.00	130.50
Totals		0.00	$0	$0	$0	$0	$0
1661309906	REC FLUOR TROFFER PARABOLIC 1X4' W 1 32W T8 3" DEEP, 9-CELL					3.00 EA	
Unit values		1.40	88.00	38.50	0.00	0.00	126.50
Totals		4.21	$264	$116	$0	$0	$380
1661309907	REC FLUOR TROFFER PARABOLIC 2X4' W 2 32W T8 3" DEEP, 12-CELL, REFLECTOR					990.00 EA	
Unit values		1.51	133.50	41.50	0.00	0.00	175.00
Totals		1494.90	$132,165	$41,085	$0	$0	$173,250
1661309908	REC FLUOR TROFFER PARABOLIC 2X4' W 3 32W T8 3" DEEP, 18-CELL, REFLECTOR					0.00 EA	
Unit values		1.60	164.30	44.00	0.00	0.00	208.50

Totals	0.00	$0	$0	$0	$0		$0
1661309909	SUR/WALL FLUOR 1X4' W 2 32W T8						
					0.00	EA	
Unit values	1.14	86.00	31.50	0.00	0.00		117.50
Totals	0.00	$0	$0	$0	$0		[illegible]
1661309910	INDUSTRIAL FLUOR 1X4' W 2 32W T8 TWO-PIECE REFLECTOR						
					249.00	EA	
Unit values	1.14	90.00	31.50	0.00	0.00		121.50
Totals	283.86	$22,410	$7,844	$0	$0		$30,254
1661309921	STRIP FLUOR. 1X4' W 2 32W T8						
					46.00	EA	
Unit values	1.14	55.00	31.50	0.00	0.00		86.50
Totals	52.44	$2,530	$1,449	$0	$0		$3,979
1661309933	SUR/WALL VANITY FLUOR 1X2' W 2 17W T6						
					34.00	EA	
Unit values	1.14	78.00	31.50	0.00	0.00		109.50
Totals	38.76	$2,652	$1,071	$0	$0		$3,723
1661309998	SUR FLUOR TROFFER PARABOLIC 1X4' W 1 32W T8 3" DEEP, 9-CELL, REFLECTOR						
					8.00	EA	
Unit values	1.40	135.75	38.50	0.00	0.00		174.25
Totals	11.23	$1,086	$308	$0	$0		$1,394
1661309999	REC FLUOR TROFFER PARABOLIC 1X4' W 1 32W T8 3" DEEP, 9-CELL, REFLECTOR						
					1262.00	EA	
Unit values	1.40	100.75	38.50	0.00	0.00		139.25
Totals	1771.85	$127,147	$48,587	$0	$0		$175,734

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
U16 ELECTRICAL	3800	$290,876	$104,370	$0	$0	$395,246
ESTIMATE TOTAL	4909	$290,876	$134,852	$0	$0	$425,728
SALES TAX	5.00%	$14,544				
MATL MARKUP	-40.00%	($116,350)				
LABOR MARKUP	-13.40%		($18,070)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$189,069	$116,782	$0	$0	$305,851
CONTINGENCY	10.00%					$30,585
BOND	2.50%					$7,646
PROFIT	10.00%					$30,585
JOB TOTAL						$374,668

Estimate: Lighting-opt.4 Date: 12 July 1994
Description: Hospital
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	1109	$0	$30,482	$0	$0	$30,482
U16 ELECTRICAL	3800	$290,876	$104,370	$0	$0	$395,246
TOTAL	4909	$290,876	$134,852	$0	$0	$425,728
SALES TAX	5.00%	$14,544				
MATL MARKUP	-40.00%	($116,350)				
LABOR MARKUP	-13.40%		($18,070)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$189,069	$116,782	$0	$0	$305,851
CONTINGENCY	10.00%					$30,585
BOND	2.50%					$7,646
PROFIT	10.00%					$30,585
JOB TOTAL						$374,668

LIFE CYCLE COST ANALYSIS SUMMARY — STUDY: ECO2HOS
ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) — LCCID 1.080
INSTALLATION & LOCATION: FORT CAMPBELL REGION NOS. 4 CENSUS: 3
PROJECT NO. & TITLE: ECO2HOSP LIGHTING CONTROLS @ HOSPITAL
FISCAL YEAR 94 DISCRETE PORTION NAME: LIGHTING
ANALYSIS DATE: 09-14-94 ECONOMIC LIFE 15 YEARS PREPARED BY: J. HOLL

1. INVESTMENT

A. CONSTRUCTION COST	$ 10789.		
B. SIOH	$ 540.		
C. DESIGN COST	$ 540.		
D. TOTAL COST (1A+1B+1C)	$ 11869.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	$ 0.		
F. PUBLIC UTILITY COMPANY REBATE	$ 0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)		$ 11869.	

2. ENERGY SAVINGS (+) / COST (-)
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST $/MBTU(1)	SAVINGS MBTU/YR (2)	ANNUAL $ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS
A. ELECT	$ 6.18	564.	$ 3609.	12.43	$ 44
B. DIST	$ .00	0.	$ 0.	13.56	$
C. RESID	$ .00	0.	$ 0.	15.09	$
D. NAT G	$ .00	0.	$ 0.	15.86	$
E. COAL	$ .00	0.	$ 0.	13.61	$
F. LPG	$ .00	0.	$ 0.	12.64	$
M. DEMAND SAVINGS			$ 0.	11.85	$
N. TOTAL		564.	$ 3609.		$ 44

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-) $
(1) DISCOUNT FACTOR (TABLE A) 11.85
(2) DISCOUNTED SAVING/COST (3A X 3A1) $

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR SC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4) $ 0.

4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE)) $ 3.

