



Aloha
SYSTEMS

Evaluation, Measurement, and Verification (EM&V) Report

**Los Angeles County ISD
2002-2003 Energy Efficiency Program
CPUC Non-Utility Program #156-02**

An Analysis Prepared for:

Eli W. Kollman
Energy Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102-3298

May 20, 2004

Dr. Mark S. Shirilau
Robert A. Prodonovich
Amichai Kotev
Luis F. Sanchez

Los Angeles County Internal Services Department
2002-03 Energy Efficiency Program #156-02
EM&V Executive Summary

Our evaluation of this program demonstrated that it fully met its goals. We also developed an extremely robust body of actual evaluation data that prove the accuracy and the reasonableness of most of the assumptions underlying the project. Additionally, we had the opportunity to physically inspect a large number and wide variety of county facilities, and thereby observe the on-going need for continuation of such programs well into the foreseeable future.

The program involved direct installation of lighting retrofits, lighting control systems, time clocks on chillers, variable-frequency drives on air handler fans, and the replacement of one 1200-ton chiller. All of these categories met or exceeded their installation goals, and *ex-ante* evaluation of gross annual savings (7,287,846 kWh/yr) was 102% of the savings goals of the revised program plan (7,167,217 kWh/yr). This revised plan in turn represented various modifications throughout the program that significantly increased the savings above the 6,008,189 kWh/yr goal upon which the program was approved for funding. This was accomplished by the county while maintaining the original budget, making it even more cost-effective than what was originally proposed.

Complete *ex-post* evaluation was also conducted in which we evaluated the true energy savings of each measure installed. The *ex-post* savings will be between 5.7 and 6.5 GWh/yr based upon how rigidly the lighting controls are finally optimized. In the aggregate, the lighting retrofit, chiller timeclock, and VFD installation categories achieved true savings as predicted, though individual sites sometimes varied up or down. The chiller replacement produced estimated energy savings 42% above the predicted amount.

The only problem area was with lighting control systems. In facilities where lights were already being reasonably controlled, either manually or by other systems, the new control systems were unable to achieve significant incremental savings. This problem can be rectified in future installations through interactive EM&V. All control systems must be metered before and after installation. The pre-installation EM&V metering should be done sufficiently early for the county to be able to use the load profile to determine the site's suitability and if necessary replace an already-well-controlled building with one that is not. Our EM&V process demonstrated that buildings which are commonly assumed to be lit throughout the night are not necessarily so lit.

We also discuss why 1.0 is a more realistic net-to-gross ratio than the standard 0.8 value. The county has an ample supply of buildings in which to make improvements but extremely limited funds. Within any reasonably expected PGC funding level, we are confident that the funds produce efficient that would not otherwise occur.

Customer satisfaction with the retrofits was demonstrated as extremely good. Managers of local facilities typically reported very high satisfaction with the new lights, even in areas where pre-retrofit satisfaction was very low.

Table of Contents

Summary	1
Project Description	1
Total Annual Energy Savings Estimates from all Measures	1
Project Locations.....	1
EM&V Process	5
Lighting Measures	6
Lighting Controls	6
Time Clocks	7
VFD Retrofit	7
Chiller Retrofit	7
Benefits Achieved by Interactive EM&V	8
What Constitutes <i>Ex-Ante</i> ?.....	8
Ex-Ante Savings Calculations	11
Savings of Individual Sites	11
Individual Site Annual Energy Savings Estimates	12
Ex-Post Savings Calculations.....	14
Discussion of Measures and Success	15
Lighting Retrofits	15
Lighting Controls	15
Time Clocks on Chillers.....	16
Variable-Frequency Drives	16
High-Efficiency Chiller	16
Customer Satisfaction Survey	17
Net-to-Gross Ratio	17
Conclusions	18

Individual Sites

01. District Attorney Warehouse
02. Warm Springs Rehab
03. Bellflower Parking Structure
04. LA Superior Court Warehouse
05. DCSS Senior Center

Table of Contents

- 06. Willowbrook Child Care Center
- 07. DCSS Florence / Firestone
- 08. ISD – DIST.3
- 09. Sheriff Field Operations
- 10. ISD Monrovia Auto Shop
- 11. Sheriff-Central Command
- 12. Biscailuz Center
- 13. Animal Control #6
- 14. DPSS GAIN
- 15. Claremont Public Library
- 16. West Covina Public Library
- 17. Brakensiek Public Library
- 18. North Services Agency
- 19. Rio Hondo Courts Parking
- 19A. Montebello Public Library
- 20. DPSS South Family AP
- 21. Southwest DPSS
- 22. Downey Administration Center
- 23. ISD Eastern Avenue Complex
- 24. Sheriff's Star Center
- 24A. LA Public Works Department
- 25. ISD Parking Lot
- 26. ISD 1102/1104/1110
Time Clocks
- 30. Downey Administration Center
- 33. Harbor UCLA Medical Center

Los Angeles County Internal Services Department 2002-03 Energy Efficiency Program #156-02 Evaluation, Measurement, and Verification Report

Project Description

The Los Angeles County Internal Services Department Energy Efficiency Program sponsored through the California Public Utilities Commission's Third Party Local Program consists of installation of lighting retrofits, lighting control systems, time clocks on chillers, variable-frequency drives on air handler fans, and the replacement of one 1200-ton chiller. All of the measures are installed in LA County buildings located within the Southern California Edison service territory.

The project clearly met its revised goals, and significantly exceeded its original goals while maintaining the original budget. We developed hard factual evidence supporting the success of this program and demonstrating its viability for future expansion within Los Angeles County as well as other local government agencies.

The project as presented to the CPUC did not elaborate specific measures within specific sites. The sites were for the most part determined before the program was implemented, and the energy savings estimates for those specific sites were used to estimate the program's overall performance. As the project was implemented, some changes were made to the site list, primarily the addition of a few sites made possible by lower than anticipated project costs.

The following table provides the program-wide savings estimates and calculations.

Total Annual Energy Savings Estimates from All Measures	
Original Program Plan	6,008,189 kWh
Revised Program Plan	7,167,217 kWh
<i>Ex-Ante</i> Evaluation	7,287,846 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	5,720,078 kWh
Potential <i>Ex-Post</i> Savings	6,522,474 kWh

Project Locations

The project was installed in various facilities of several departments of the Los Angeles County government that are within the SCE service territory. There was neither a rigid definition of sites nor a rigid order in which they were presented in various documents. We developed a site numbering scheme, based upon one particular spreadsheet provided by the county early in the program. For the purpose of this evaluation report, the sites are numbered as follows:

- 1** District Attorney Warehouse
5300 Harbor Street
Commerce, CA 90747
SCE Account 3-018-5645-68 and 3-018-5646-01
- 2** Warm Springs Rehab.
38200 Lake Hughes Road
Castaic, CA 91384
SCE Account 3-001-4069-07 and 3-002-8744-09
- 3** Bellflower Parking Structure
9951 Flower Street
Bellflower, CA 90706
SCE Account 3-000-5847-64
- 4** Los Angeles Superior Court Warehouse
270 W. Duarte Boulevard
Monrovia, CA 91768
SCE Account 3-009-9447-57
- 5** DCSS Senior Center Willowbrook
12915 S. Jarvis Avenue
Los Angeles, CA 90061
SCE Account 3-002-9890-07
- 6** Willowbrook Child Care Center
12829 S. Jarvis Avenue
Los Angeles, CA 90061
SCE Account 3-003-5328-45
- 7** DCSS Florence/Firestone
7807 S. Compton Avenue
Los Angeles, CA 90001
SCE Account 3-001-4068-86
- 8** ISD District 3 Facilities Operation
11236 Playa Court
Culver City, CA 90230
SCE Account 3-002-7515-55
- 9** Sheriff Field Operations Region II
3010 E. Victoria Street
Rancho Dominguez, CA 90221
SCE Account 3-001-4064-11

- 10** ISD Monrovia Auto Shop and Warehouse
1703 Mountain Avenue
Monrovia, CA 91016
SCE Account 3-002-4370-24 and 3-002-4369-49
- 11** Sheriff Central Communications Center
1277 N. Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-003-5328-45
- 12** Biscailuz Center – Sheriffs
1060 N. Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-000-0599-41
- 13** Animal Control #6
31044 Charley Canyon Rd.
Castaic, CA 91384
SCE Account 3-002-8844-05 and 3-002-8844-20
- 14** DPSS Gain Program Headquarters
3220 Rosemead Blvd.
El Monte, CA 91731
SCE Account 3-013-9970-42
- 15** Claremont Public Library
208 N. Harvard Avenue
Claremont, CA 91711
SCE Account 3-001-4066-93
- 16** West Covina Public Library
1601 W. West Covina Pkwy
West Covina, CA 91790
SCE Account 3-000-2452-66
- 17** Clifton M. Brakensiek Public Library
9945 E. Flower Street
Bellflower, CA 90706
SCE Account 3-001-4065-82
- 18** North Services Agency – Service Building
31320 N. Castaic Rd.
Castaic, CA 91384
SCE Account 3-001-4069-06

- 19** Rio Hondo Courts Parking Structure
11228 Valley Blvd.
El Monte, CA 91731
SCE Account 3-011-6567-58
- 19A** Montebello Public Library
1550 W. Beverly Blvd.
Montebello, CA 90640
SCE Account 3-001-4065-32
- 20** DPSS South Family
17600 S. Santa Fe Avenue
Compton, CA 90221
SCE Account 3-011-6128-11
- 21** Southwest DPSS
1326 W. Imperial Hwy
Los Angeles, CA 90044
SCE Account 3-012-1919-60
- 22** Downey Administration Center (lighting controls)
9150 E. Imperial Hwy
Downey, CA 90242
SCE Account 3-011-5029-00
- 23** ISD Eastern Avenue Complex
1100 N. Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-000-0599-41
- 24** Sheriff's STAR Center
11515 Colima Rd.
Whittier, CA 90604
SCE Account 3-011-9860-40
- 24A** Los Angeles County Public Works Department
900 South Fremont Avenue
Alhambra, CA 91803
SCE Account
- 25** ISD Parking Lot
1100 N. Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-000-0599-41

- 26.1** ISD Complex Crafts Shop
1102 Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-000-0599-41
- 26.2** ISD Auto Repair Shop
1104 Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-000-0599-41
- 26.3** ISD Warehouse
1110 Eastern Avenue
Los Angeles, CA 90063
SCE Account 3-000-0599-41
- 30** Downey Administration (VFD)
Same As #22 (Lighting Controls)
- 33** Harbor UCLA Medical Center
1000 W. Carson Street
Torrance, CA 90502
SCE Account 3-012-4211-96

EM&V Process

The evaluation measurement and verification process involved four components:

- Verification of equipment existing prior to retrofit and, for control systems, verification of pre-retrofit operation
- Verification of new equipment installation
- Data collection for assessment of operating hours (post-retrofit on all measures and both pre- and post-retrofit on lighting control measures)
- Calculation of energy savings

In addition to the above components that enable us to assess *ex-post* energy savings, the EM&V process also provided the following valuable benefits that increased the energy savings, reliability, and safety of the systems:

- Review of appropriateness of proposed installations
- Discovery of improperly operating equipment
- Recommendations for improved operation for increased savings.

Lighting Measures. Five of the nine “measures” included in the program were standard lighting retrofits: HID fixtures, exit signs, T-8 fluorescents, compact fluorescents, and T-5 fluorescents. Twenty of the site retrofits included one or more of these measures. We visited each site prior to the installation to verify the existing equipment. In addition to verifying fixture quantities, this process included inspection of a sample of fixtures to determine lamp quantities, lamp wattage and types (standard, energy-saver, high-output, etc.) and ballast type (standard magnetic, energy-saving magnetic, or electronic). We were provided copies of the spreadsheets used by the retrofit contractors, verified their inventory, and made occasional adjustments to quantities or wattages as appropriate.

After the installation of the new fixtures, we visited each site a second time. During this visit we verified that the new fixtures were as described in the spreadsheet. We also installed dataloggers on a sample of lighting circuits in order to collect five-minute interval data. After a monitoring period of three to four weeks, the dataloggers were removed. Load profiles were developed from the interval data, and from these load profiles we calculated full-load equivalent operating times.¹ Since no controls were installed on these lights, the measured post-retrofit operating time was assumed to be equivalent to the pre-retrofit operating time.

The contractor’s spreadsheets were modified as needed to recalculate the *ex-post* energy savings of the particular site. Typically these modifications included changing the estimated operating hours of various fixtures or groups of fixtures. This was done on a line-item basis, matching each room or area of the facility with the most representative operating time. In cases where pre- or post-retrofit fixture wattages or quantities were found to be inaccurate on the contractor’s spreadsheet, these values were also changed. Wattages, operating hours, and other values that were changed were highlighted in our printouts of the “Aloha Measured” spreadsheets.

Lighting Controls. At six of the sites, control systems were installed to reduce the operating time of the lights. Some of these sites had no effective control system prior to the installation of the new system, while others had systems that were already working. At each site we collected five-minute interval data from a representative sample of lighting panels or circuits for a three-to-four-week period before the control system was installed. After the system was installed, we returned to the site and collected an additional three or four weeks of post-installation interval data. Load profiles were developed from these data, and pre- and post-installation full-load equivalent operating times were determined. From these values we calculated the annual operating hour reduction (or sometimes increase) resulting from the new control system.

We took true-power readings on all of the lighting panels and circuits, not just those from which we collected load profile data. For situations where we had measured

¹ The “full-load operating time” of the lights is the equivalent period of time the lights would run at full load and consume the same amount of energy they consumed with the recorded load profile. In some instances this is the same as the time when the lights are on because they are either all on or all off. In other cases this amount of time is less than the period of time when *any* light is used because there are times when only a portion of the light are used.

operating hours, the energy savings was determined by multiplying the panel's power demand by the reduction in annual operating hours. For panels where we did not have directly metered operating hour information, we developed an estimate based upon that particular panel's similarity to a metered panel. The energy savings were calculated by multiplying the measured power demand by the estimated operating time reduction.

Time Clocks. New electronically programmable time clocks were installed on the chillers in twenty county libraries. These time clocks are capable of establishing operating schedules that account for holidays and considerable flexibility in the day-to-day operation of the equipment they control. They are replacing either 24-hour or 7-day mechanical time clocks that had previously controlled the chillers.

This project had been delayed until very late in the program, and was then implemented suddenly. We did not have time to collect metered data either before or after the time clocks were installed. However, the total of this measure represents less than 5% of the program's overall energy savings, and metered data on chillers is never as simple to evaluate and extrapolate as that from lighting systems. We made some basic assumptions about the chillers, their operation, and the control systems existing prior to the installation of the new time clocks. We used the software in the utilities' SPC program to estimate the energy consumption of the chillers. We made our estimate independently from that made by county personnel (except for very limited information about the average size of the chillers) and developed an estimate with less than 1% discrepancy from theirs.

VFD Retrofit. Variable-frequency drives were installed on the large air handler blowers of the Downey Administration Building. We took power readings and installed dataloggers both before and after installation of the VFD systems. The VFDs operate in a very discrete manner – full load during work hours and very reduced load during nights and weekends. We were able to calculate pre- and post-VFD energy consumption, and thereby energy savings, through the power and operating time calculations.

Chiller Retrofit. One new 1200-ton chiller was installed in a hospital central plant. It is one of three chillers and replaced one of the older units. The hospital had collected detailed operating information on a daily basis for the past several years. We calculated the energy consumption of the chiller plant based upon the actual operation (recorded in ton-hours of cooling several times during each day) and the part-load efficiency curves provided for the specific chillers. We then determined what the energy use of the new chiller would have been if it had operated exclusively during this three-year period. (The new chiller is set to run as the primary lead chiller and the maximum cooling load did not exceed 1200 tons at any time during the three-year evaluation period.) The energy savings was determined to be the difference between what the old system did use and what the new chiller would have used.

Benefits Achieved by Interactive EM&V

Aloha Systems practices “interactive EM&V.” In the course of our evaluation process, we work directly with the implementer, contractor, and in this particular case, even the equipment manufacturer. Because we are licensed electrical contractors as well as engineers and evaluation professionals, we sometimes even correct problems directly on the site, particularly if they are safety related.

In the LA County program there were two facilities – the Sheriff’s Biscailuz Center and the Monrovia Auto Shop – where lighting retrofits were scheduled and described by the contractor even though the lights were in unused or seldom-used buildings and would result in minimal actual energy savings. We pointed this out the county program manager, and these portions of the facilities were removed from the retrofit plan. This eliminated about 470 lighting fixtures that would have cost the county money but saved little energy. The money saved from eliminating these fixtures enabled the county to use the funds to install fixtures in areas where they would be more likely to save energy.

The air handler VFDs are supposed to operate in reduced-power mode during evenings and all day on Saturday and Sunday. Our metering showed that they reduced speed during the evenings, but that Saturday and Sunday behaved like every other day. We notified the county of this problem and it was corrected. Making this simple correction will save an additional 135,000 kWh per year. Another VFD problem was discovered during our site visit. One of the units was running in reduced power mode during the day and was causing vibrations as well as providing inadequate air supply. Energy Management Division staff were notified and the problem was corrected.

Finally, most of the controls sites were found to be partially inactivated and not optimally programmed. The evaluation work will enable the county’s Energy Management Division staff to determine which areas need the most work, and the report will provide them with useful information for demonstrating to local facility managers and building operators how the improvements could save the county energy and money.

What Constitutes *Ex-Ante*?