5. SIMPLE PAYBACK PERIOD (1G/4) 3.29

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) $ 44

7. SAVINGS TO INVESTMENT RATIO (SIR)=(5 / 1G)= 3.78
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 13.66

FORT CAMPBELL LIGHTING SURVEY

ECO 2: LIGHTING CONTROLS

19 AUGUST 1994

OCCUPANCY SENSOR SAVINGS AFTER LIGHTING RETROFIT

BUILDING #: 650 - HOSPITAL
AREA: 1 WARDROOMS & OFFICES

WATTAGE CONTROLLED: 23,838 W
ON/OFF PEAL: 0 (Y=1,N=0)

CURRENT USAGE(AFTER PROPOSED RETROFIT)
HR/DAY: 24
DAY/WEEK: 7

ELECTRIC COSTS
ENERGY CHARGE: $0.0211 PER KWH
DEMAND CHARGE: $11.78 PER KW

REVISED USAGE:
HR/DAY: 8
DAY/WEEK: 5

BASELINE ENERGY CONSUMPTION	208,240	KWH	ECO ENERGY CONSUMPTION	37,187	KWH
	749,990	MJ		133,874	MJ
BASELINE DEMAND	23,838	KW	ECO DEMAND	23.84	KW

NET ENERGY SAVINGS	615,821 MJ/YR	NET DEMAND SAVINGS	$0 /YR
NET ENERGY SAVINGS	584 MBTU/YR	NET DOLLAR SAVINGS	$3,616 /YR

Estimate: Hospital-Control Date: 12 July 1994
Description: Hospital
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Index:

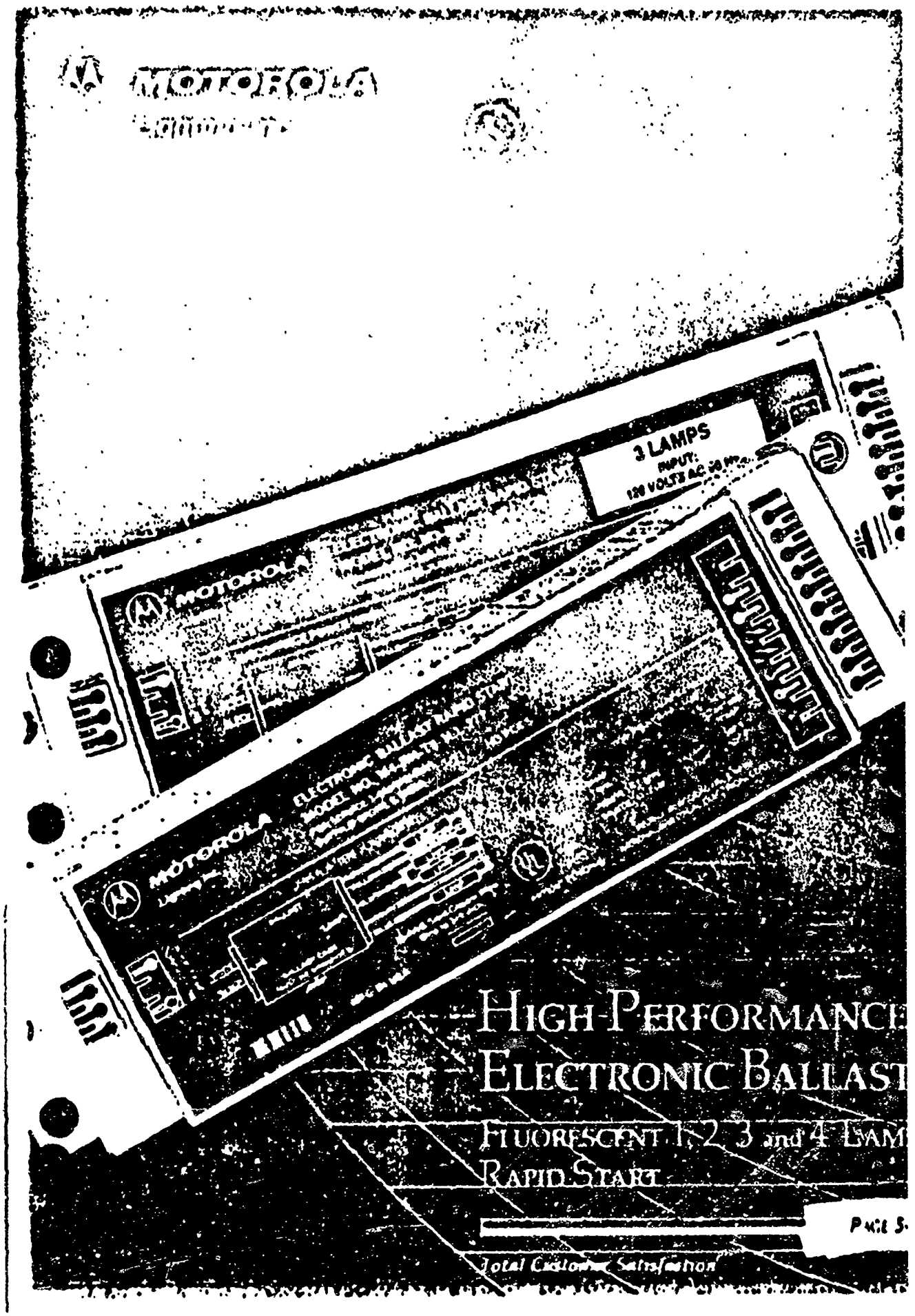
Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
16623011000	OCCUPANCY SENSORS PASSIVE INFRARED, MANUAL OFF SW.					140.00 EA	
Unit values		0.50	60.00	13.75	0.00	0.00	73.7
Totals		70.00	$8,400	$1,925	$0	$0	$10,32
C16 ELECTRICAL		70	$8,400	$1,925	$0	$0	$10,32

Line # Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL	70	$6,400	$1,920	$0	$0	$10,32
SALES TAX	5.00%	$480				
MATL MARKUP	20.00%	$1,280				
LABOR MARKUP	23.44%		$155			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,140	$1,667	$0	$0	$8,80
CONTINGENCY	10.00%					$68
BOND	2.50%					$22
PROFIT	10.00%					$68
JOB TOTAL						$10,78

Estimate: Hospital-Control Date: 12 July 1994
Description: Hospital
Project: Lighting Study Bid Date:
Location: Ft. Campbell Job #:
Sq. footage: City Indx:

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
C16 ELECTRICAL	70	$8,400	$1,925	$0	$0	$10,32
TOTAL	70	$8,400	$1,925	$0	$0	$10,32
SALES TAX	5.00%	$420				
MATL MARKUP	-20.00%	($1,680)				
LABOR MARKUP	-13.40%		($258)			
EQUIPT MARKUP	0.00%			$0		
SUB MARKUP	0.00%				$0	
TOTAL BEFORE CONTINGENC		$7,140	$1,667	$0	$0	$8,80
CONTINGENCY	10.00%					$88
BOND	2.50%					$22
PROFIT	10.00%					$88
JOB TOTAL						$10,78


MOTOROLA
3 LAMPS
INPUT:
MOTOROLA
ELECTRONIC BALLAST RAPID START
MODEL NO.
MOTOROLA
HIGH-PERFORMANCE
ELECTRONIC BALLAST
FLUORESCENT 1, 2, 3 and 4 LAMP
RAPID START
Total Customer Satisfaction

MOTOROLA
Lighting Inc.

Total Customer Satisfaction

Customer Support
1-800-MLI-0089

High Performance Features

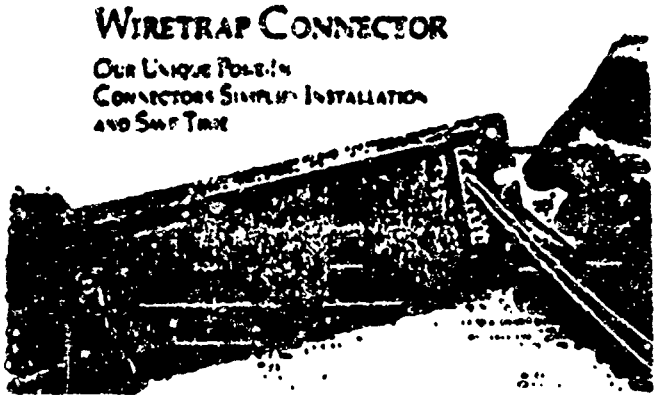
Power Factor	Greater than .98
Total Harmonic Distortion	Less than 10%
Third Harmonic Distortion	Less than 5%
Lamp Current Crest Factor	Less than 1.5
Lamp Current Frequency	Greater than 25 KHz
Lamp Configuration	Series
Lamp Flicker	Less than 2%, Not Visible
Sound Rating	Class A
Projected Life	20 years plus
Connector	Push-in wire trap for 18 gauge (solid wire)
Weight	1.2 lbs
EMI	Meets FCC Part 18, Subpart C

CODES

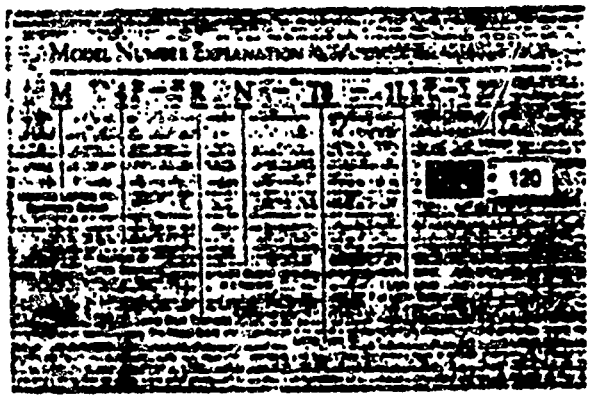
UL Listed	Class P
Transient Protection	Meets ANSI C62.41, Cat. A (Formerly IEEE 587)

Wiretrap Connector

Our Unique Polarity Connectors Simplify Installation and Save Time



Part Number Description



Quality

Motorola's goal of acceptable quality is at Six Sigma or no more than 3.4 defects per million opportunities. Motorola Lighting Inc. designed its electronic ballast to meet the most rigorous performance standards at world class levels. This translates into a highly robust product that goes through extensive environmental stress testing to assure our customers of very low initial defect levels (less than 0.3%) and high reliability (greater than 500,000 hours Mean Time to Failure—MTTF).

The economic ballast life is 20 years when operated at 45°C ambient temperature. Operation of MLI's ballast at 50°C may derate life expectancy by 25%

Six Sigma Quality means "world class" in all that we do at Motorola Lighting Inc., which is part of our commitment to TOTAL CUSTOMER SATISFACTION.