The original project as submitted to the CPUC had a total budget of \$6,020,205 and a gross annual savings projection of 12,557,969 kWh. When the CPUC approved the non-utility programs in D.02-05-046, the budget was reduced to \$3,333,333 and the commission required the county to reduce its program goals accordingly. In response to this approval with reduced budget, the county filed its revised program goals on May 24, 2002. The following table is excerpted directly from that filing:

Description	No. Measures	Budget	Savings		
			kWh/Yr	Cost	Savings
HID	760	\$ 262,500	475,800	\$ 47,580	112.50
Exit Light	160	\$ 15,000	59,130	\$ 5,913	6.8
Retrofit T-12	7500	\$ 525,000	1,965,600	\$ 196,560	630.0
Incandescent	100	\$ 24,000	14,664	\$ 1,466	4.7
Bldg Wide Ltg Controls	7 sites	\$ 930,121	1,886,285	\$ 188,629	-
Time Clocks	20	\$ 3,000	261,660	\$ 26,166	-
Variable Freq. Drives	20	\$ 100,000	321,690	\$ 32,169	-
Chillers	1@1200 tons	\$ 1,260,000	1,023,360	\$ 102,336	492.0
Totals =		\$ 3,119,621	6,008,189	\$ 600,819	1,246.0

Based upon comprehensive audits conducted on many of the sites, the county revised its plan and formally applied for a revision. This revision was submitted to the CPUC by Southern California Edison and the county on April 21, 2003, and was approved by Energy Division staff. The following table is taken from Attachment C to that revision application. The revised plan increased the proposed annual savings by approximately 1.2 GWh while maintaining the same overall budget. Much of the increased savings was achieved by the county receiving significantly lower cost bids for installation of the 1200-ton chiller.

REVISED PLAN							
			Quantity of Measures	BUDGET	SAVINGS kWh/YR	ANNUAL COST SAVINGS	ANNUAL kW Savings (Net)
HID*			64	\$22,702	197,100	\$19,710	36.00
EXIT SIGNS			134	\$27,180	48,360	\$4,836	5.00
T-12 TO T-8			7,114	\$598,424	1,228,083	\$122,808	283.00
INCANDESCENT			530	\$29,222	83,663	\$8,366	26.00
BLDG CONTROLS sq ft			2,013,425	\$933,897	2,640,295	\$264,030	N/A
TIME CLOCKS			20	\$2,700	261,600	\$26,160	N/A
VFD RETROFIT			8	\$166,751	947,661	\$94,766	N/A
CHILLER RETROFIT			1	\$560,591	954,267	\$95,427	339.00
*NEW ADDITIONAL MEASURE (SUBSTITUTE FOR HID RETROFIT)							
INSTALLATION OF T-5			970	\$466,191	806,187	\$80,619	177.00
Subcontractors Administration Costs				\$311,962			
TOTAL				\$3,119,620	7,167,216	\$716,722	866.00

The spreadsheet accompanying the original program submittal had the original total kWh savings for each measure entered directly the per-unit savings category ("Program Activities Worksheet" Column F) and "1" inserted in the "Program Unit

Goals” column (K).² The revised spreadsheet submitted with the April 2003 modification corrected this technical problem by entering the quantities listed in the table immediately above in Column K and the appropriate per-unit savings in Column F to cause the total to match the table above. The following table presents these per-unit values.

Ex-Ante Per Unit Values			
Measure	Total kWh/yr	Units Proposed	kWh/yr per Unit
HID	197,100	64 Fixtures	3,079.69
Exit Light	48,360	134 Fixtures	360.90
Retrofit T-12	1,228,083	7114 Fixtures	172.63
Incandescent	83,663	530 CFLs	157.85
Bldg Wide Ltg Controls	2,640,295	2,013,425 sq feet	1.31134
Time Clocks	261,600	20 Time Clocks	13,080.00
Variable Freq. Drives	947,661	8 Drives	118,4557.63
Chillers	954,267	1 1200-ton	954,267.00
T-5 Lights	806,187	970 Fixtures	831.12
Total	7,167,216		

The *ex-ante* concept of measurement accepts the per-unit value as a “stipulated” average value and verifies that the quantities of measures were actually installed. The actual savings achieved by these measures is determined by the *ex-post* measurement and verification.

The formal program application with the CPUC does not delineate installation sites. The total county-wide quantities are listed for various types of measures, but there is no technical requirement that they be installed in particular sites. However, our evaluation work occurred on a site-by-site basis, and the *ex-ante* and *ex-post* numbers are reported for specific sites.

The *ex-ante* per-unit values, particularly for the direct lighting fixture replacement measures, are based upon county-wide averages. On a site-by-site basis, there may be significant discrepancy between the reported *ex-ante* savings (based solely upon the actual number of fixtures retrofitted and the average kWh and kW savings), the contractor’s and county’s estimates (based upon specific fixtures and their assumed operating hours) and our *ex-post* savings estimates (based upon the specific fixtures and their actual operating hours). For the program totals the county’s estimate and the *ex-ante* savings are similar because the average per-unit savings underlying the *ex-ante* savings calculations come from the same ultimate source.

By the very nature, *ex-ante* savings calculations verify that the program implementer did what it contracted to do, but do not verify that the energy savings

² The exit light savings on the spreadsheet was entered as 69,130 kWh, making the total 6,018,189 kWh. We interpret this as a typographical error and will use the 59,130 value in the formal filing document.

purported to be achieved by that accomplishment actually represent the true energy savings. That is the object of the *ex-post* estimate.

Ex-Ante Savings Calculations

Official program evaluation is based upon *ex-ante* savings calculations. In the program approval process, per-unit energy savings and demand reduction figures are provided for each component energy efficiency measure of the program. The *ex-ante* savings are then determined by multiplying the actual number of units provided through the program by their respective per-unit savings estimates.

Ex-Ante Savings Calculations				
Measure	Proposed Units	Proposed kWh/yr	Units Installed	Ex-Ante kWh/yr
HID Fixtures	64	197,100	88	271,012
Exit Light Fixtures	134	48,360	149	53,772
Retrofit T-12 Fixt	7,114	1,228,083	7,231	1,248,286
Incandescent to CFL	530	83,663	590	93,131
Ltg Controls Sq Ft.	2,013,425	2,640,295	2,013,425	2,640,295
Time Clocks	20	261,600	20	261,600
Variable Freq. Drive	8	947,661	8	947,661
Chillers (1200T)	1	954,267	1	954,267
T-5 Light Fixtures	970	806,187	984	817,822
Total		7,167,216		7,287,846

The program clearly met its goals. In each category of lighting retrofit, a few more fixtures were actually installed than had been planned originally. For this reason the *ex-ante* savings evaluation is slightly more (101.7%) than the revised program goals.

Furthermore, because the program design was improved and revised during its implementation, the *ex-ante* savings is actually significantly higher (121%) than the original program savings estimate – 6,008,189 kWh/year – the savings estimate upon which the CPUC approved the program for funding.

Savings of Individual Sites

For practical reasons, the detailed discussions of the program and its energy savings calculations are presented on a site-by-site basis, even though the program was not specifically approved only for certain sites. The sites are grouped by type of measure, though the first sites often included more than one of the lighting “measures.”

We measured and verified 100% of the installation sites. The following table provides a detailed listing of each site along with the contractor’s savings estimate, the site’s *ex-ante* savings estimate and its *ex-post* savings estimate. The *ex-ante* savings estimates are simply based upon the number of fixtures and the stipulated per-unit savings in the program spreadsheet submitted to the CPUC. The *ex-post* savings estimates are derived from our metering. Their calculation is detailed in the chapters discussing each individual campus. General discussion by measure type follows immediately in this chapter.

Individual Site Annual Energy Savings Estimates					
Site No.	Location	LA County Preliminary Savings (kWh)	Contractor As-Built Savings (kWh)	<i>Ex-Ante</i> CPUC Spreadsheet Savings (kWh)	Aloha Measured Savings (kWh)
1	DA Warehouse	61,082	62,698	94,567	68,897
2	Warm Springs Rehabilitation	43,224	43,157	55,762	35,026
3	Bellflower Parking	14,507	14,577	35,907	52,717
4	Superior Court Warehouse	13,431	13,571	44,163	14,030
5	Willowbrook Senior Center	25,124	32,470	44,650	27,507
6	Willowbrook Child Care	17,803	21,364	29,021	27,642
7	DCSS Florence/ Firestone	39,012	37,992	47,086	50,710
8	ISD Dist 3 Facilities	55,763	56,525	52,978	98,475
9	Sheriff Field Operations II	148,359	51,187	43,320	68,759
10	Monrovia Auto Shop	45,625	44,084	56,692	39,086
11	Sheriff Comm Center	235,718	208,765	133,636	169,584
12	Biscailuz Center	143,893	125,300	139,586	209,722
13	Animal Control #6	17,929	35,817	76,382	39,186
14	DPSS GAIN	68,441	67,953	79,773	65,840
15	Claremont Library	56,709	61,233	82,776	60,078

Individual Site Annual Energy Savings Estimates					
Site No.	Location	LA County Preliminary Savings (kWh)	Contractor As-Built Savings (kWh)	Ex-Ante CPUC Spreadsheet Savings (kWh)	Aloha Measured Savings (kWh)
16	West Covina Library	155,360	156,922	139,801	153,753
17	Brakensiek Library	95,411	94,726	99,387	70,957
18	North Services Agency	102,038	124,480	55,656	100,133
19	Rio Hondo Parking	20,678	22,641	21,820	37,126
19A	Montebello Library	0	96,551	128,556	94,076
25	ISD Parking	197,100	178,941	203,260	178,841
26	ISD HID-to-T5	806,187	531,455	817,822	811,932
LTG	Lighting Retrofit Total	2,363,394	2,082,409	2,484,023	2,474,077
20	DPSS South Family	174,409		174,409	19,604 (a)
21	Southwest DPSS	201,811		201,811	290,535 (b)
22	Downey Administration	468,599		468,599	325,201 (c)
23	ISD 1100 Complex	733,301		733,301	28,191 (d)
24	Sheriff's STAR Center	359,074		359,074	32,241 (e)
24A	Public Works	703,101		703,101	80,999 (f)
CONT	Lighting Controls Total	2,640,295		2,640,295	776,771*
TC	Library Chiller Time Clocks	261,600		261,600	261,366
VFD	Downey Admin VFDs	947,661		947,661	851,687
CHLR	Harbor Med Chiller Retrofit	954,267		954,267	1,356,177
Total		7,167,217		7,287,846	5,720,078
Total	Potential				6,522,474*

- (a) The South Family savings will become 30,163 if the units are optimized as discussed in the site chapter.
- (b) The Southwest DPSS savings will become 527,827 if the units are fully programmed to their proposed schedule.
- (c) The Downey Admin savings will become 561,697 if the units are fully programmed to their proposed schedule.
- (d) The Eastern Avenue complex will become 197,936 if the units are optimized as discussed in the site chapter.
- (e) The STAR Center savings will become 49,524 if the units are optimized as discussed in the site chapter.
- (f) The Public Works building savings will become 212,020 if the units are fully programmed to their proposed schedule.

*If all of these control system optimizations take place, the *ex-post* control savings could be 1,579,167 kWh/yr and the program total could be 6,522,474 kWh/yr.

Ex-Post Savings Calculations

Ex-post savings calculations provide a truer picture of the actual savings that will be achieved by the program. In addition to assessing whether the energy-efficiency measures specified in the plan were actually installed, the *ex-post* savings estimates verify and correct the assumptions made to estimate the program's potential prior to its installation.

The overall *ex-post* savings of this program were not as robust as the *ex-ante* estimates. We note, however, that this is true only because of the inability of the lighting control systems to save energy. Furthermore, we note that the only reason that all these new systems do not save energy is because some of them were installed in locations where controls and/or personnel were doing an adequate job of proper lighting operation.

The total *ex-post* energy savings is 5,720,078 kWh per year, or 79% of the revised program goal and 91% of the original program goal. If aggressive programming of the new control systems is actually accomplished, the *ex-post* savings could reach 6,522,474 kWh per year, which is 91% of the revised program goal and 109% of the original program goal. Since the county is still working to fully program the control systems, a final result somewhere between these two values will probably be achieved.

Discussion of Measures and Success

Lighting Retrofits. These measures were found to actually save very close to the amount of energy originally assumed. This is particularly true when the entire set of facilities is considered, since some individual facilities saved less than assumed while others saved more. Generally it was discrepancies in assumed and measured operating hours that resulted in the divergence. When the five lighting measures (#1-#4 and new measure #9) are combined together, the comparison is extremely close:

Five Lighting Retrofit Measure Savings Estimates		
Estimate	Value	Percent of Proposal
LA County Proposal	2,363,394	100.0%
Contractor's As-Built	2,082,409	88.1%
Aloha Ex-Ante	2,484,023	105.1%
Aloha Ex-Post	2,474,077	104.7%

The comparison is even more remarkable when one considers that the majority of the discrepancy in the contractor's estimates was caused by a serious spreadsheet error in one site (#26, the T-5 lights at Eastern Avenue).

Lighting Controls. The lighting controls were the one measure in this program that did not save nearly as much energy as predicted. This is not because the controls did not work, but rather because the pre-existing systems adequately controlled the lights. In some cases the previous controls actually did a better job than the new control system. The individual site savings varied widely, depending on the nature of the previous control system. In buildings like the Downey Administration Center (#22) and the Southwest DPSS facility (#21), where many of the lights operated continuously, significant savings were achieved. In others, savings were trivial.

These systems were installed in early 2004 and, even after physical installation, were not fully programmed. Our metered *ex-post* calculations reflected a preliminary situation in which the controls had been installed but were not optimized. The "potential ex-post savings" listed in the table represents a savings that we believe could be achieved if the control systems were aggressively programmed toward their optimal capability. Even under this ideal situation, however, the savings will be only 60% of what was originally predicted because the prior operation of the sites was not as wasteful as had been assumed. (We should not lose sight of the fact that this is a "good thing" and makes a positive statement about the county's facilities and the behavior of county employees at these offices, even though it appears with a negative tone in not reaching predicted savings estimates.)

Lighting Control Systems Savings Estimates		
Estimate	Value	Percent of Proposal
LA County Proposal	2,640,295	100.0%
Aloha <i>Ex-Ante</i>	2,640,295	100.0%
Aloha <i>Ex-Post</i>	776,771	29.4%
Potential <i>Ex-Post</i>	1,579,167	59.8%

Timeclocks on Chillers. The detailed site information about these installations was not available, and they were evaluated as a conglomerate. The timers were installed on the chillers of twenty libraries located within the Los Angeles Area, though the exact sizes and models of the chillers were not known. We developed an estimation methodology that was reasonable. The result of our estimate, 261,366 kWh per year, was within 0.1% of the county’s own estimate, even though we did not review their methodology and used only very basic assumptions in common. We believe that this somewhat surprising closeness of estimates tends to validate both of them.

These timeclocks are easy to install and do not require modification of the chillers themselves. Even though their savings account for only a small portion of chiller energy use, the measures are worthwhile.

Variable-Frequency Drives. The measured energy savings is 90% of the predicted value. Minor adjustments to the operation schedule could easily bring this savings up to or even slightly above the predicted value. The VFDs were installed on air handlers that are required to run continuously to supply fresh air to the building. However, they are not required to run at full speed except when the building is occupied by significant numbers of employees. Reducing the load during nights and weekends enable air quality standards to be met while reducing energy consumption by a considerable value.

High-Efficiency Chiller. The chiller at the Harbor Medical Center replaced an older, less efficient chiller of the same size. It was also set to run as the sole lead chiller, with the other units being used only as back-up. This enabled substantial energy savings. Our calculation, based upon the three-year period of 2000 to 2002, was 142% of the savings estimated by the county for this application. Furthermore, the bids received by the county for the chiller were significantly less than originally estimated. This extra money being available was one of the primary means by which the county could add more sites and measures.

Customer Satisfaction Survey

The program was sponsored and coordinated by the Internal Services Department of the county government. The “customers” are the facilities managers and other county employees occupying the individual sites in which the measures were installed. We conducted a brief survey of the local facility staff and asked them to rate the program and the equipment.

Six county agencies submitted responses. The respondents were asked to assign a value from 1 to 5 to each of the following, with 5 being “excellent” and 1 being “poor.” The following table presents the average values:

Color quality of the <i>old</i> lighting system before retrofit	2.5
Color quality of the <i>new</i> lighting system after retrofit	4.3
Lighting levels of the <i>old</i> system before retrofit	2.3
Lighting levels of the <i>new</i> system after retrofit	4.3
Installation contractor’s work and professionalism	4.3
General overall satisfaction with the project	4.3

In general the respondents felt that the new lighting systems provided much better light, both with respect to light levels and color quality. No respondent was dissatisfied with the new lights, and no one ranked the new lights with a lower ranking than the old lights. Rankings for the new lights were either 4 or 5. Rankings for the old lights ranged from 1 to 4.

None of the respondents indicated overall dissatisfaction with either the installation contractors or the general project.

Net-to-Gross Ratio

This program was submitted using the default 0.8 net-to-gross ratio of energy savings. We believe there is substantial argument for using a net-to-gross ratio of 1.0. Los Angeles County has a vast array of facilities and a somewhat limited budget for energy-efficiency improvements. There are many more facilities for which similar measures could be installed, and similar savings achieved, but these projects are not undertaken simply because of funding. The projects that made up this program – the specific sites and installations discussed in this report – were completed only because of the PGC-funded money being available.

It is true that one cannot categorically state that any given site in this project would not have received the same energy efficiency improvements through another program had this particular program not been funded. However, the proper way to look

at that situation is simply as a transfer of funds from one site to another. Assume, for example, that the county has \$5M of its own money to spend on conservation plus an additional \$3M from PGC funds. This makes a total of \$8M of conservation that is accomplished, yet the total pool of beneficial conservation projects may total \$20M or more.³ While a portion of the \$5M may have been used for one of these sites, that simply would have meant that one of the sites not covered under this PGC-funded program would have not received its benefits.