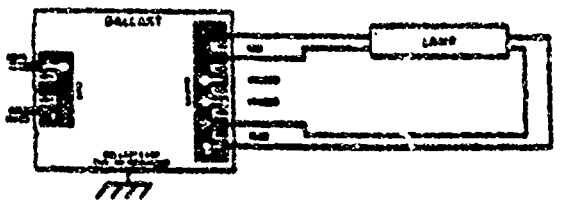
Rapid Start Ballasts

Lamp Type	Rated Lamp Voltage (V)	Lamp Length (FT.)	Model No.	Line Voltage (V)	Max Line Current (A)	Typical Line Current (A)	Typical Input Power (W) Open	Enclosed	Min Starting Temp (F)
1 LAMP T8									
P32T8	32	4	M1 RM T8 ILL 120	120	.31	.24	29	26	50°
P32T8	32	4	M1 RM T8 ILL 277	277	.15	.11	29	26	50°
P25T8	25	3	M1 RM T8 ILL 120	120	.24	.19	23	22	50°
P25T8	25	3	M1 RM T8 ILL 277	277	.10	.08	23	22	50°
P17T8	17	2	M1 RM T8 ILL 120	120	.17	.13	16	15	50°
P17T8	17	2	M1 RM T8 ILL 277	277	.07	.06	16	15	50°
2 LAMP T8									
P32T8	32	4	M2 RM T8 ILL 120	120	.55	.51	61	56	50°
P32T8	32	4	M2 RM T8 ILL 277	277	.24	.21	59	54	50°
P25T8	25	3	M2 RM T8 ILL 120	120	.42	.40	48	45	50°
P25T8	25	3	M2 RM T8 ILL 277	277	.18	.17	46	44	50°
P17T8	17	2	M2 RM T8 ILL 120	120	.27	.24	32	29	50°
P17T8	17	2	M2 RM T8 ILL 277	277	.12	.10	34	31	50°
2 LAMP T12									
P40T12	40	4	M2 RM T12 ILL 120	120	.64	.59	71	69	50°
P40T12	40	4	M2 RM T12 ILL 277	277	.27	.25	68	67	50°
P34T12	34	4	M2 RM T12 ILL 120	120	.54	.50	60	58	50°
P34T12	34	4	M2 RM T12 ILL 277	277	.23	.21	58	57	50°
P40T12	40	4	M2 RM T12 ILL 120	120	.64	.59	72	71	50°
P40T12	40	4	M2 RM T12 ILL 277	277	.27	.25	70	69	50°
P30T12	30	3	M2 RM T12 ILL 120	120	.46	.44	53	52	50°
P30T12	30	3	M2 RM T12 ILL 277	277	.21	.19	52	50	50°
P30T12	25	3	M2 RM T12 ILL 120	120	.40	.37	44	43	50°
P30T12	25	3	M2 RM T12 ILL 277	277	.17	.15	43	42	50°
3 LAMP T8									
P32T8	32	4	M3 RM T8 ILL 120	120	.78	.78	88	87	50°
P32T8	32	4	M3 RM T8 ILL 277	277	.33	.32	88	86	50°
P25T8	25	3	M3 RM T8 ILL 120	120	.61	.59	70	67	50°
P25T8	25	3	M3 RM T8 ILL 277	277	.26	.25	68	66	50°
P17T8	17	2	M3 RM T8 ILL 120	120	.39	.38	47	44	50°
P17T8	17	2	M3 RM T8 ILL 277	277	.16	.16	44	41	50°
3 LAMP T12									
P40T12	40	4	M3 RM T12 ILL 120	120	.92	.88	107	105	50°
P40T12	40	4	M3 RM T12 ILL 277	277	.40	.36	105	103	50°
P34T12	34	4	M3 RM T12 ILL 120	120	.84	.77	91	88	50°
P34T12	34	4	M3 RM T12 ILL 277	277	.41	.33	88	86	50°
P40T12	40	4	M3 RM T12 ILL 120	120	.98	.93	109	107	50°
P40T12	40	4	M3 RM T12 ILL 277	277	.45	.39	107	105	50°
P30T12	30	3	M3 RM T12 ILL 120	120	.78	.67	80	78	50°
P30T12	30	3	M3 RM T12 ILL 277	277	.37	.35	78	76	50°
P30T12	25	3	M3 RM T12 ILL 120	120	.71	.67	82	80	50°
P30T12	25	3	M3 RM T12 ILL 277	277	.30	.30	80	84	50°
4 LAMP T8									
P32T8	32	4	M4 RM T8 ILL 120	120	1.05	1.02	121	118	50°
P32T8	32	4	M4 RM T8 ILL 277	277	.44	.43	118	116	50°
P25T8	25	3	M4 RM T8 ILL 120	120	.81	.80	96	91	50°
P25T8	25	3	M4 RM T8 ILL 277	277	.36	.34	93	90	50°
P17T8	17	2	M4 RM T8 ILL 120	120	.55	.48	67	64	50°
P17T8	17	2	M4 RM T8 ILL 277	277	.23	.19	71	68	50°

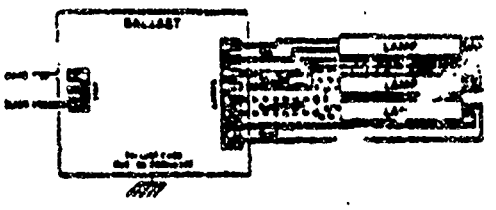
Consult Wall Operating and Shipping Requirements of the Above Lamps. Test Data from Manufacturer Tests and Available on Request from Factory