We have seen vast quantities of the stock of facilities of Los Angeles County. For any practical amount of project funding, they can be considered a limitless supply of conservation opportunity, and any realistic amount of money from county taxpayers and/or utility ratepayers could be used for cost-effective conservation – conservation that would not be achieved unless those moneys were made available. This is why we believe the true net-to-gross ratio of this program is 1.0, not 0.8.

Conclusions

- The county installed at least as many, and in some cases slightly more, measures than proposed.
- The *ex-ante* savings is 102% of the revised proposed savings and 121% of the originally contracted savings estimate.
- Metered *ex-post* savings for the lighting retrofits and high-efficiency chiller installations exceeded the proposed savings.
- Metered *ex-post* savings for the chiller timeclocks and air handler variable-frequency drives were approximately the same as the proposed savings.
- The lighting control systems were the only systems that did not save the anticipated amount of energy. This was not because the systems did not work, but because they were installed in locations where energy conservation was already taking place.
- The lighting retrofits improved both lighting levels and lighting quality, resulting in increased customer satisfaction concurrently with saving energy.
- This program was clearly a beneficial use of public funds and should be repeated into the future until the point at which the potential for increased energy efficiency at county facilities is exhausted; therefore we believe funding should be continued for several years.
- Other counties within California would presumably benefit from similar programs; their implementation would provide a double benefit to the citizens by decreasing our state's energy consumption and reducing local government costs.

³ These numbers are simply used as examples and are not meant to represent the county's actual situation in any manner.

Site Measurement and Verification Report

Site Number 1

District Attorney Warehouse

5300 Harbor Street, Commerce

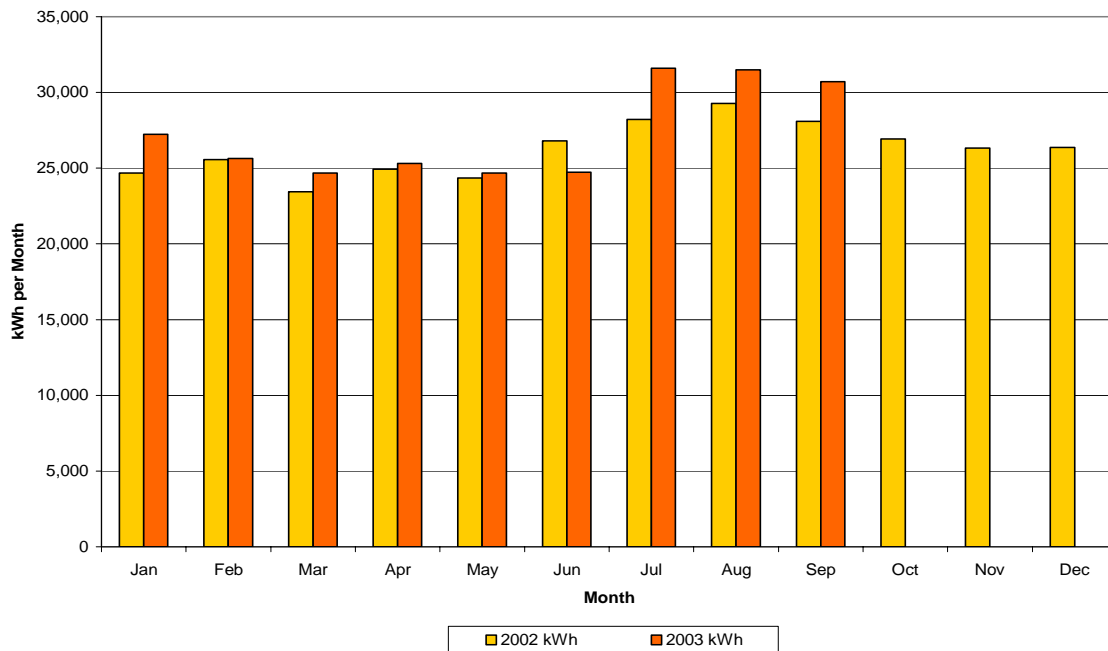
SCE Account 3-018-5645-68 and 3-018-5646-01

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	61,082 kWh
Contractor's As-Built Estimate	62,698 kWh
<i>Ex-Ante</i> Evaluation	94,567 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	68,897 kWh

Site Description

This facility consists of a single story office section connected to a storage warehouse. The office section consists of a several open office areas, a few smaller offices, a break room, and rest rooms. The facility, including the warehouse storage area, is operational Monday-Friday from 6:30 a.m. to 5:00 p.m. Southern California Edison supplies the facility at 240 volts single phase through meter 843-000105. Its annual energy consumption in 2002 was 314,920 kWh, and its peak demand was 80 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

District Attorney Warehouse



Preliminary Site Visit

The site was visited on April 22, 2003. During the visit existing lighting was observed we found all 2x4 troffers are either 3-lamp or 4-lamp T12 fixtures. The front lobby has compact fluorescent lamps in the overhead fixtures. During the walk through most areas had all their fixtures turned on. All of the ballasts inspected are magnetic, "energy saver" type. The fluorescent lamps are 34W bulbs for the office areas and 60W energy saver lamps in the warehouse. In general, the preliminary fixture counts are reasonable.

The preliminary contractor spreadsheet contained a mismatch of quantities with their appropriate fixtures. This problem had been resolved by the time of the pre-retrofit audit.

Post-Retrofit Audit

The site was again visited on December 30, 2003. The retrofits were verified by means of a general walk through and inspection and no post-retrofit discrepancies were noted.

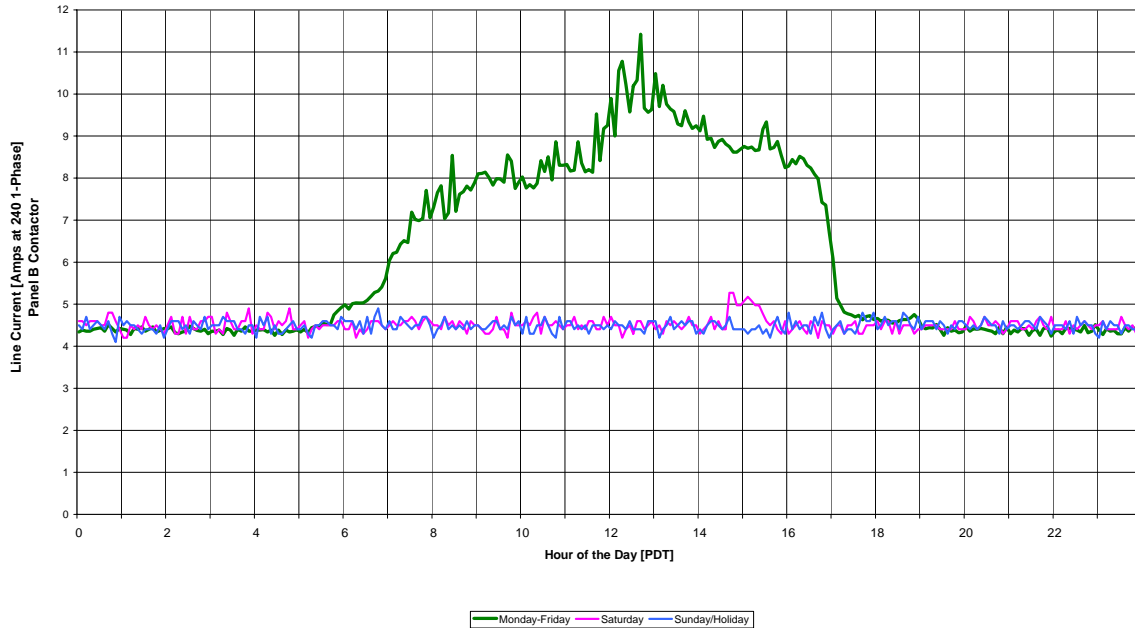
One spreadsheet discrepancy remained. The open area office was reported as having 20 two-lamp fixtures and 4 four-lamp fixtures. In fact it was the opposite. This correction was made on the spreadsheet and highlighted in lavender.

Metered Load Profiles

In order to verify operating hours of the facility a lighting load of about 30 fixtures was monitored in the warehouse area. The logger was placed on the contactor feed to Panel B. The load profile indicates a variable load during the day with continuously operating lights at night, presumably by controlling the lights at individual switches or circuit breakers. The general operating pattern of this load profile is consistent with the stated operating hours of the warehouse, which opens at 6:30 a.m. and closes at 5:30 p.m. The resulting 4,027 equivalent hours per year will be assigned to all fixtures other than the main bank of warehouse lights. It demonstrates an average of loads ranging from continuous to seldom-used.

The main warehouse lights are controlled by a separate, larger contactor, which was inaccessible for monitoring. For those lights we will assume an 11-hour per weekday operating period, amounting to 2,761 hours per year (11 x 251).

LA County D.A. Warehouse Jan. 2004
Warehouse Lights
Average Daily Load Profile



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not highlighted. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

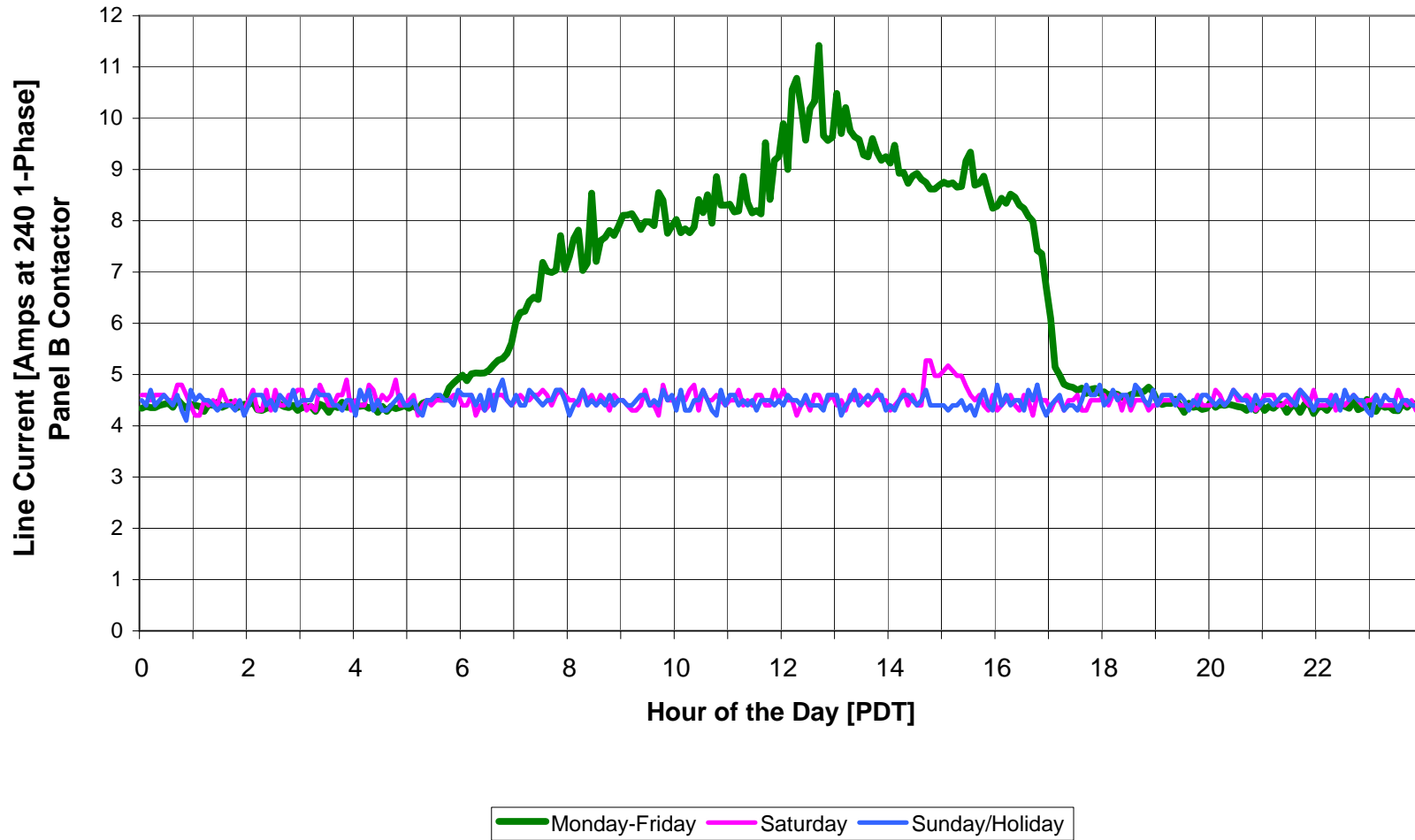
District Attorney Warehouse Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	538	60,865	535	61,195	92,357	66,540
Inc to CFL	17	217	14	1,503	2,210	2,357
Total	555	61,082	549	62,698	94,567	68,897

The official *ex-ante* savings estimate for this site is higher than either the proposed, as-built, or *ex-post* estimates because most of the fixtures in this site were old 8-foot two-lamp fixtures replaced by 4-foot four-lamp fixtures with a 35-watt reduction per fixture, while the average savings for T12 to T8 change was 40 watts, and the lights did not operate quite as long as the system-wide 4,340 hour average. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county's proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

Our *ex-post* measurement of savings is slightly higher than either the county's original assumption or the contractor's as-built estimate because of slightly longer equivalent operating hours resulting from the emergency lights.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

LA County D.A. Warehouse Jan. 2004
Warehouse Lights
Average Daily Load Profile



Contractor As-Built Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
45	EXTERIOR	MV100/1	WP100MV1	1	WALL PACK	0	125	0.00	4368	0	TC	NO CHANGE	MV100/1		1	Z	0	125	0.000	0	0.00	0	
																Total HID	0				0.00	0	
1	LOBBY	F42EE	S34CF2	2	OPEN STRIP	6	72	0.43	3120	1,348		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	842	0.16	505	
2	LOBBY	F22SS	S20CR2	2	OPEN STRIP	8	56	0.45	3120	1,398		RETROFIT	F22ILL-R		2	LBO	8	29	0.230	719	0.22	679	
4	HALL	FU2EE	T40RFU2	2	TROFFER	2	72	0.14	3120	449	S	RETROFIT	FU2ILL-R		2	LBO	2	52	0.104	324	0.04	125	
5	OFFICE	FU2EE	T40RFU2	2	TROFFER	1	72	0.07	2600	187		RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	135	0.02	52	
6	OFFICE	F44EE	T34RF4	4	TROFFER	1	144	0.14	2600	374	S	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	229	0.06	146	
7	OFFICE	FU2EE	T40RFU2	2	TROFFER	2	72	0.14	2600	374		RETROFIT	FU2ILL-R		2	LBO	2	52	0.104	270	0.04	104	
8	COPY	FU2EE	T40RFU2	2	TROFFER	2	72	0.14	2080	300	S	RETROFIT	FU2ILL-R		2	LBO	2	52	0.104	216	0.04	83	
9	STORAGE	FU2EE	T40RFU2	2	TROFFER	1	72	0.07	520	37		RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	27	0.02	10	
10	OFFICE - HALL	F42EE	W34CF2	2	WRAP	1	72	0.07	2600	187	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	117	0.03	70	
11	OFFICE-RR	F42EE	W34CF2	2	WRAP	1	72	0.07	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.03	14	

Contractor As-Built Savings
01. District Attorney Warehouse

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
15	OFFICE	F44EE	T34RF4	4	TROFFER	4	144	0.58	2600	1,498	S	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	915	0.22	582
16	OFFICE-AA3	F44EE	T34RF4	4	TROFFER	4	144	0.58	2600	1,498	S	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	915	0.22	582
17	OPEN OFFICE	F44EE	T34RF4	4	TROFFER	4	144	0.58	3120	1,797	2S	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,098	0.22	699
18	OPEN OFFICE	F42EE	W34CF2	2	WRAP	20	72	1.44	3120	4,493		RETROFIT	F42ILL-R(G3)		2	LBO	20	45	0.900	2,808	0.54	1,685
19	HALL	F43EE	T34RF3	3	TROFFER	5	115	0.58	3120	1,794	S	RETROFIT	F43ILL-R(G3)		3	LBO	5	66	0.330	1,030	0.25	764
20	OFFICE AA15	F43EE	T34RF3	3	TROFFER	6	115	0.69	2600	1,794	2S	RETROFIT	F43ILL-R(G3)		3	LBO	6	66	0.396	1,030	0.29	764
21	OPEN OFFICE	F48EE	W34CF8	8	WRAP	8	288	2.30	3120	7,188	2S	RETROFIT	F48ILL-R(G3)		8	LBO-2	8	176	1.408	4,393	0.90	2,796
22	OPEN OFFICE	F44EE	W34CF4	4	WRAP	2	144	0.29	3120	899	S	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	549	0.11	349
23	ELECTRICAL	F42EE	S34CF2	2	OPEN STRIP	1	72	0.07	520	37	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.03	14
24	EVIDENCE STORAGE	F43EE	T34RF3	3	TROFFER	2	115	0.23	2600	598	2S	RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	343	0.10	255
25	OPEN OFFICE	F48EE	W34CF8	8	WRAP	4	288	1.15	3120	3,594		RETROFIT	F48ILL-R(G3)		8	LBO-2	4	176	0.704	2,196	0.45	1,398
26	OPEN OFFICE	F44EE	W34CF4	4	WRAP	2	144	0.29	3120	899	2S	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	549	0.11	349
27	KITCHEN	F44EE	T34RF4	4	TROFFER	5	144	0.72	3120	2,246		RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	1,373	0.28	874

Contractor As-Built Savings
01. District Attorney Warehouse

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
28	OFFICE	F43EE	T34RF3	3	TROFFER	5	115	0.58	2600	1,495	S	RETROFIT	F43ILL-R(G3)		3	LBO	5	66	0.330	858	0.25	637
29	OFFICE	F44EE	T34RF4	4	TROFFER	2	144	0.29	2600	749		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	458	0.11	291
30	FOYER	F42EE	W34CF2	2	WRAP	1	72	0.07	2080	150		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	94	0.03	56
31	MENS RR	F42EE	W34CF2	2	WRAP	3	72	0.22	2080	449		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	281	0.08	168
32	OFFICE	F44EE	T34RF4	4	TROFFER	5	144	0.72	2600	1,872	S	RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	1,144	0.28	728
34	WAREHOUSE MENS	F82EE	W96CF2	2	WRAP	1	123	0.12	2080	256	S	FIT KIT	F44ILL-R(G3)		4	FIT KIT	1	88	0.088	183	0.04	73
35	WAREHOUSE WOMEN	F82EE	W96CF2	2	WRAP	1	123	0.12	2080	256	S	FIT KIT	F44ILL-R(G3)		4	FIT KIT	1	88	0.088	183	0.04	73
36	WAREHOUSE WOMEN	F42EE	W34CF2	2	WRAP	1	72	0.07	2080	150	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	94	0.03	56
37	COMPUTER ROOM	F42EE	W34CF2	2	WRAP	2	72	0.14	520	75	S	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.05	28
38	WAREHOUSE OFFICE	F42EE	W34CF2	2	WRAP	3	72	0.22	2600	562	S	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	351	0.08	211
39	WAREHOUSE OFFICE	F44EE	B34CF4	4	SURFACE BOX	6	144	0.86	2600	2,246		RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	1,373	0.34	874
40	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	4	123	0.49	3120	1,535	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	4	88	0.352	1,098	0.14	437
41	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	22	123	2.71	3120	8,443	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	22	88	1.936	6,040	0.77	2,402

Contractor As-Built Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
42	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	15	123	1.85	3120	5,756	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	15	88	1.320	4,118	0.53	1,638	
43	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	371	123	45.63	3120	142,375	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	371	88	32.648	101,862	12.99	40,513	
44	WAREHOUSE	F82EE	I96CF2	2	INDUSTRIAL HOOD	1	123	0.12	3120	384	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	1	88	0.088	275	0.04	109	
																Total T12-T8	535				20.14	61,195	
3	LOBBY	I75/1	C75RI1/6"	1	RECESSED CAN	2	75	0.15	3120	468		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	125	0.11	343	
12	OFFICE CLOSET	I100/1	K100C11	1	KEYLESS	1	100	0.10	520	52		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.08	42	
13	OFFICE SHOWER	I75/1	C75C11	1	RECESSED CAN	1	75	0.08	520	39		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.06	29	
14	VANITY	I40/4	Van40C14	4	VANITY	1	80	0.08	520	42		NO CHANGE	I40/4		4	Z	1	80	0.080	42	0.00	0	
33	STORAGE	I100/1	K100C11	1	KEYLESS	1	100	0.10	520	52	S	RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.08	42	
46	EXTERIOR	I50/1	C50RI1/6"	1	RECESSED CAN	8	50	0.40	4368	1,747	TC	RETROFIT	CFQ15/1		1	TCP CFSI	8	20	0.160	699	0.24	1,048	
47	EXTERIOR	CFQ26/1	WP26WF1	1	WALL PACK	0	33	0.00	4368	0	TC	NO CHANGE	CFQ26/1		1	Z	0	33	0.000	0	0.00	0	
48	EXTERIOR	I300/1	FL300K11	1	FLOOD	0	300	0.00	4368	0	TC/PC	NO CHANGE	I300/1		1	Z	0	300	0.000	0	0.00	0	

Contractor As-Built Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures					Savings						
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
																Total INCAN	14				0.57	1,503	
Total						549		66.35			202,179	Total						549		45.641	139,481	21	62,698

Aloha Systems Measured Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
45	EXTERIOR	MV100/1	WP100MV1	1	WALL PACK	0	125	0.000	4368	0	TC	NO CHANGE	MV100/1		1	Z	0	125	0.000	0	0.00	0	
																Total HID	0				0.00	0	
1	LOBBY	F42EE	S34CF2	2	OPEN STRIP	6	72	0.432	4027	1,740		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,087	0.16	652	
2	LOBBY	F22SS	S20CR2	2	OPEN STRIP	8	56	0.448	4027	1,804		RETROFIT	F22ILL-R		2	LBO	8	29	0.230	928	0.22	876	
4	HALL	FU2EE	T40RFU2	2	TROFFER	2	72	0.144	4027	580	S	RETROFIT	FU2ILL-R		2	LBO	2	52	0.104	419	0.04	161	
5	OFFICE	FU2EE	T40RFU2	2	TROFFER	1	72	0.072	4027	290		RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	209	0.02	81	
6	OFFICE	F44EE	T34RF4	4	TROFFER	1	144	0.144	4027	580	S	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	354	0.06	226	
7	OFFICE	FU2EE	T40RFU2	2	TROFFER	2	72	0.144	4027	580		RETROFIT	FU2ILL-R		2	LBO	2	52	0.104	419	0.04	161	
8	COPY	FU2EE	T40RFU2	2	TROFFER	2	72	0.144	4027	580	S	RETROFIT	FU2ILL-R		2	LBO	2	52	0.104	419	0.04	161	
9	STORAGE	FU2EE	T40RFU2	2	TROFFER	1	72	0.072	4027	290		RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	209	0.02	81	
10	OFFICE - HALL	F42EE	W34CF2	2	WRAP	1	72	0.072	4027	290	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.03	109	
11	OFFICE-RR	F42EE	W34CF2	2	WRAP	1	72	0.072	4027	290		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.03	109	

Aloha Systems Measured Savings
01. District Attorney Warehouse

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
15	OFFICE	F44EE	T34RF4	4	TROFFER	4	144	0.576	4027	2,320	S	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,418	0.22	902
16	OFFICE-AA3	F44EE	T34RF4	4	TROFFER	4	144	0.576	4027	2,320	S	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,418	0.22	902
17	OPEN OFFICE	F44EE	T34RF4	4	TROFFER	20	144	2.880	4027	11,598	2S	RETROFIT	F44ILL-R(G3)		4	LBO	20	88	1.760	7,088	1.12	4,510
18	OPEN OFFICE	F42EE	W34CF2	2	WRAP	4	72	0.288	4027	1,160		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	725	0.11	435
19	HALL	F43EE	T34RF3	3	TROFFER	5	115	0.575	4027	2,316	S	RETROFIT	F43ILL-R(G3)		3	LBO	5	66	0.330	1,329	0.25	987
20	OFFICE AA15	F43EE	T34RF3	3	TROFFER	6	115	0.690	4027	2,779	2S	RETROFIT	F43ILL-R(G3)		3	LBO	6	66	0.396	1,595	0.29	1,184
21	OPEN OFFICE	F48EE	W34CF8	8	WRAP	8	288	2.304	4027	9,278	2S	RETROFIT	F48ILL-R(G3)		8	LBO-2	8	176	1.408	5,670	0.90	3,608
22	OPEN OFFICE	F44EE	W34CF4	4	WRAP	2	144	0.288	4027	1,160	S	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	709	0.11	451
23	ELECTRICAL	F42EE	S34CF2	2	OPEN STRIP	1	72	0.072	4027	290	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.03	109
24	EVIDENCE STORAGE	F43EE	T34RF3	3	TROFFER	2	115	0.230	4027	926	2S	RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	532	0.10	395
25	OPEN OFFICE	F48EE	W34CF8	8	WRAP	4	288	1.152	4027	4,639		RETROFIT	F48ILL-R(G3)		8	LBO-2	4	176	0.704	2,835	0.45	1,804
26	OPEN OFFICE	F44EE	W34CF4	4	WRAP	2	144	0.288	4027	1,160	2S	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	709	0.11	451
27	KITCHEN	F44EE	T34RF4	4	TROFFER	5	144	0.720	4027	2,899		RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	1,772	0.28	1,128

Aloha Systems Measured Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
28	OFFICE	F43EE	T34RF3	3	TROFFER	5	115	0.575	4027	2,316	S	RETROFIT	F43ILL-R(G3)		3	LBO	5	66	0.330	1,329	0.25	987	
29	OFFICE	F44EE	T34RF4	4	TROFFER	2	144	0.288	4027	1,160		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	709	0.11	451	
30	FOYER	F42EE	W34CF2	2	WRAP	1	72	0.072	4027	290		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.03	109	
31	MENS RR	F42EE	W34CF2	2	WRAP	3	72	0.216	4027	870		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	544	0.08	326	
32	OFFICE	F44EE	T34RF4	4	TROFFER	5	144	0.720	4027	2,899	S	RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	1,772	0.28	1,128	
34	WAREHOUSE MENS	F82EE	W96CF2	2	WRAP	1	123	0.123	4027	495	S	FIT KIT	F44ILL-R(G3)		4	FIT KIT	1	88	0.088	354	0.04	141	
35	WAREHOUSE WOMEN	F82EE	W96CF2	2	WRAP	1	123	0.123	4027	495	S	FIT KIT	F44ILL-R(G3)		4	FIT KIT	1	88	0.088	354	0.04	141	
36	WAREHOUSE WOMEN	F42EE	W34CF2	2	WRAP	1	72	0.072	4027	290	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.03	109	
37	COMPUTER ROOM	F42EE	W34CF2	2	WRAP	2	72	0.144	4027	580	S	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	362	0.05	217	
38	WAREHOUSE OFFICE	F42EE	W34CF2	2	WRAP	3	72	0.216	4027	870	S	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	544	0.08	326	
39	WAREHOUSE OFFICE	F44EE	B34CF4	4	SURFACE BOX	6	144	0.864	4027	3,479		RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	2,126	0.34	1,353	
40	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	4	123	0.492	4027	1,981	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	4	88	0.352	1,418	0.14	564	
41	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	22	123	2.706	4027	10,897	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	22	88	1.936	7,796	0.77	3,101	

Aloha Systems Measured Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
42	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	15	123	1.845	4027	7,430	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	15	88	1.320	5,316	0.53	2,114	
43	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	371	123	45.633	2761	125,993	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	371	88	32.648	90,141	12.99	35,852	
44	WAREHOUSE	F82EE	I96CF2	2	INDUSTRIAL HOOD	1	123	0.123	4027	495	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	1	88	0.088	354	0.04	141	
																Total T12-T8	535				20.61	66,540	
3	LOBBY	I75/1	C75R11/6"	1	RECESSED CAN	2	75	0.150	4027	604		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	161	0.11	443	
12	OFFICE CLOSET	I100/1	K100C11	1	KEYLESS	1	100	0.100	4027	403		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	81	0.08	322	
13	OFFICE SHOWER	I75/1	C75C11	1	RECESSED CAN	1	75	0.075	4027	302		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	81	0.06	221	
14	VANITY	I40/4	Van40C14	4	VANITY	1	80	0.080	4027	322		NO CHANGE	I40/4		4	Z	1	80	0.080	322	0.00	0	
33	STORAGE	I100/1	K100C11	1	KEYLESS	1	100	0.100	4027	403	S	RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	81	0.08	322	
46	EXTERIOR	I50/1	C50R11/6"	1	RECESSED CAN	8	50	0.400	4368	1,747	TC	RETROFIT	CFQ15/1		1	TCP CFSI	8	20	0.160	699	0.24	1,048	
47	EXTERIOR	CFQ26/1	WP26WF1	1	WALL PACK	0	33	0.000	4368	0	TC	NO CHANGE	CFQ26/1		1	Z	0	33	0.000	0	0.00	0	
48	EXTERIOR	I300/1	FL300K11	1	FLOOD	0	300	0.000	4368	0	TC/PC	NO CHANGE	I300/1		1	Z	0	300	0.000	0	0.00	0	

Aloha Systems Measured Savings
01. District Attorney Warehouse

		Existing Fixtures										New Fixtures					Savings						
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamps(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
																Total INCAN	14					0.57	2,357
Total						549		67.500			214,188	Total					549		46.329	145,291	21.171	68,897	

District Attorney Warehouse – 5300 Harbor Street



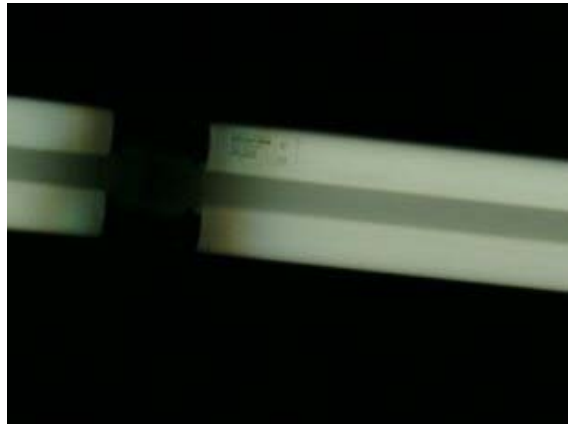
District Attorney Warehouse



Warehouse Fixtures



Warehouse 8' 2-lamp Ballast



Warehouse 8' Energy Saving Lamps



Wrap Fixture Ballast in Warehouse Office



2-lamp Energy Saver Magnetic Ballast

District Attorney Warehouse – 5300 Harbor Street



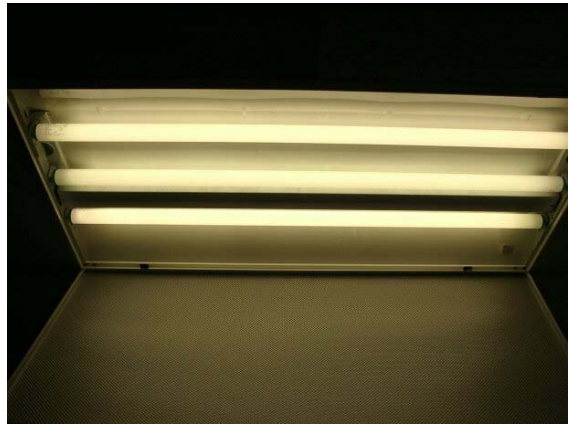
2 x 4 4-lamp Troffer Ballasts



2 x 4 4-lamp Troffer



2 x 4 3-lamp Troffer Ballasts



2 x 4 3-lamp Troffer



4' T12 lamp



Wrap Fixtures in Office Area

Site Measurement and Verification Report

Site Number 2

Warm Springs Rehab

38200 N. Lake Hughes Road, Castaic

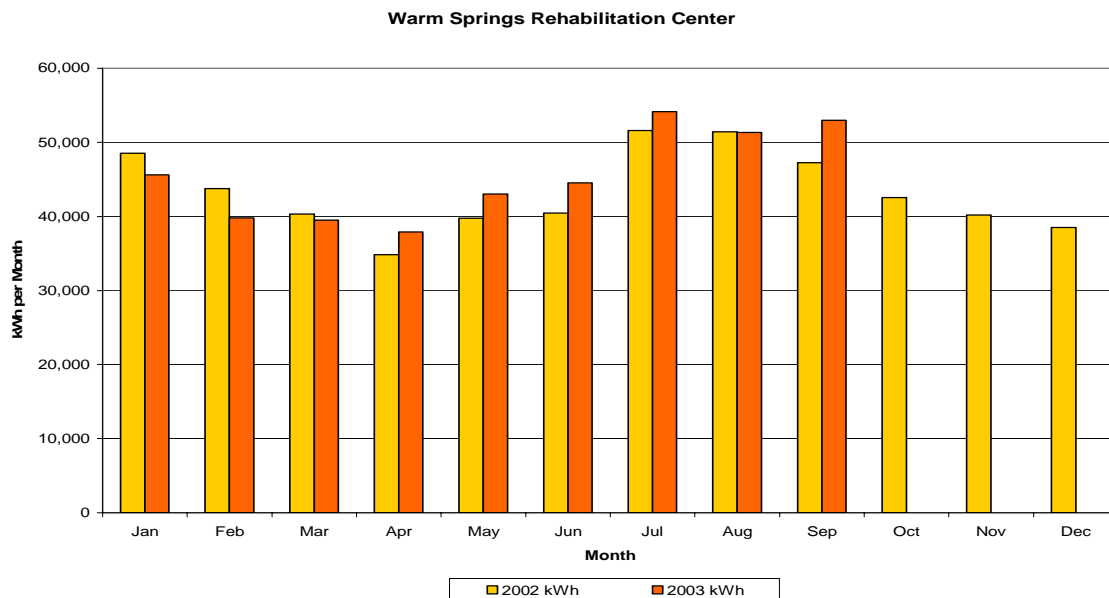
SCE Account 3-001-4069-07 and 3-002-8744-09

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	43,224 kWh
Contractor's As-Built Estimate	43,157 kWh
<i>Ex-Ante</i> Evaluation	55,762 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	35,026 kWh

Site Description

The Warm Springs Rehab facility is an alcohol and drug rehabilitation center located about 20 miles east of the 5 Freeway in Castaic. It is a former fire camp located on Lake Hughes Road in the mountains. The center is a combination of different small buildings. There are dorms that house residents of the rehab center. There is an administration building, a small medical center, kitchen facilities, recreation centers, and a variety of outbuildings used for storage. There are also buildings used for maintenance, a carpentry shop, and a variety of other service buildings.

Southern California Edison supplies the facility at 240 volts single phase through meter DXP671-000039. Its annual energy consumption in 2002 was 519,200 kWh, and its peak demand was 155 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.



Because the facility is a rehabilitation center, the dorm areas are open 24 hours a day. The other offices and buildings have differing operational hours. The storage area lighting, according to personal, has very minimal hours of operation.

Preliminary Site Visit

The site was visited on April 1, 2003. The lighting spreadsheet provided to us was not clear as to the location of lighting fixtures. Lighting was categorized as “general offices and dorms” and fixture counts were aggregated to come up with totals. This made it very difficult to match and quantify lighting fixtures. We found a variety of fixtures that was generally consistent with the preliminary sheets.