Wiring Diagrams And Ballast Dimensions

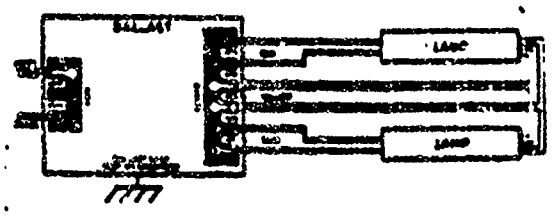
Wiring Diagrams



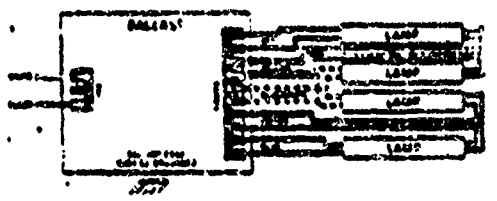
1 LAMP



3 LAMP

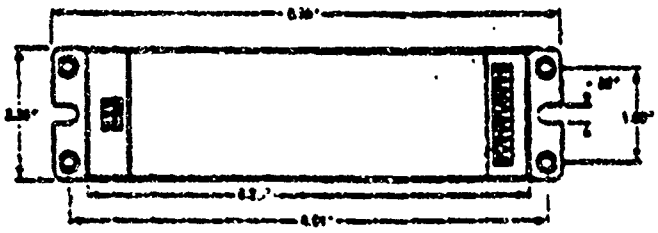


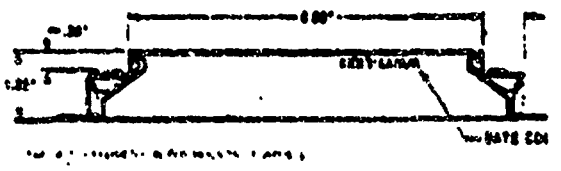
2 LAMP

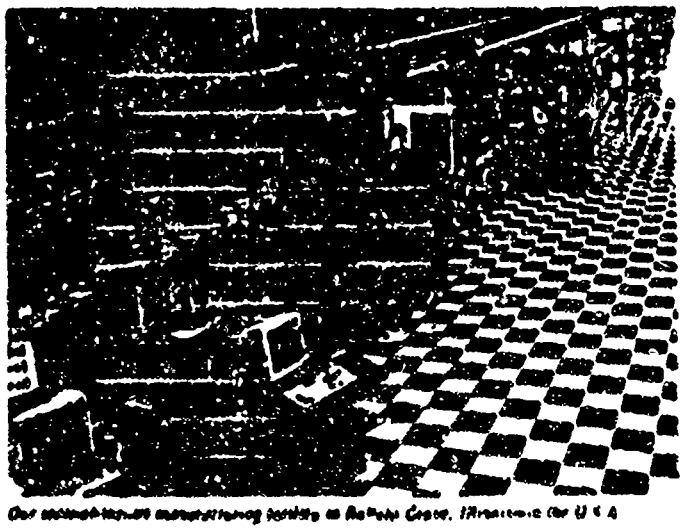


4 LAMP

Ballast Dimensions*







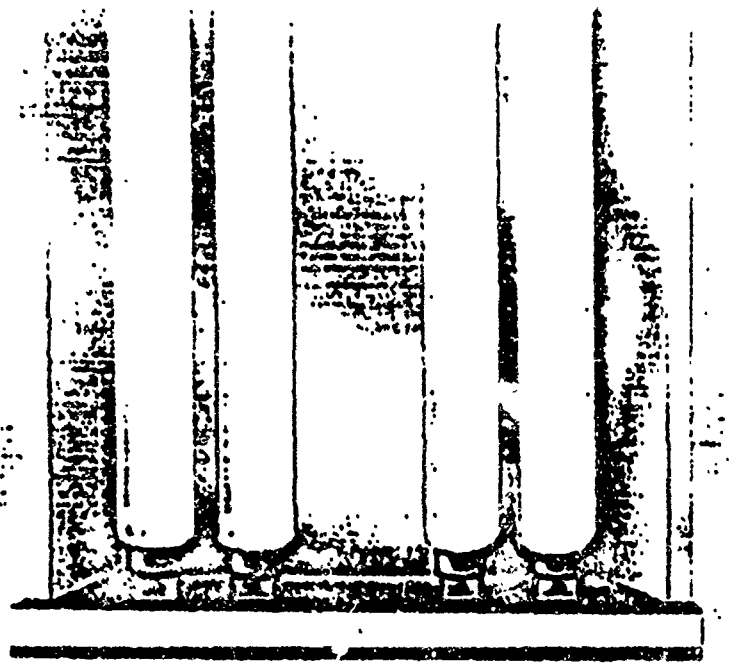
Our automated-layout manufacturing facility in Buffalo Grove, Illinois (for U.S.A.)

MOTOROLA
Lighting Inc.

847 Deerfield Parkway
Buffalo Grove, IL 60089
1-800-MOT-3030

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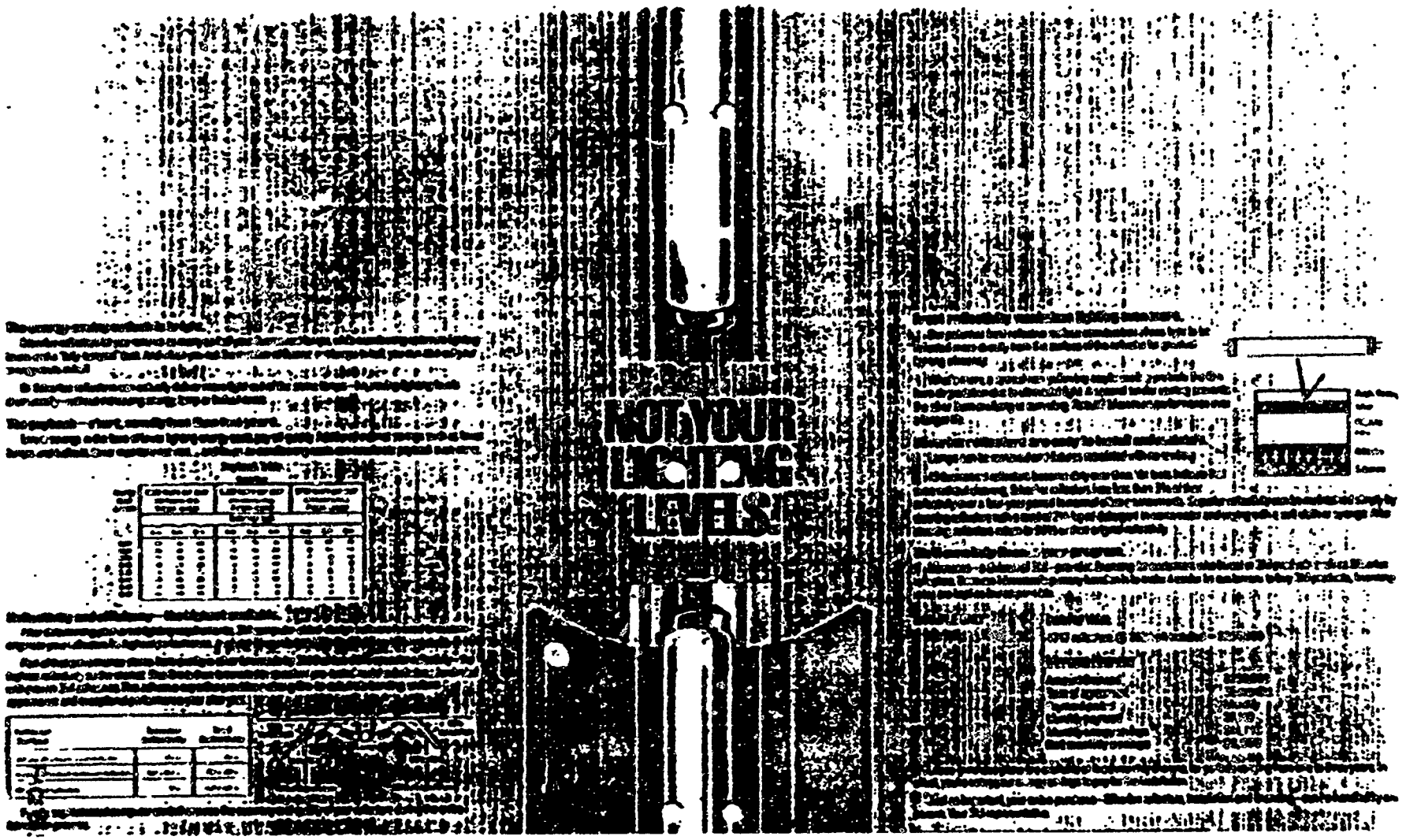
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SILVERLUX™ REFLECTORS CUT YOUR LIGHTING ENERGY COSTS IN HALF.