We also verified existing conditions of the fixtures. Incandescent lamps of a mixture of 100, 75, and 60 watt were found. Fluorescent lamps were energy-saving varieties, and the ballasts were energy saving magnetic ballasts. A few fixtures had already been retrofitted to T8 lamps. These include some of the fixtures in the administration, canteen, and dorm areas. They were noted in detail for later comparison with the post-installation spreadsheet in order to assure that credit was not taken for pre-existing T8 lamps.

Post-Retrofit Audit

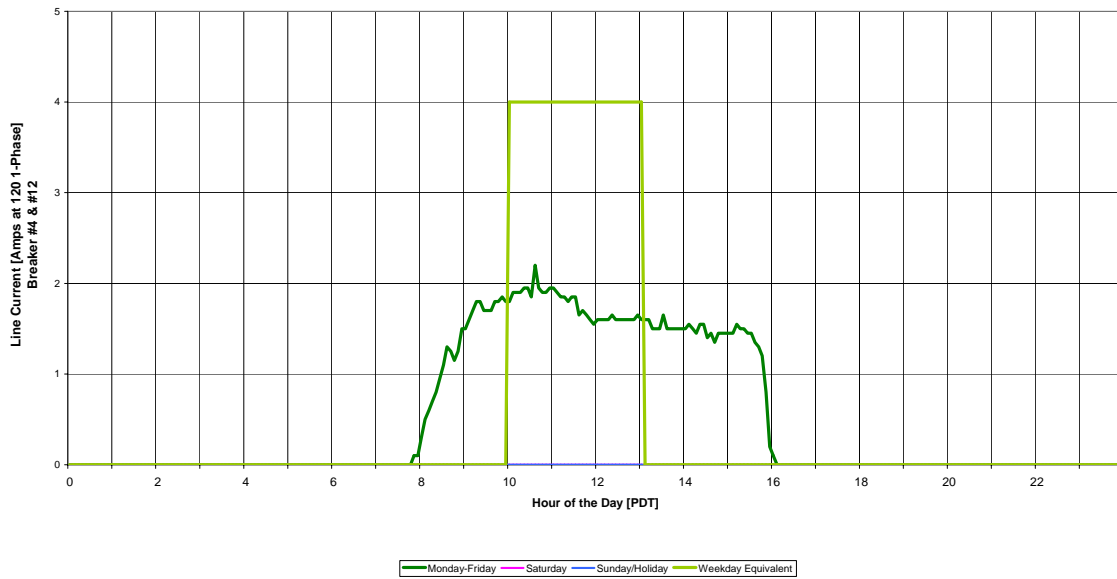
The site was again visited on July 16, 2003. The as built spreadsheet was verified during our post-retrofit walk through and everything was correct. We specifically re-verified the observations noted during the preliminary site visit. The fixtures that already were energy-efficient models were properly indicated in the spreadsheet with “zero” quantity, indicating that no change was made.

Metered Load Profiles

Dataloggers were placed in areas such as medical, kitchen, and carpenter shop. These areas were chosen because they represented a large amount of fixtures. These areas were also selected based on their various operating hours.

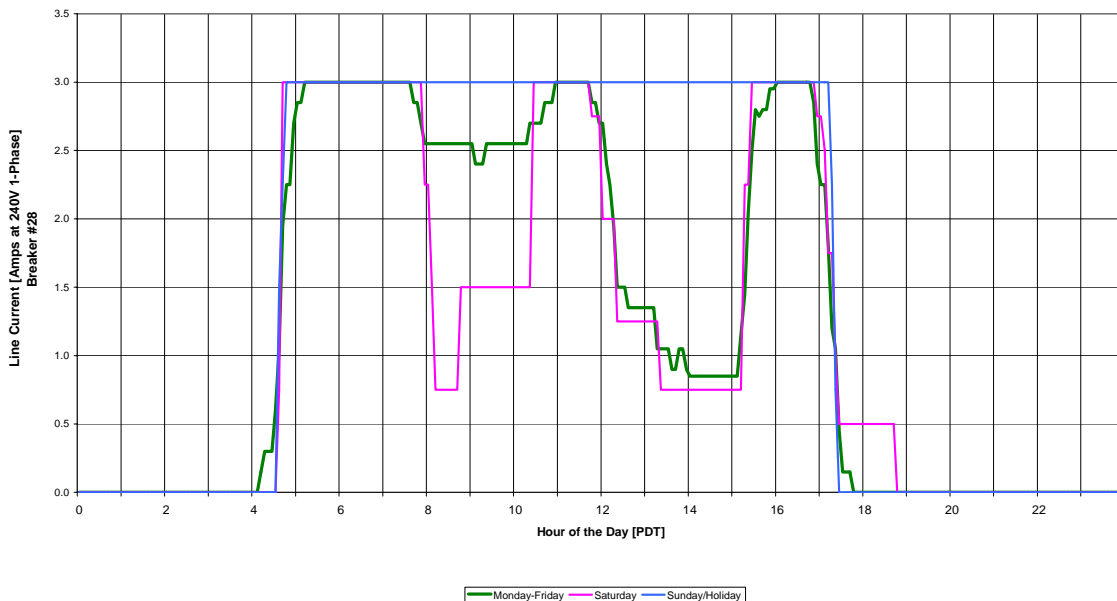
Carpenter Shop: The load profile on the following page shows the lights in the carpenter shop turn on at about 8:00 a.m. and turn off at about 4:00 p.m. We turned all of the lights on simultaneously when we installed the datalogger. The data collected demonstrate that this was the only time during the monitoring period when all of the lights were turned on at the same time. The contractor as built spreadsheet estimated 2880 operating hours. The operating time provided by the load profile is 741 hours per year. This value represents an aggregate of frequently used and seldom-used lights. It is used for all of the maintenance shops and similar areas and storage rooms, which is consistent with staff reports that the lights in many of them are seldom used.

Warm Springs Rehab. July/August
Carpenter Shop
Average Daily Load Profile

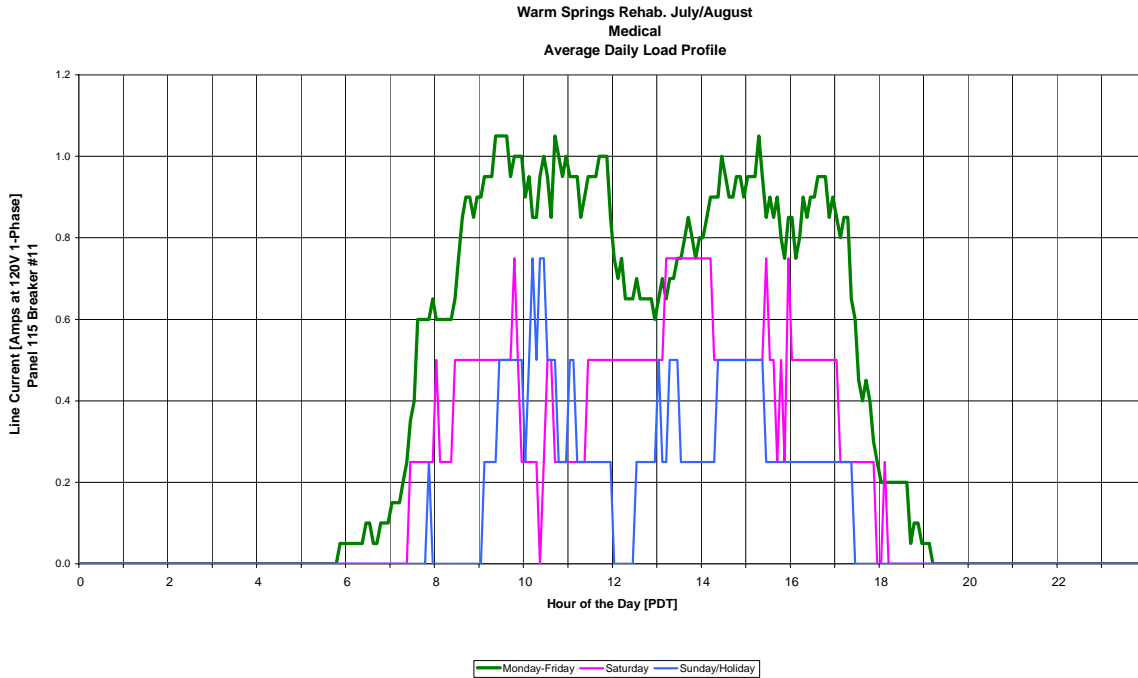


Kitchen Area: The load profile below represents the kitchen area. The lights are on from about 4:30 a.m. to 5:30 p.m. every day of the week. They are sometimes shut off between meal times, particularly in the afternoon between lunch and dinner. The contractor as built spreadsheet shows 4,380 operating hours for the kitchen area. The load profile provides a full load equivalent operating time is 3,791 hours per year. This value was used for the kitchen area as well as the dining hall.

Warm Springs Rehab. July/August
Kitchen
Average Daily Load Profile



Medical: The load profile below represents a few lights in the medical building. The lights are on from about 7:30 a.m. until about 6:00 p.m. with some variation from day to day. The contractor used 4,320 operating hours for the medical areas. The operating time estimated from the load profile is 2,656 hours per year.



A variety of operating hours were used by the contractor for the remaining rooms, often with apparent inconsistency within a given area. The contractor used 2,880 h/yr for most of the office areas. We believe this figure to be a reasonable estimate based upon staff reports and observed hours in the medical facility. It was kept as-is and also applied to other similar areas of the facility. Dorm rooms and activities areas used by the inmates were assigned a variety of operating hours, including 6570 and 3240. Most of the areas have considerable daylight, and many of the dorm lights were off when we visited, even though inmates were inside some of the dorms. We believe that 6570 is definitely too high for these areas. We used 4,380 h/yr (12 hours per day) as an average value for all of the inmate areas, including dorm rooms, activity rooms, restrooms, and the rehab center.

Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet). Line items that had zero quantity were not changed

from the contractor’s value, even if we believe the number is inaccurate; the savings are zero for these line items regardless of the operating times assigned to them.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

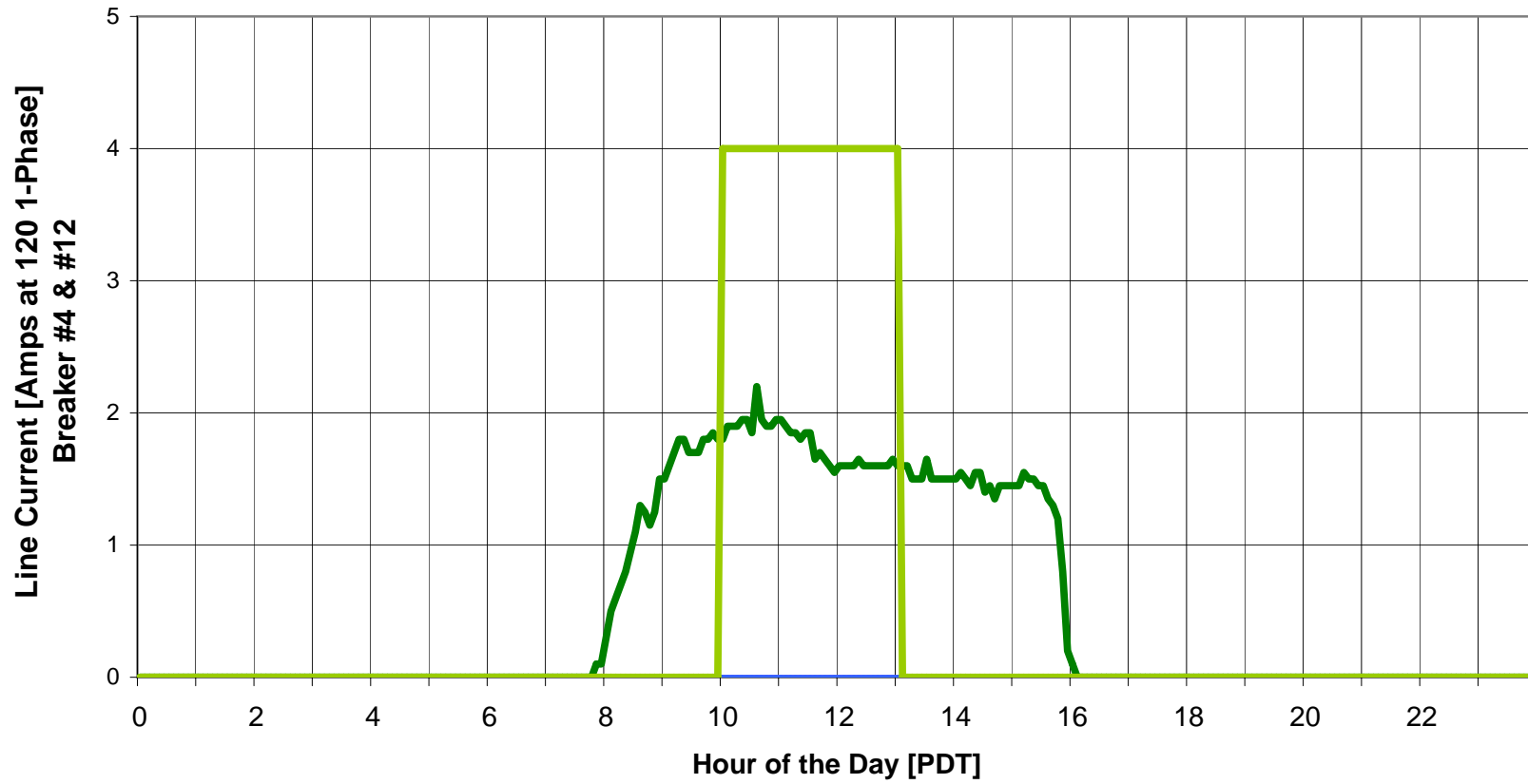
The following table delineates the savings at this site for each of the measure types included in the program.

Warm Springs Rehab Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	19	6,109	2	159	722	429
T12 to T8	269	28,017	253	26,373	43,675	22,841
Inc to CFL	57	9,098	72	16,784	11,366	11,756
Total	345	43,224	327	43,157	55,762	35,026

The official *ex-ante* savings estimate for this site is higher than either the proposed, as-built, or *ex-post* estimates because most of the fixtures in this site were two-lamp T12 fixtures with only a 27-watt reduction per fixture retrofit, while the average program-wide savings for T12 to T8 change was 40 watts. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county’s proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

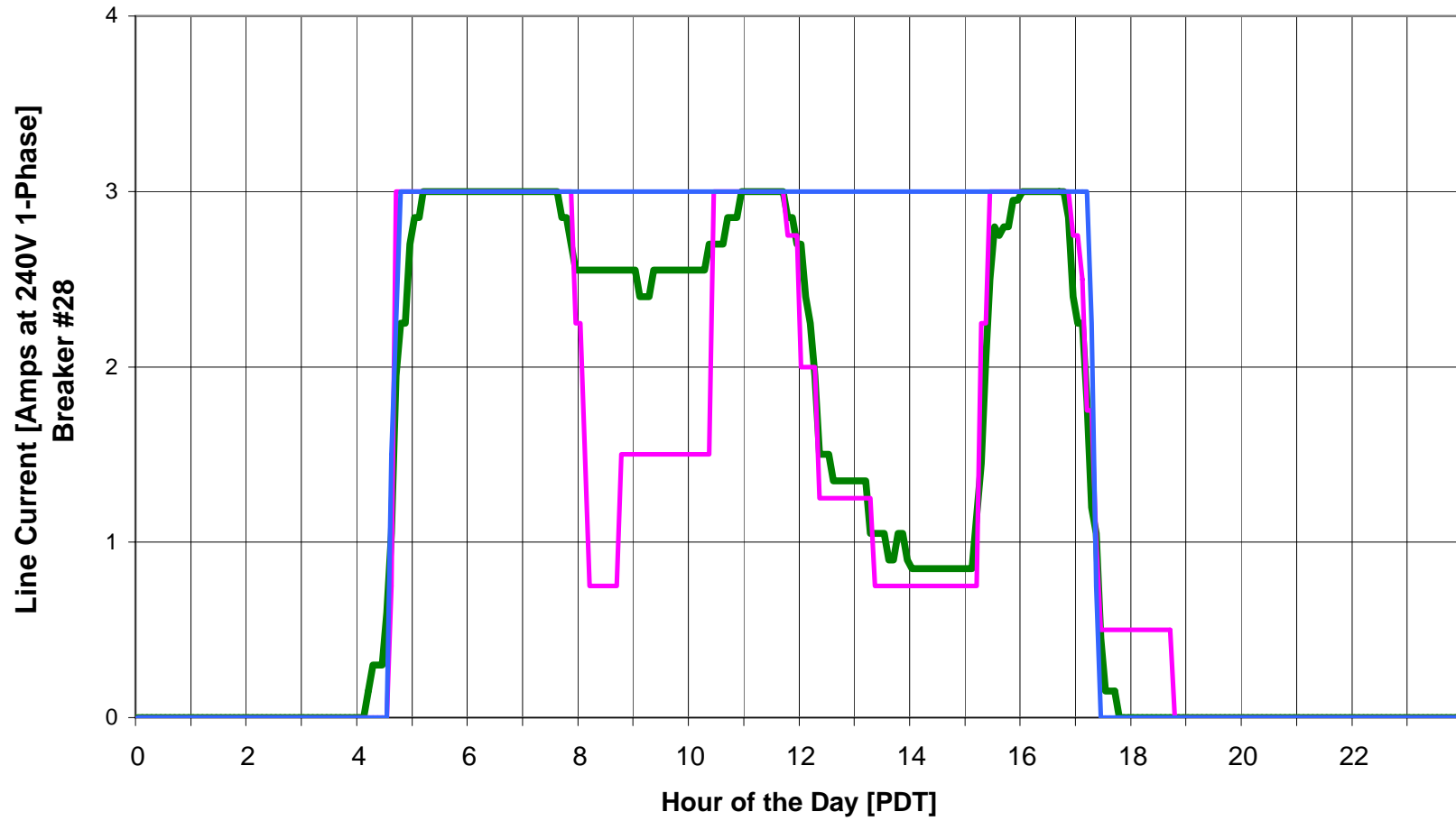
The *ex-post* savings is lower than the contractor’s estimate because the contractor assumed, on average, operating hours longer than actually observed and fixture counts were slightly less than originally assumed. The full-page load profiles and detailed fixture spreadsheets follow this narrative.