PAGE 5-4


NOT YOUR
LIGHTING
LEVELS!

SILVERLUX FLUORESCENT REFLECTORS

Cut energy costs in half
or enhance lighting levels
- Pay for themselves in two years or less
- Install and maintain easily
- Warranted for 5 years
- Attractive low-rate financing available
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For more information just call.

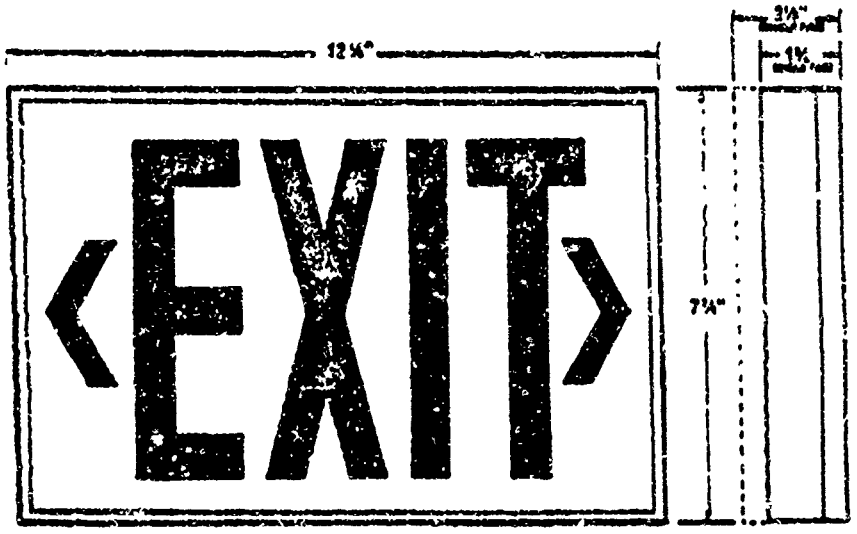
3M is a part of the Green Lights Program—a voluntary non-regulatory program organized by the Environmental Protection Agency (EPA). This program encourages corporations to take advantage of new lighting technologies and design principles that benefit the environment. 3M is a unique member of the program because it participates as both a consumer of electrical lighting energy and as a developer of electrical lighting products. Silverlux reflectors demonstrate 3M's commitment to energy-efficient lighting technologies that reduce energy consumption and pollution while delivering the same or better lighting.

...t costs, not lighting. Innovation working for y

3M Construction Markets
3M Center Bldg. 225-4S-08
St. Paul, MN 55144-1000
612-736-2388

Evenlite LED Exit Lights EV SERIES

The LED of the 21st Century



No Ifs, Ands or Buts.

This is exactly how the EVENLITE 2000 appears! Perfectly even illumination is produced by indirect lighting, so that the LED's are invisible, with no hot spots. All this is provided in the slimmest sign on the market with integral charger and battery.

No competitor comes close to these combined specifications:

- Less than 3 watts total power per face
- Perfect light distribution across face
- Single face only 1⅝" thick
- Double face only 3¼" thick
- Remote unit only ½" thick
- Multiple LED lamps with 20 year unconditional guarantee
- NICAD batteries with 5 year guarantee
- Aluminum housing for light weight and strength
- Universal mount
- Baked enamel, vinyl clad or satin anodized finishes
- Polycarbonate faceplate

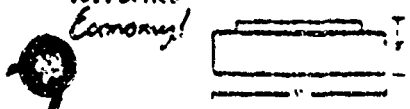
Patent Pending

SHIELD SOURCE INCORPORATED
220 VFW Avenue Gratonville, Maryland 21638
Tel.: (410) 827-8023 Fax: (410) 827-8357

PIONEER

1013 Series

Economy!





UL Listed

STANDARD FEATURES
- White translucent acrylic lens.
- White enamel finished steel pan
- 120 volt class "P" ballast.
- Lamp(s) included

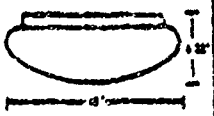
OPTIONS
- High power factor ballast.
- 277 volt ballast
- Theft proof screws

MODEL#	WATTAGE	L	D
PF 1013	[illegible]	11"	3"
PF 1014	[illegible]	14"	3"

ECLIPSE

5012 Series

New!





UL Listed

STANDARD FEATURES
- White translucent acrylic lens.
- White enamel finished steel pan.
- 120 volt class "P" ballast.
- Lamp(s) included.

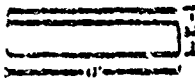
OPTIONS
- High power factor ballast.
- 277 volt ballast.
- Theft proof screws.

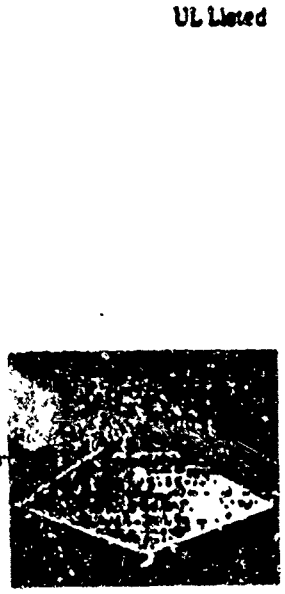
MODEL#	WATTAGE	L	D
EC 5012	[illegible]	12"	4.25"
EC 5015	[illegible]	15"	4.25"

DISCOVERY

3011 Series

Traditional Square!





UL Listed

STANDARD FEATURES
- White translucent acrylic lens
- White enamel finished steel pan.
- 120 volt class "P" ballast.
- Lamp(s) included

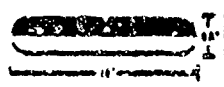
OPTIONS
- High power factor ballast.
- 277 volt ballast.
- Theft proof screws.

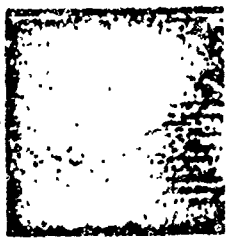
MODEL#	WATTAGE	L	D
DS 3011	[illegible]	11"	3.25"
DS 3014	[illegible]	14"	3.25"

EXPLORER

[illegible] Series

Low Profile!





UL Lis

STANDARD FEATURES
- White vandel resistant lexan lens.
- Black lexan housing.
- 120 volt class "P" ballast.
- White powder coated reflector
- Lamp[illegible]cluded.

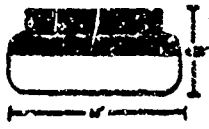
OPTIONS
- High power factor ballast.
- 277 volt ballast.
- White lexan housing.

MODEL#	WATTAGE	L	D
EP 9[illegible]10	[illegible]	11"	3.5"

PLUTO

1303 Series

Vandal!





UL Lis

STANDARD FEATURES
- White heavy gauged lexan lens.
- Corrosion-proof lexan base.
- White powder coated reflector.
- Lamp(s) included.
- 120 volt class "P" ballast.

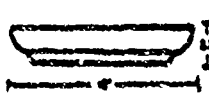
OPTIONS
- High power factor ballast.
- 277 volt ballast.

MODEL#	WATTAGE	L	D
PL[illegible] 1303	[illegible]	10"	4.25"

COSMO

[illegible]400 Series

Low Profile!





UL Lis

STANDARD FEATURES
- White lexan lens.
- White vandal-proof lexan lens.
- 120 volt class "P" ballast
- Lamp(s) included.

OPTIONS
- High power factor ballast.
- 277 volt ballast.

MODEL#	WATTAGE	L	D
CS 1400	[illegible]	14"	[illegible]



UL Listed

ARMSTRONG

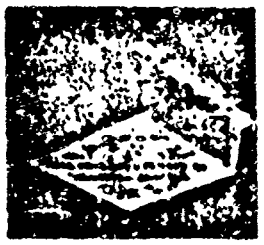
1300 Series

Vandal-Lite!

STANDARD FEATURES
- White heavy gauge lexan lens.
- Corrosion-proof lexan base
- 120 volt class "P" ballast
- Lamp(s) included

OPTIONS
- High power factor ballast
- 277 volt ballast

MODELS	WATTAGE	L	D
AR1300	13 18 26 32	10"	4 5/8"



UL Listed

CENTURY

1500 Series

Vandal-Lite!

STANDARD FEATURES
- White extra strong lexan lens
- White enamel finished steel pan.
- 120 volt class "P" ballast.
- Lamp(s) included.

OPTIONS
- High power factor ballast
- 277 volt ballast.
- Theft proof screws

MODELS	WATTAGE	L	D
CE1010	13 18 26 32	10"	6"

UL Listed

HALO

333 Series

Economy!

STANDARD FEATURES
- Durable polycarbonate base
- Available in white or black.
- White 6" acrylic globe
- 120 volt class "P" ballast
- Lamp included

OPTIONS
- Clear prismatic jar
- White acrylic jar
- 1119" pendule

MODELS	WATTAGE	L	D
HL 333 Globe	9 13 18 26	10"	6"
HL 333 Jar	13 18 26	10"	6"
HL 333 Pendule	13	10"	6"



UL Listed

STRATUS

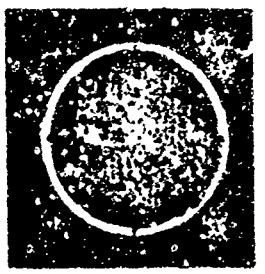
2011 Series

Low Profile Superior!

STANDARD FEATURES
- White translucent acrylic lens.
- White enamel finished steel pan.
- 120 volt class "P" ballast.
- Lamp(s) included.

OPTIONS
- High power factor ballast
- 277 volt ballast.
- Theft proof screws

MODELS	WATTAGE	L
ST 2011	13 18 26 32	15"
ST 2013	13 18 26 32	15"



UL Listed

NOVA

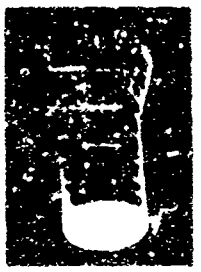
200 Series

Basic-Lite!

STANDARD FEATURES
- Opal polycarbonate diffu
- White corrosion-proof le base.
- White powder coated reflector.
- 120 volt class "P" ballast
- Lamp(s) included.

OPTIONS
- Black or white cage.
- Black lexan housing.
- Theft proof screws

MODELS	WATTAGE	L
NV 200	9 13 18 26	10"



UL Listed

KENNEDY

600 Series

Vandal-Lite!