**Warm Springs Rehab. July/August
Carpenter Shop
Average Daily Load Profile**



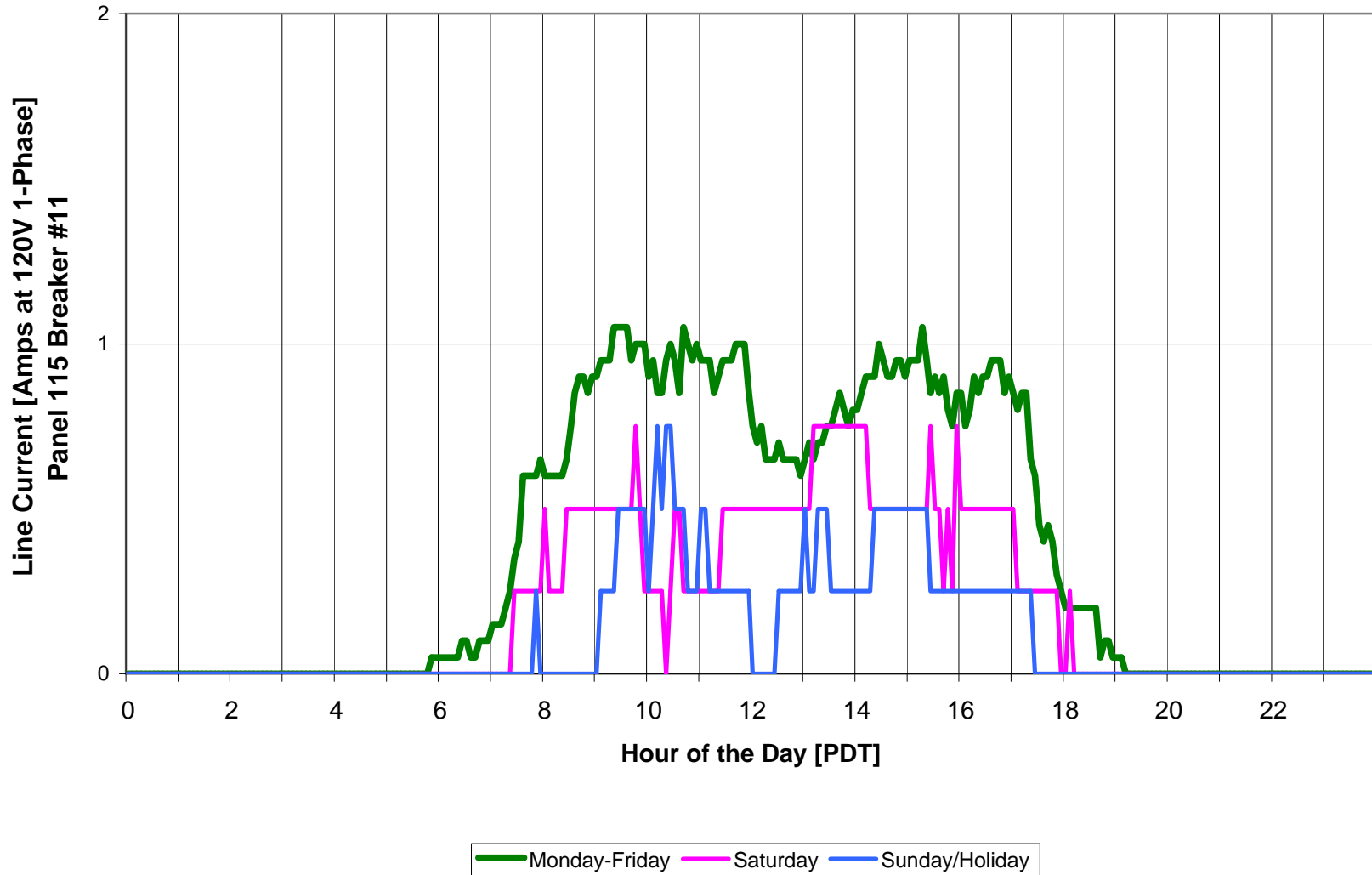
Monday-Friday Saturday Sunday/Holiday Weekday Equivalent

Warm Springs Rehab. July/August
Kitchen
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

Warm Springs Rehab. July/August
Medical
Average Daily Load Profile



Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
33	4-Coyote	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
41	5-Dorm	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
49	2-Dorm	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
57	3-Dorm	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
65	24-Storage	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	520	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
79	22- Activities	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
85	21-Paint Storage	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
88	Grounds	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
89	17-Rehab # 5	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
91	1-Canteen	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
106	13-Library	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
131	14-Storage	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
139	27-General Service	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
141	12-Admin	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
164	9-Rehab#1	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
174	8-Tree House	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
189	11-Rehab#2	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
192	6-Admissions	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
203	Visitor-RR	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	6570	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
206	RR	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	6570	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
208	Guard	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
																Total HID	0				0.000	0	
74	23-Laundry & Bath	ECF9/2	X9/2	2	Exit Sign	0	20	0.000	6570	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
99	1-Canteen	E140/1	X40/1	1	Exit Sign	1	40	0.040	3240	130		REPLACE	ELED2/1		1	New VEX Dual Circuit	1	6	0.006	18	0.035	112	
100	1-Canteen	ECF9/2	X9/2	2	Exit Sign	1	20	0.020	3240	65		REPLACE	ELED2/1		1	New VEX Dual Circuit	1	6	0.006	18	0.015	47	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
126	13-Kitchen	ECF9/2	X9/2	2	Exit Sign	0	20	0.000	8760	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
199	7-Dorm	ECF9/2	X9/2	2	Exit Sign	0	20	0.000	8760	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
																Total Exits	2				0.049	159	
1	34-Maintance	F42EE	W40CF2	2	Wrap	0	72	0.000	1440	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
2	34-Maintance	F42EE	W40CF2	2	Wrap	0	72	0.000	1440	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
3	34-Maintance	F42EE	W40CF2	2	Wrap	0	72	0.000	1095	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
4	34-Maintance	F41EE	W40CF1	1	Wrap	0	43	0.000	1095	0		RETROFIT	F41ILL(G3)		1	LBO	0	27	0.000	0	0.000	0	
5	34-Maintance	F42EE	W40CF2	2	Wrap	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
8	33-Waste water	F42EE	W40CF2	2	Wrap	2	72	0.144	520	75		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28	
13	31-Garage	F42EE	W40CF2	2	Wrap	11	72	0.792	2880	2,281		RETROFIT	F42ILL-R(G3)		2	LBO	11	45	0.495	1,426	0.297	855	
14	30-Repair	F42EE	W40PF2	2	Wrap	5	72	0.360	2880	1,037		RETROFIT	F42ILL-R(G3)		2	LBO	5	45	0.225	648	0.135	389	
15	30-Repair	F42EE	W40CF2	2	Wrap	1	72	0.072	6570	473		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	296	0.027	177	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
19	29-Welding	F42EE	W40PF2	2	Wrap	0	72	0.000	2880	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0
20	29-Welding	F42EE	W40PF2	2	Wrap	1	72	0.072	2880	207		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	130	0.027	78
23	29-Paint	F42EE	W40PF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
24	26-Carpenter	F42EE	W40PF2/TG	2	Wrap	15	72	1.080	2880	3,110		RETROFIT	F42ILL-R(G3)		2	LBO	15	45	0.675	1,944	0.405	1,166
27	26-Carpenter	F42EE	W40PF2	2	Wrap	3	72	0.216	2880	622		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	389	0.081	233
31	26-Carpenter	F42EE	W40PF2	2	Wrap	4	72	0.288	2880	829		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	518	0.108	311
35	4-Coyote	F42ILL	W32CF2	2	Wrap	0	59	0.000	2920	0		NO ACTION	F42ILL		0	Z	0	59	0.000	0	0.000	0
37	4-Coyote	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	6570	946		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	591	0.054	355
38	4-Coyote	F43EE	W40CF3	3	Wrap	2	115	0.230	6570	1,511		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	867	0.098	644
43	5-Dorm	F42ILL	W32CF2	2	Wrap	0	59	0.000	2920	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0
45	5-Dorm	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	6570	946		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	591	0.054	355
46	5-Dorm	F43EE	W40CF3	3	Wrap	2	115	0.230	6570	1,511		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	867	0.098	644
51	2-Dorm	F42ILL	W32CF2	2	Wrap	0	59	0.000	2920	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
53	2-Dorm	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	6570	946		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	591	0.054	355	
54	2-Dorm	F43EE	W40CF3	3	Wrap	2	115	0.230	6570	1,511		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	867	0.098	644	
59	3-Dorm	F42ILL	W32CF2	2	Wrap	0	59	0.000	3650	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
61	3-Dorm	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	6570	946		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	591	0.054	355	
62	3-Dorm	F43EE	W40CF3	3	Wrap	2	115	0.230	6570	1,511		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	867	0.098	644	
67	24-Storage	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
68	24-Storage	F22SS	Van20WF2	2	Wall Mount Vanity	2	56	0.112	6570	736		RETROFIT	F22ILL-R		2	LBO	2	29	0.058	378	0.054	357	
69	24-Storage	F42EE	W40CF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14	
70	23-Laundry & Bath	F42EE	V40CF2	2	Vapor Tight Wrap	4	72	0.288	4380	1,261		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	788	0.108	473	
71	23-Laundry & Bath	F42EE	V40CF2	2	Vapor Tight Wrap	4	72	0.288	6570	1,892		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	1,183	0.108	710	
73	23-Laundry & Bath	F42EE	W40CF2/TG	2	Wrap	1	72	0.072	6570	473		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	296	0.027	177	
76	23-Laundry & Bath	F42ILL	W32CF2	2	Wrap	0	59	0.000	3650	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
80	22- Activities	F42ILL	T32RF2	2	Troffer	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofitted or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
83	22- Activities	F42EE	W40CF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
84	21-Paint Storage	F42EE	W40CF2	2	Wrap	3	72	0.216	520	112		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	70	0.081	42
87	Grounds	F42EE	W40CF2	2	Wrap	2	72	0.144	520	75		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28
90	17-Rehab # 5	F82SL	S96CF2	2	Strip	2	136	0.272	520	141		RETROFIT	F44ILL-R(G3)		4	FIT KIT	2	88	0.176	92	0.096	50
93	1-Canteen	F42ILL	W32CF2	2	Wrap	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0
94	1-Canteen	F42EE	W40CF2	2	Wrap	17	72	1.224	1440	1,763		RETROFIT	F42ILL-R(G3)		2	LBO	17	45	0.765	1,102	0.459	661
97	1-Canteen	F42EE	W40CF2	2	Wrap	2	72	0.144	3240	467		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	292	0.054	175
98	1-Canteen	F42ILL	T32RF2	2	Troffer	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0
102	1-Canteen	F42EE	W40CF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
103	13-Library	F42EE	T40RF2	2	Troffer	6	72	0.432	3240	1,400		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	875	0.162	525
104	13-Library	F42EE	W40CF2	2	Wrap	2	72	0.144	3240	467		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	292	0.054	175
108	13-Kitchen	F42EE	W40CF2	2	Wrap	4	72	0.288	520	150		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	94	0.108	56
110	13-Kitchen	F42EE	W40CF2/TG	2	Wrap	1	72	0.072	8760	631		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	394	0.027	237

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
112	13-Kitchen	F42ILL	W32CF2	2	Wrap	0	59	0.000	520	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
113	13-Kitchen	F42EE	1X4T40RF2	2	1 x 4 Troffer	27	72	1.944	4380	8,515		RETROFIT	F42ILL-R(G3)		2	LBO	27	45	1.215	5,322	0.729	3,193	
114	13-Kitchen	F42EE	W40CF2/TG	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14	
119	13-Kitchen	F42EE	V40CF2	2	Vapor Tight Wrap	0	72	0.000	4380	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
120	13-Kitchen	F42EE	W40CF2	2	Wrap	2	72	0.144	1440	207		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	130	0.054	78	
121	13-Kitchen	F42EE	W40CF2/TG	2	Wrap	3	72	0.216	520	112		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	70	0.081	42	
123	13-Kitchen	F42EE	1X4T40RF2	2	1 x 4 Troffer	18	72	1.296	4380	5,676		RETROFIT	F42ILL-R(G3)		2	LBO	18	45	0.810	3,548	0.486	2,129	
124	13-Kitchen	F42EE	W40CF2	2	Wrap	0	72	0.000	3240	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
125	13-Kitchen	F42EE	W40CF2	2	Wrap	1	72	0.072	6570	473		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	296	0.027	177	
128	13-Kitchen	F44EE	W40CF4	4	Wrap	4	144	0.576	2880	1,659		RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,014	0.224	645	
129	13-Kitchen	F44EE	W40CF4	4	Wrap	1	144	0.144	2880	415		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	253	0.056	161	
130	14-Storage	F42ILL	W32CF2	2	Wrap	0	59	0.000	520	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
133	27-General Service	F42EE	W40CF2/TG	2	Wrap	7	72	0.504	2880	1,452		RETROFIT	F42ILL-R(G3)		2	LBO	7	45	0.315	907	0.189	544	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
134	27-General Service	F42EE	W40CF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156	
135	27-General Service	F42EE	W40CF2	2	Wrap	1	72	0.072	2880	207		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	130	0.027	78	
137	27-General Service	F42EE	1X4T40RF2	2	1 x 4 Troffer	0	72	0.000	1440	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
140	27-General Service	F42ILL	W32CF2	2	Wrap	0	59	0.000	1460	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
144	12-Admin	F42EE	W40CF2	2	Wrap	2	72	0.144	520	75		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28	
145	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
146	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
147	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
148	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
149	12-Admin	F22SS	Van20WF2	2	Wall Mount Vanity	2	56	0.112	6570	736		RETROFIT	F22ILL-R		2	LBO	2	29	0.058	378	0.054	357	
150	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
151	12-Admin	F42EE	W40CF2	2	Wrap	1	72	0.072	2880	207		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	130	0.027	78	
152	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
153	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
154	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
155	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	6570	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
156	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
158	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
159	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
160	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
161	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
163	9-Rehab#1	F42EE	W40CF2	2	Wrap	3	72	0.216	2880	622		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	389	0.081	233	
165	9-Rehab#1	F42EE	W40CF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156	
167	9-Rehab#1	F42EE	W40CF2	2	Wrap	1	72	0.072	3240	233		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	146	0.027	87	
168	9-Rehab#1	F22SS	Van20WF2	2	Wall Mount Vanity	1	56	0.056	6570	368		RETROFIT	F22ILL-R		2	LBO	1	29	0.029	189	0.027	179	
170	9-Rehab#1	F42EE	W40CF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
171	Medical	F42EE	W40CF2	2	Wrap	1	72	0.072	4320	311		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	194	0.027	117	
172	9-Rehab#1	F42EE	W40CF2	2	Wrap	4	72	0.288	4320	1,244		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	778	0.108	467	
176	8-Storage	F42EE	W40CF2	2	Wrap	2	72	0.144	520	75		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28	
177	Medical	F42EE	W40CF2	2	Wrap	1	72	0.072	8760	631		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	394	0.027	237	
178	Medical	F42EE	W40CF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14	
179	Medical	F42EE	W40CF2	2	Wrap	11	72	0.792	4160	3,295		RETROFIT	F42ILL-R(G3)		2	LBO	11	45	0.495	2,059	0.297	1,236	
180	Medical	F42EE	W40CF2	2	Wrap	3	72	0.216	4160	899		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	562	0.081	337	
181	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	
184	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	
185	Medical	F42EE	W40CF2	2	Wrap	4	72	0.288	4320	1,244		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	778	0.108	467	
187	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
188	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
191	11-Rehab#2	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
194	6-Admissions	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	
195	6-Admissions	F42ILL	W32CF2	2	Wrap	0	59	0.000	520	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
196	6-Admissions	F42ILL	W32CF2	2	Wrap	0	59	0.000	3650	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
197	6-Admissions	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	
198	7-Dorm	F42EE	W40CF2	2	Wrap	12	72	0.864	2920	2,523		RETROFIT	F42ILL-R(G3)		2	LBO	12	45	0.540	1,577	0.324	946	
200	7-Dorm	F42EE	V40CF2	2	Vapor Tight Wrap	3	72	0.216	6570	1,419		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	887	0.081	532	
201	7-Dorm	F42EE	B40CF2	2	Box Surface Mount	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
204	MRR	F42EE	W40CF2	2	Wrap	1	72	0.072	6570	473		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	296	0.027	177	
205	WRR	F42EE	W40CF2	2	Wrap	1	72	0.072	6570	473		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	296	0.027	177	
																Total T12-T8	253				7.195	26,373	
6	34-Maintenance	I75/1	K75C11	1	Keyless	1	75	0.075	6570	493		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	131	0.055	361	
10	33-Waste water	I75/1	K75C11	1	Keyless	2	75	0.150	520	78		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	21	0.110	57	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
13	32-Generator	I75/1	K75C11	1	Keyless	6	75	0.450	520	234		RETROFIT	CFQ15/1		1	TCP CFSI	6	20	0.120	62	0.330	172
16	30-Repair	I75/1	K75C11	1	Keyless	0	75	0.000	2880	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0
18	29-Welding	I75/1	K75C11	1	Keyless	5	75	0.375	2880	1,080		RETROFIT	CFQ15/1		1	TCP CFSI	5	20	0.100	288	0.275	792
21	29-Welding	I40/1	K40C11	1	Keyless	1	40	0.040	2880	115		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	58	0.020	58
22	29-Paint	I75/1	K75C11	1	Keyless	2	75	0.150	520	78		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	21	0.110	57
26	26-Carpenter	I60/1	K60C11	1	Keyless	1	60	0.060	2880	173		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	58	0.040	115
28	26-Carpenter	I60/2	Van60WI2	2	Wall Mount Vanity	2	120	0.240	6570	1,577		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	263	0.200	1,314
29	26-Carpenter	I60/2	Dr60CI2	2	Ceiling Mount Drum	2	120	0.240	6570	1,577		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	263	0.200	1,314
30	26-Carpenter	I75/2	Dr75CI2	2	Ceiling Mount Drum	2	150	0.300	1095	329		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	44	0.260	285
32	4-Coyote	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0
34	4-Coyote	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955
36	4-Coyote	I40/1	Tr40WI1	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		0	Z	0	40	0.000	0	0.000	0
39	4-Coyote	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
40	5-Dorm	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0
42	5-Dorm	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955
44	5-Dorm	I40/1	Tr40W11	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		1	Z	0	40	0.000	0	0.000	0
47	5-Dorm	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0
48	2-Dorm	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0
50	2-Dorm	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955
52	2-Dorm	I40/1	Tr40W11	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		1	Z	0	40	0.000	0	0.000	0
55	2-Dorm	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0
56	3-Dorm	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0
58	3-Dorm	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955
60	3-Dorm	I40/1	Tr40W11	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		1	Z	0	40	0.000	0	0.000	0
63	3-Dorm	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0
64	Boiler	I100/1	K100C11	1	Keyless	1	100	0.100	520	52		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.080	42