STANDARD FEATURES
- Brushed satin cast aluminum housing
- Durable white lexan jar.
- 120 volt class "P" ballast
- Lamp included

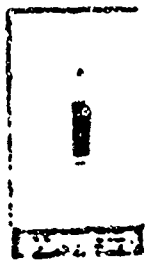
OPTIONS
- Clear prismatic jar
- 6" round globe
- High power factor ballast
- Pull chain

MODELS	WATTAGE	L
KT 600 Jar	13 18 26	9"
KT 600 Globe	9 13 18 26	9"

Switchomat™

The world's best investment in automatic light switching ....with a 6-year proven track record!

$50.00 invested now will earn a $500 to $1,400 return by 1999.



Turns the lights on automatically when you enter....and off after you leave.



Model SOM-500
Automatic wall switch replacement for private offices, conference rooms, restrooms, etc. Takes only minutes to install utilizing the existing wires.

Model SOM-1000
Automatic wall switch replacement for large rooms and classrooms. Takes only minutes to install utilizing the existing wires.

Special Features

Manual lights off switch • Built-in safety neon night light • Shortened recycle time delay during installation • Convenient visible logic key bypass provision in the unlikely event of sensor failure • Vandal resistant design



Ultrasafe

The *Switchomat* is equipped with a metal safety shield in compliance with the highest fire rating standards. Unit is automatically grounded for safety when mounted on an existing metal switch box

- Universal Energy Control, Inc. is able to offer smaller sized esthetic, moderately priced devices because of our exclusive patent #4,876,962.
- Universal Energy Control, Inc. does not use ungrounded potentially dangerous, bulky heat sinks, triacs or other costly trouble prone components
- Universal Energy Control, Inc. devices provide superior operating capabilities and switching even with electronic ballast. A 90 day money back guarantee and 3 to 5 years warranty

PMC

Energy conservation is a terrific investment

Normally all lights are turned on at 8 A.M. and not turned off until 5 P.M. by the custodians. The lights are on a total of 12 h a day. Based on actual tests and evaluations, most people only occupy their private offices for 4 hours a day and the rema [illegible] are spent attending meetings, appointments, lunch, etc. Consequently, daily wasted energy consumption is 8 hou

In an office or meeting room equipped with 8 fluorescent lamps at 40 watts each the total electrical load is 376 watts incl 4 ballasts. Then using ***Switchomat*** the lights are turned off automatically when the last person leaves the room and w [illegible] save the following:

Daily cost savings: 8 Hours x 376 watts = 3 KWH x 8¢ = 24¢
Weekly cost savings: 5 x 24 = $1.20 Yearly cost savings: 52 x $1.20 = $62.40

Yearly savings are conservatively calculated since no holidays or vacations are considered. During these periods even energy is wasted. In addition cooling costs are reduced when the lights are off.

THEORY OF OPERATION A ***Switchomat*** passive infrared detector device reacts to the infrared heat rays transmitted the human body and is a passive non-radiating device.

AESTHETIC FEATURES Facility managers and engineers recognize the real value of installing money-saving featur buildings. The ***Switchomat*** adds prestige and convenience in addition to its contemporary appearance.

DEPENDABILITY You can depend on Unerco's electrical manufacturing and design methods. The ***Switchomat*** proven electrical circuitry. No heat is generated as in other electronic switching devices and therefore complaints or ques from occupants are eliminated. Patent # 4,874,962.

UNIVERSAL ENERGY INC. is a leader in infrared and ultrasonic occupancy sensors to control light and HVAC in sm large rooms. Unisec Inc. the parent company has been manufacturing over 1,000,000 occupancy sensing detection de since 1971 for the security industry.

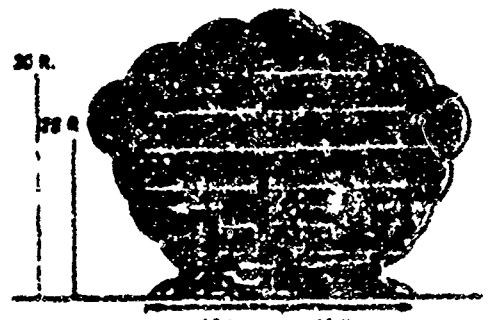


Fig. 1



Fig. 2

SOM 360-A
- Operates incandescent fluorescent fixtures
- 1X CW Ballast 120 VAC 60Hz 600W incandescent
- 1800W Ballast at 277 VAC 60Hz 1½ HP
- Manual light-off switch and lights-on feature
- Color Ivory Size 3" x 5" x 1½" Weight 7oz
- Power consumption: Negligible 3½ mA Watt
- See Fig. 1 for detection pattern

SOM 360-A-2
- 2 sensors with manual on/off lights switches
- Operates incandescent, fluorescent fixtures
- 1800W ballast 120 VAC 60Hz 600W incandescent each cct
- 1800W ballast at 277 VAC 60Hz 1½ HP each circuit
- 2 manual light-off switches
- Color Beige Size 3" x 5" x 1", Weight 7 oz
- Power consumption: Negligible, 600 mA Watt
- See Fig. 2 for detection pattern

SOM 1800-A
- Operates incandescent fluorescent fixtures
- 1X CW Ballast 120 VAC 60Hz 600W incandescent
- 1800W Ballast at 277 VAC 60Hz 1½ HP
- Manual light-off switch
- Color Beige Size 3" x 5" x 1½" Weight 7oz
- Power consumption: Negligible 3½ mA Watt
- See Fig. 2 for detection pattern

SOM 1800-B
- Operates incandescent fluorescent fixtures
- Maximum 600 watts to Maximum 2400 watts at 120V
- Maximum 1800 watts to Maximum 4800 watts at 277V ballast
- Manual light-off switch
- Color Beige Size 3" x 5" x 1", Weight 10 oz
- Power consumption: Negligible 600 mA Watt
- See Fig. 2 for detection pattern

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