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
66	24-Storage	I60/1	K60C1	1	Keyless	1	60	0.060	520	31		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.040	21
72	23-Laundry & Bath	I75/1	K75C1	1	Keyless	2	75	0.150	6570	986		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	263	0.110	723
75	23-Laundry & Bath	I100/1	K100C1	1	Keyless	2	100	0.200	520	104		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	21	0.160	83
77	23-Laundry & Bath	I75/1	FL75K1	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0
78	22- Activities	I75/1	FL75K1	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0
81	22- Activities	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0
82	22- Activities	I75/1	K75C1	1	Keyless	1	75	0.075	6570	493		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	131	0.055	361
86	21-Paint Storage	I75/1	FL75K1	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0
87	Grounds	I50/1	K150C1	1	Keyless	2	50	0.100	520	52		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	21	0.060	31
92	1-Canteen	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0
95	1-Canteen	I50/1	K150C1	1	Keyless	2	50	0.100	1440	144		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	58	0.060	86
96	1-Canteen	I100/1	K100C1	1	Keyless	1	100	0.100	1440	144		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	29	0.080	115
101	1-Canteen	I60/1	K60C1	1	Keyless	1	60	0.060	520	31		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.040	21

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
105	13-Library	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
107	13-Kitchen	I60/1	K60C1	1	Keyless	1	60	0.060	6570	394		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	131	0.040	263	
109	13-Kitchen	I60/1	K60C1	1	Keyless	2	60	0.120	520	62		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	21	0.080	42	
111	13-Kitchen	I60/1	K60C1	1	Keyless	1	60	0.060	8760	526		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	175	0.040	350	
115	13-Kitchen	I40/1	KE40C1	1	EXPLOSION	0	40	0.000	520	0		NO ACTION	I40/1		1	Z	0	40	0.000	0	0.000	0	
116	13-Kitchen	I60/1	KE60C1	1	EXPLOSION	0	60	0.000	4380	0		NO ACTION	I60/1		1	Z	0	60	0.000	0	0.000	0	
117	13-Kitchen	I60/1	K60C1/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955	
118	13-Kitchen	I60/1	K60C1	1	Keyless	2	60	0.120	520	62		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	21	0.080	42	
122	13-Kitchen	I60/1	K60C1/RD	1	Keyless/EMG	0	60	0.000	8760	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
127	13-Kitchen	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
132	27-General Service	I75/1	CanPAR 75/1	1	Recessed Can	1	75	0.075	8760	657		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	289	0.042	368	
136	27-General Service	I75/1	K75C1	1	Keyless	1	75	0.075	520	39		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.055	29	
138	27-General Service	I75/1	CanPAR 75/1	1	Recessed Can	0	75	0.000	8760	0		RETROFIT	CFQ26/1		1	TCP CFSI	0	33	0.000	0	0.000	0	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
142	12-Admin	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
143	12-Admin	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
157	10-Rehab#3	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
162	9-Rehab#1	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
166	9-Rehab#1	I100/1	K100C11	1	Keyless	0	100	0.000	520	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
169	9-Rehab#1	I60/2	Van60WI2	2	Wall Mount Vanity	2	120	0.240	6570	1,577		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	263	0.200	1,314	
173	9-Rehab#1	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	8760	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
175	8-Tree House	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
182	Medical	I100/1	K100C11	1	Keyless	1	100	0.100	6570	657		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	131	0.080	526	
183	Medical	I75/1	K75C11	1	Keyless	1	75	0.075	520	39		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.055	29	
186	Medical	I100/1	K100C11	1	Keyless	2	100	0.200	6570	1,314		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	263	0.160	1,051	
190	11-Rehab#2	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
193	6-Admissions	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	

Contractor As-Built Savings
02. Warm Springs Rehabilitation Center

		Existing Fixtures										New Fixtures										Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
202	7-Dorm	CFT13/1	PL13	1	storage	0	17	0.000	520	0		NO ACTION	CFT13/1		1	Z	0	17	0.000	0	0.000	0		
207	Guard	I75/1	K75CI1	1	Keyless	1	75	0.075	4320	324		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	86	0.055	238		
113A	KITCHEN	I60/1		1	Keyless	10	60	0.600	4380	2,628		RETROFIT				TCP CFSI	10	20	0.200	876	0.400	1,752		
																Total INCAN	72				4.117	16,784		
TOTAL						327		24.453			89,545		TOTAL						327		6.546	23,273	11.361	43,157

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
33	4-Coyote	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
41	5-Dorm	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
49	2-Dorm	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
57	3-Dorm	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
65	24-Storage	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	520	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
79	22- Activities	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
85	21-Paint Storage	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
88	Grounds	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
89	17-Rehab # 5	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
91	1-Canteen	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
106	13-Library	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
131	14-Storage	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
139	27-General Service	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
141	12-Admin	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
164	9-Rehab#1	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
174	8-Tree House	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
189	11-Rehab#2	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
192	6-Admissions	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
203	Visitor-RR	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	6570	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
206	RR	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	6570	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
208	Guard	HPS70/1	WP70HPS1	1	Wall Pack Exterior	0	95	0.000	5110	0		NO ACTION	HPS70/1		1	Z	0	95	0.000	0	0.000	0	
																Total HID	0		0.000	0	0.000	0	
																			0.000	0			
74	23-Laundry & Bath	ECF9/2	X9/2	2	Exit Sign	0	20	0.000	6570	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
99	1-Canteen	EI40/1	X40/1	1	Exit Sign	1	40	0.040	8760	350		REPLACE	ELED2/1		1	New VEX Dual Circuit	1	6	0.006	48	0.035	302	
100	1-Canteen	ECF9/2	X9/2	2	Exit Sign	1	20	0.020	8760	175		REPLACE	ELED2/1		1	New VEX Dual Circuit	1	6	0.006	48	0.015	127	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
126	13-Kitchen	ECF9/2	X9/2	2	Exit Sign	0	20	0.000	8760	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
199	7-Dorm	ECF9/2	X9/2	2	Exit Sign	0	20	0.000	8760	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
																Total Exits	2				0.049	429	
1	34-Maintance	F42EE	W40CF2	2	Wrap	0	72	0.000	741	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
2	34-Maintance	F42EE	W40CF2	2	Wrap	0	72	0.000	741	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
3	34-Maintance	F42EE	W40CF2	2	Wrap	0	72	0.000	741	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
4	34-Maintance	F41EE	W40CF1	1	Wrap	0	43	0.000	741	0		RETROFIT	F41ILL(G3)		1	LBO	0	27	0.000	0	0.000	0	
5	34-Maintance	F42EE	W40CF2	2	Wrap	1	72	0.072	741	53		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	33	0.027	20	
8	33-Waste water	F42EE	W40CF2	2	Wrap	2	72	0.144	741	107		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	67	0.054	40	
13	31-Garage	F42EE	W40CF2	2	Wrap	11	72	0.792	741	587		RETROFIT	F42ILL-R(G3)		2	LBO	11	45	0.495	367	0.297	220	
14	30-Repair	F42EE	W40PF2	2	Wrap	5	72	0.360	741	267		RETROFIT	F42ILL-R(G3)		2	LBO	5	45	0.225	167	0.135	100	
15	30-Repair	F42EE	W40CF2	2	Wrap	1	72	0.072	741	53		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	33	0.027	20	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
19	29-Welding	F42EE	W40PF2	2	Wrap	0	72	0.000	741	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
20	29-Welding	F42EE	W40PF2	2	Wrap	1	72	0.072	741	53		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	33	0.027	20	
23	29-Paint	F42EE	W40PF2	2	Wrap	1	72	0.072	741	53		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	33	0.027	20	
24	26-Carpenter	F42EE	W40PF2/TG	2	Wrap	15	72	1.080	741	800		RETROFIT	F42ILL-R(G3)		2	LBO	15	45	0.675	500	0.405	300	
27	26-Carpenter	F42EE	W40PF2	2	Wrap	3	72	0.216	741	160		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	100	0.081	60	
31	26-Carpenter	F42EE	W40PF2	2	Wrap	4	72	0.288	741	213		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	133	0.108	80	
35	4-Coyote	F42ILL	W32CF2	2	Wrap	0	59	0.000	2920	0		NO ACTION	F42ILL		0	Z	0	59	0.000	0	0.000	0	
37	4-Coyote	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
38	4-Coyote	F43EE	W40CF3	3	Wrap	2	115	0.230	4380	1,007		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	578	0.098	429	
43	5-Dorm	F42ILL	W32CF2	2	Wrap	0	59	0.000	2920	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
45	5-Dorm	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
46	5-Dorm	F43EE	W40CF3	3	Wrap	2	115	0.230	4380	1,007		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	578	0.098	429	
51	2-Dorm	F42ILL	W32CF2	2	Wrap	0	59	0.000	2920	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
53	2-Dorm	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
54	2-Dorm	F43EE	W40CF3	3	Wrap	2	115	0.230	4380	1,007		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	578	0.098	429	
59	3-Dorm	F42ILL	W32CF2	2	Wrap	0	59	0.000	3650	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
61	3-Dorm	F42EE	V34CF2	2	Vapor Tight Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
62	3-Dorm	F43EE	W40CF3	3	Wrap	2	115	0.230	4380	1,007		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	578	0.098	429	
67	24-Storage	F42ILL	W32CF2	2	Wrap	0	59	0.000	741	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
68	24-Storage	F22SS	Van20WF2	2	Wall Mount Vanity	2	56	0.112	741	83		RETROFIT	F22ILL-R		2	LBO	2	29	0.058	43	0.054	40	
69	24-Storage	F42EE	W40CF2	2	Wrap	1	72	0.072	741	53		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	33	0.027	20	
70	23-Laundry & Bath	F42EE	V40CF2	2	Vapor Tight Wrap	4	72	0.288	4380	1,261		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	788	0.108	473	
71	23-Laundry & Bath	F42EE	V40CF2	2	Vapor Tight Wrap	4	72	0.288	4380	1,261		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	788	0.108	473	
73	23-Laundry & Bath	F42EE	W40CF2/TG	2	Wrap	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
76	23-Laundry & Bath	F42ILL	W32CF2	2	Wrap	0	59	0.000	3650	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
80	22- Activities	F42ILL	T32RF2	2	Troffer	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
83	22- Activities	F42EE	W40CF2	2	Wrap	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
84	21-Paint Storage	F42EE	W40CF2	2	Wrap	3	72	0.216	741	160		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	100	0.081	60	
87	Grounds	F42EE	W40CF2	2	Wrap	2	72	0.144	741	107		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	67	0.054	40	
90	17-Rehab # 5	F82SL	S96CF2	2	Strip	2	136	0.272	4380	1,191		RETROFIT	F44ILL-R(G3)		4	FIT KIT	2	88	0.176	771	0.096	420	
93	1-Canteen	F42ILL	W32CF2	2	Wrap	0	59	0.000	3791	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
94	1-Canteen	F42EE	W40CF2	2	Wrap	17	72	1.224	3791	4,640		RETROFIT	F42ILL-R(G3)		2	LBO	17	45	0.765	2,900	0.459	1,740	
97	1-Canteen	F42EE	W40CF2	2	Wrap	2	72	0.144	3791	546		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	341	0.054	205	
98	1-Canteen	F42ILL	T32RF2	2	Troffer	0	59	0.000	3791	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
102	1-Canteen	F42EE	W40CF2	2	Wrap	1	72	0.072	3791	273		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	171	0.027	102	
103	13-Library	F42EE	T40RF2	2	Troffer	6	72	0.432	4380	1,892		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,183	0.162	710	
104	13-Library	F42EE	W40CF2	2	Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
108	13-Kitchen	F42EE	W40CF2	2	Wrap	4	72	0.288	3791	1,092		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	682	0.108	409	
110	13-Kitchen	F42EE	W40CF2/TG	2	Wrap	1	72	0.072	3791	273		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	171	0.027	102	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
112	13-Kitchen	F42ILL	W32CF2	2	Wrap	0	59	0.000	3791	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
113	13-Kitchen	F42EE	1X4T40RF2	2	1 x 4 Troffer	27	72	1.944	3791	7,370		RETROFIT	F42ILL-R(G3)		2	LBO	27	45	1.215	4,606	0.729	2,764	
114	13-Kitchen	F42EE	W40CF2/TG	2	Wrap	1	72	0.072	3791	273		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	171	0.027	102	
119	13-Kitchen	F42EE	V40CF2	2	Vapor Tight Wrap	0	72	0.000	3791	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
120	13-Kitchen	F42EE	W40CF2	2	Wrap	2	72	0.144	3791	546		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	341	0.054	205	
121	13-Kitchen	F42EE	W40CF2/TG	2	Wrap	3	72	0.216	3791	819		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	512	0.081	307	
123	13-Kitchen	F42EE	1X4T40RF2	2	1 x 4 Troffer	18	72	1.296	3791	4,913		RETROFIT	F42ILL-R(G3)		2	LBO	18	45	0.810	3,071	0.486	1,842	
124	13-Kitchen	F42EE	W40CF2	2	Wrap	0	72	0.000	3791	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
125	13-Kitchen	F42EE	W40CF2	2	Wrap	1	72	0.072	3791	273		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	171	0.027	102	
128	13-Kitchen	F44EE	W40CF4	4	Wrap	4	144	0.576	3791	2,184		RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,334	0.224	849	
129	13-Kitchen	F44EE	W40CF4	4	Wrap	1	144	0.144	3791	546		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	334	0.056	212	
130	14-Storage	F42ILL	W32CF2	2	Wrap	0	59	0.000	520	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
133	27-General Service	F42EE	W40CF2/TG	2	Wrap	7	72	0.504	2880	1,452		RETROFIT	F42ILL-R(G3)		2	LBO	7	45	0.315	907	0.189	544	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
134	27-General Service	F42EE	W40CF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156	
135	27-General Service	F42EE	W40CF2	2	Wrap	1	72	0.072	2880	207		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	130	0.027	78	
137	27-General Service	F42EE	1X4T40RF2	2	1 x 4 Troffer	0	72	0.000	1440	0		RETROFIT	F42ILL-R(G3)		2	LBO	0	45	0.000	0	0.000	0	
140	27-General Service	F42ILL	W32CF2	2	Wrap	0	59	0.000	1460	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
144	12-Admin	F42EE	W40CF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156	
145	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
146	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
147	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
148	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
149	12-Admin	F22SS	Van20WF2	2	Wall Mount Vanity	2	56	0.112	2880	323		RETROFIT	F22ILL-R		2	LBO	2	29	0.058	166	0.054	157	
150	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
151	12-Admin	F42EE	W40CF2	2	Wrap	1	72	0.072	2880	207		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	130	0.027	78	
152	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
153	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
154	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
155	12-Admin	F42ILL	W32CF2	2	Wrap	0	59	0.000	6570	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
156	12-Admin	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
158	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
159	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
160	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	2880	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
161	10-Rehab#3	F42ILL	T32RF2	2	Troffer	0	59	0.000	3240	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
163	9-Rehab#1	F42EE	W40CF2	2	Wrap	3	72	0.216	4380	946		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	591	0.081	355	
165	9-Rehab#1	F42EE	W40CF2	2	Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	
167	9-Rehab#1	F42EE	W40CF2	2	Wrap	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
168	9-Rehab#1	F22SS	Van20WF2	2	Wall Mount Vanity	1	56	0.056	4380	245		RETROFIT	F22ILL-R		2	LBO	1	29	0.029	126	0.027	119	
170	9-Rehab#1	F42EE	W40CF2	2	Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
171	Medical	F42EE	W40CF2	2	Wrap	1	72	0.072	2656	191		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	120	0.027	72	
172	9-Rehab#1	F42EE	W40CF2	2	Wrap	4	72	0.288	4380	1,261		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	788	0.108	473	
176	8-Storage	F42EE	W40CF2	2	Wrap	2	72	0.144	520	75		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28	
177	Medical	F42EE	W40CF2	2	Wrap	1	72	0.072	2656	191		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	120	0.027	72	
178	Medical	F42EE	W40CF2	2	Wrap	1	72	0.072	2656	191		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	120	0.027	72	
179	Medical	F42EE	W40CF2	2	Wrap	11	72	0.792	2656	2,104		RETROFIT	F42ILL-R(G3)		2	LBO	11	45	0.495	1,315	0.297	789	
180	Medical	F42EE	W40CF2	2	Wrap	3	72	0.216	2656	574		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	359	0.081	215	
181	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	2656	382		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	239	0.054	143	
184	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	2656	382		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	239	0.054	143	
185	Medical	F42EE	W40CF2	2	Wrap	4	72	0.288	2656	765		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	478	0.108	287	
187	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	2656	382		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	239	0.054	143	
188	Medical	F42EE	W40CF2	2	Wrap	2	72	0.144	2656	382		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	239	0.054	143	
191	11-Rehab#2	F42EE	W40CF2	2	Wrap	2	72	0.144	4380	631		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	394	0.054	237	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
194	6-Admissions	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	
195	6-Admissions	F42ILL	W32CF2	2	Wrap	0	59	0.000	520	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
196	6-Admissions	F42ILL	W32CF2	2	Wrap	0	59	0.000	3650	0		NO ACTION	F42ILL		2	Z	0	59	0.000	0	0.000	0	
197	6-Admissions	F42EE	W40CF2	2	Wrap	2	72	0.144	4320	622		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	389	0.054	233	
198	7-Dorm	F42EE	W40CF2	2	Wrap	12	72	0.864	4380	3,784		RETROFIT	F42ILL-R(G3)		2	LBO	12	45	0.540	2,365	0.324	1,419	
200	7-Dorm	F42EE	V40CF2	2	Vapor Tight Wrap	3	72	0.216	4380	946		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	591	0.081	355	
201	7-Dorm	F42EE	B40CF2	2	Box Surface Mount	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
204	MRR	F42EE	W40CF2	2	Wrap	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
205	WRR	F42EE	W40CF2	2	Wrap	1	72	0.072	4380	315		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	197	0.027	118	
																Total T12-T8	253				7.195	22,841	
6	34-Maintenance	I75/1	K75C11	1	Keyless	1	75	0.075	741	56		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	15	0.055	41	
10	33-Waste water	I75/1	K75C11	1	Keyless	2	75	0.150	741	111		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	30	0.110	82	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
13	32-Generator	I75/1	K75C11	1	Keyless	6	75	0.450	741	333		RETROFIT	CFQ15/1		1	TCP CFSI	6	20	0.120	89	0.330	245	
16	30-Repair	I75/1	K75C11	1	Keyless	0	75	0.000	741	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
18	29-Welding	I75/1	K75C11	1	Keyless	5	75	0.375	741	278		RETROFIT	CFQ15/1		1	TCP CFSI	5	20	0.100	74	0.275	204	
21	29-Welding	I40/1	K40C11	1	Keyless	1	40	0.040	741	30		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	15	0.020	15	
22	29-Paint	I75/1	K75C11	1	Keyless	2	75	0.150	741	111		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	30	0.110	82	
26	26-Carpenter	I60/1	K60C11	1	Keyless	1	60	0.060	741	44		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	15	0.040	30	
28	26-Carpenter	I60/2	Van60WI2	2	Wall Mount Vanity	2	120	0.240	741	178		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	30	0.200	148	
29	26-Carpenter	I60/2	Dr60C12	2	Ceiling Mount Drum	2	120	0.240	741	178		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	30	0.200	148	
30	26-Carpenter	I75/2	Dr75C12	2	Ceiling Mount Drum	2	150	0.300	741	222		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	30	0.260	193	
32	4-Coyote	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
34	4-Coyote	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	4380	526		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	48	0.109	477	
36	4-Coyote	I40/1	Tr40WI1	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		0	Z	0	40	0.000	0	0.000	0	
39	4-Coyote	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
40	5-Dorm	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
42	5-Dorm	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955	
44	5-Dorm	I40/1	Tr40W11	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		1	Z	0	40	0.000	0	0.000	0	
47	5-Dorm	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
48	2-Dorm	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
50	2-Dorm	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955	
52	2-Dorm	I40/1	Tr40W11	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		1	Z	0	40	0.000	0	0.000	0	
55	2-Dorm	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
56	3-Dorm	I60/1	K60C11/GR	1	Keyless	0	60	0.000	2920	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
58	3-Dorm	I60/1	K60C11/RD	1	Keyless/EMG	2	60	0.120	8760	1,051		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	96	0.109	955	
60	3-Dorm	I40/1	Tr40W11	1	Track	0	40	0.000	1440	0		NO CHANGE	I40/1		1	Z	0	40	0.000	0	0.000	0	
63	3-Dorm	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
64	Boiler	I100/1	K100C11	1	Keyless	1	100	0.100	520	52		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.080	42	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
66	24-Storage	I60/1	K60C1	1	Keyless	1	60	0.060	520	31		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	10	0.040	21	
72	23-Laundry & Bath	I75/1	K75C1	1	Keyless	2	75	0.150	4380	657		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	175	0.110	482	
75	23-Laundry & Bath	I100/1	K100C1	1	Keyless	2	100	0.200	4380	876		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	175	0.160	701	
77	23-Laundry & Bath	I75/1	FL75K1	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
78	22- Activities	I75/1	FL75K1	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
81	22- Activities	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
82	22- Activities	I75/1	K75C1	1	Keyless	1	75	0.075	4380	329		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	88	0.055	241	
86	21-Paint Storage	I75/1	FL75K1	1	Flood	0	75	0.000	741	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
87	Grounds	I50/1	K150C1	1	Keyless	2	50	0.100	741	74		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	30	0.060	44	
92	1-Canteen	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	3791	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
95	1-Canteen	I50/1	K150C1	1	Keyless	2	50	0.100	3791	379		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	152	0.060	227	
96	1-Canteen	I100/1	K100C1	1	Keyless	1	100	0.100	3791	379		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	76	0.080	303	
101	1-Canteen	I60/1	K60C1	1	Keyless	1	60	0.060	3791	227		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	76	0.040	152	

Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
105	13-Library	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
107	13-Kitchen	I60/1	K60C1	1	Keyless	1	60	0.060	3791	227		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	76	0.040	152	
109	13-Kitchen	I60/1	K60C1	1	Keyless	2	60	0.120	3791	455		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	152	0.080	303	
111	13-Kitchen	I60/1	K60C1	1	Keyless	1	60	0.060	3791	227		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	76	0.040	152	
115	13-Kitchen	I40/1	KE40C1	1	EXPLOSION	0	40	0.000	3791	0		NO ACTION	I40/1		1	Z	0	40	0.000	0	0.000	0	
116	13-Kitchen	I60/1	KE60C1	1	EXPLOSION	0	60	0.000	3791	0		NO ACTION	I60/1		1	Z	0	60	0.000	0	0.000	0	
117	13-Kitchen	I60/1	K60C1/RD	1	Keyless/EMG	2	60	0.120	3791	455		REPLACE	ELED2/1		1	New VEX Dual Circuit	2	6	0.011	42	0.109	413	
118	13-Kitchen	I60/1	K60C1	1	Keyless	2	60	0.120	3791	455		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	152	0.080	303	
122	13-Kitchen	I60/1	K60C1/RD	1	Keyless/EMG	0	60	0.000	3791	0		REPLACE	ELED2/1		1	New VEX Dual Circuit	0	6	0.000	0	0.000	0	
127	13-Kitchen	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	3791	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
132	27-General Service	I75/1	CanPAR 75/1	1	Recessed Can	1	75	0.075	2880	216		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	95	0.042	121	
136	27-General Service	I75/1	K75C1	1	Keyless	1	75	0.075	2880	216		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	58	0.055	158	
138	27-General Service	I75/1	CanPAR 75/1	1	Recessed Can	0	75	0.000	8760	0		RETROFIT	CFQ26/1		1	TCP CFSI	0	33	0.000	0	0.000	0	

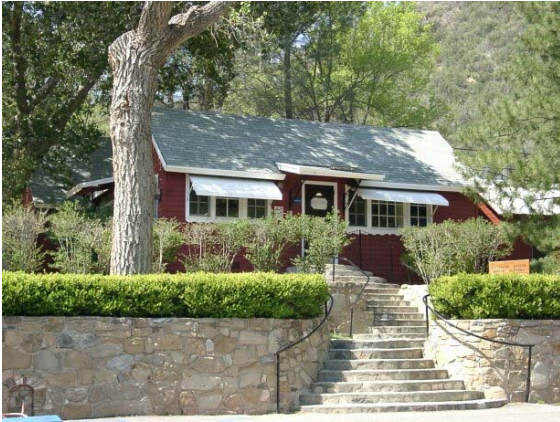
Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
142	12-Admin	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
143	12-Admin	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
157	10-Rehab#3	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	5110	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
162	9-Rehab#1	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
166	9-Rehab#1	I100/1	K100C11	1	Keyless	0	100	0.000	520	0		RETROFIT	CFQ15/1		1	TCP CFSI	0	20	0.000	0	0.000	0	
169	9-Rehab#1	I60/2	Van60WI2	2	Wall Mount Vanity	2	120	0.240	4380	1,051		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	175	0.200	876	
173	9-Rehab#1	CFQ26/1	WP26CF1		Wall Pack Exterior	0	33	0.000	8760	0		NO ACTION	CFQ26/1			Z	0	33	0.000	0	0.000	0	
175	8-Tree House	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
182	Medical	I100/1	K100C11	1	Keyless	1	100	0.100	2656	266		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	53	0.080	212	
183	Medical	I75/1	K75C11	1	Keyless	1	75	0.075	2656	199		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	53	0.055	146	
186	Medical	I100/1	K100C11	1	Keyless	2	100	0.200	2656	531		RETROFIT	CFQ15/1		1	TCP CFSI	2	20	0.040	106	0.160	425	
190	11-Rehab#2	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	
193	6-Admissions	I75/1	FL75K11	1	Flood	0	75	0.000	5110	0		NO CHANGE	I75/1		1	Z-?Abandoned	0	75	0.000	0	0.000	0	

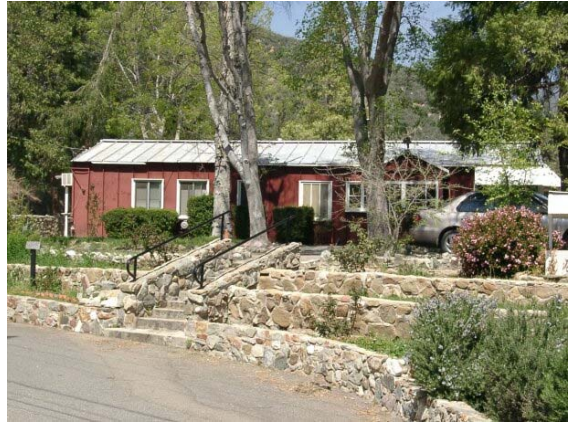
Aloha Systems Measured Savings
02. Warm Springs Rehab Center

		Existing Fixtures										New Fixtures										Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen., & A/B	Retrfit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
202	7-Dorm	CFT13/1	PL13	1	storage	0	17	0.000	520	0		NO ACTION	CFT13/1		1	Z	0	17	0.000	0	0.000	0		
207	Guard	I75/1	K75C11	1	Keyless	1	75	0.075	4320	324		RETROFIT	CFQ15/1		1	TCP CFSI	1	20	0.020	86	0.055	238		
113A	KITCHEN	I60/1		1	Keyless	10	60	0.600	3791	2,275		RETROFIT				TCP CFSI	10	20	0.200	758	0.400	1,516		
																Total INCAN	72				4.117	11,756		
TOTAL						327		24.453		75,786			TOTAL						327		13.092	40,759	11.361	35,027

Castaic Warm Springs Rehab – 38200 N. Lake Hughes Road



Warm Springs Administration Building



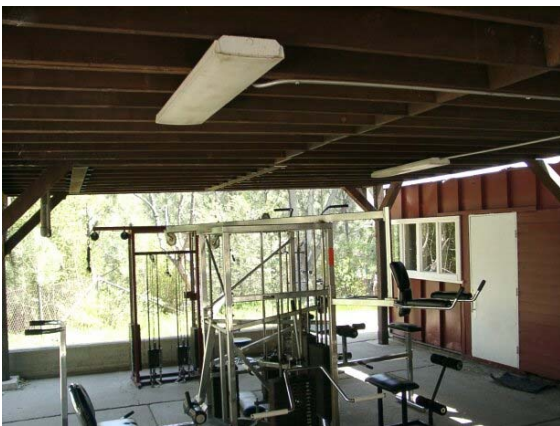
Rehab Lodge



Kitchen and Dorm Buildings



Maintenance Shop Building



Outdoor Exercise Area Wrap Fixtures



Medical Building

Castaic Warm Springs Rehab – 38200 N. Lake Hughes Road



Storage Shed



Carpenter Shop Fixtures



Office Wrap Fixtures



Office Wrap And Spotlight



Boiler Area Wrap Fixture



Boiler Area Wrap Fixture Ballast

Site Measurement and Verification Report

Site Number 3

Bellflower Parking Structure

9951 Flower Street, Bellflower

SCE Account 3-000-5847-64

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	14,507 kWh
Contractor's As-Built Estimate	14,577 kWh
<i>Ex-Ante</i> Evaluation	35,907 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	52,717 kWh

Site Description

The parking structure is located behind the public library and city hall. It is a three-level, open concrete structure. Southern California Edison supplies the facility at 480Y/277 volts.

The lights were all off at the time of the first inspection. It is assumed that they are on timers or photocells.

Spreadsheet Errors

There were no spreadsheet errors. Everything was accurate when compared with the audit spreadsheet.

Preliminary Site Visit

The site was visited on February 19, 2003. During the preliminary walk through the lamps found in the parking areas were 95-watt lamps as specified in the spreadsheet. In the stairwell areas are F40T12 fixtures as stated in the preliminary audit. Older style exit signs were present as noted in the preliminary. Lamp counts were verified, and ballast and lamp type were verified by opening a fixture.

Post-Retrofit Audit

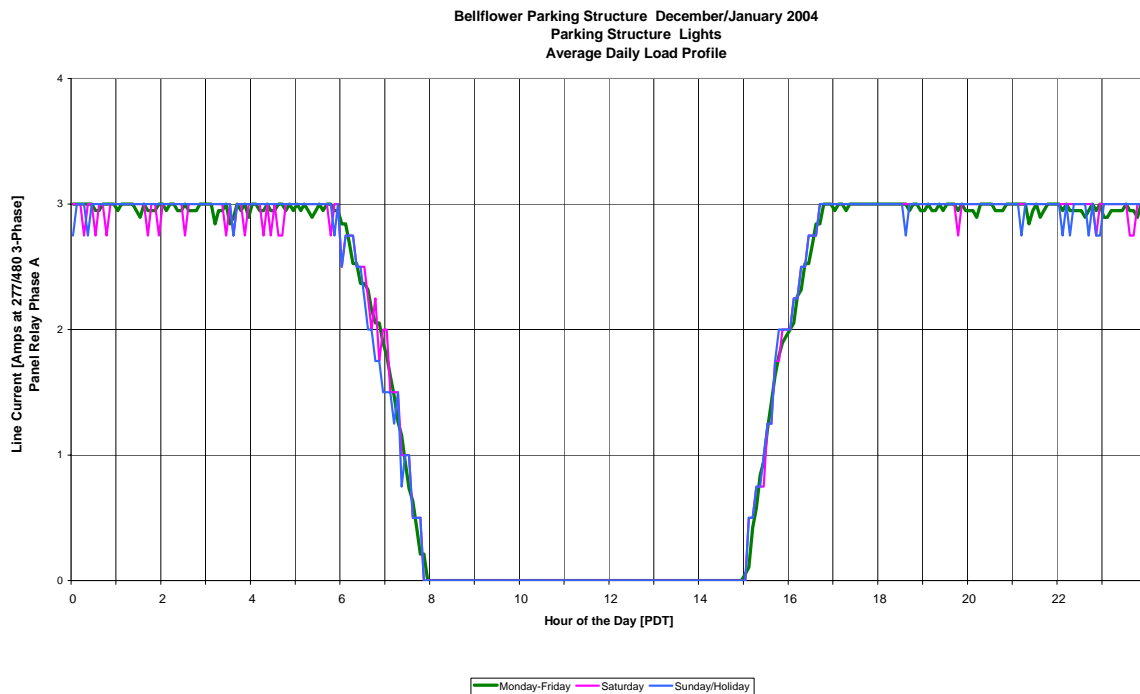
The site was again visited on December 17, 2003. We specifically re-verified the observations noted during the preliminary site visit. One discrepancy found in the contractor as-built spreadsheet is the lamp type for the existing fixtures. It is written as an F96T12 60W lamp when it is actually a high output lamp of 95W. This wattage change was highlighted in pink on the spreadsheet. Correcting this error will result in a greater energy savings.

Metered Operating Hours

Parking Structure. In order to verify operating hours of the facility, one datalogger was installed in the relay panel from the main timer. The datalogger in the relay panel measured the B phase of relay A, relay B, relay D, and relay E.

The load profile shows that the parking lights were on for about 15.2 hours each day, gradually shutting off at dawn and turning on at dusk. The full load equivalent operating time would be 5,544 hours per year if this operation remained constant throughout the year. However, the measurements were taken during December when nighttime hours are longer with approximately 14.1 hours between sunset and sunrise. The lights on average therefore run approximately 1.1 hours in addition to sunset-to-sunrise, or 13.1 hours per year. This is the equivalent of 4,782 hours per year.

The graph below also shows that the lights are turn on during the early evening and stay on until morning.



Operating hour values in the spreadsheets were changed to 4,782 in accordance with our metering discoveries. The contractor used the standard 4,380 operating hours, which did not account for the extra daylight operation. This value was highlighted in gold.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

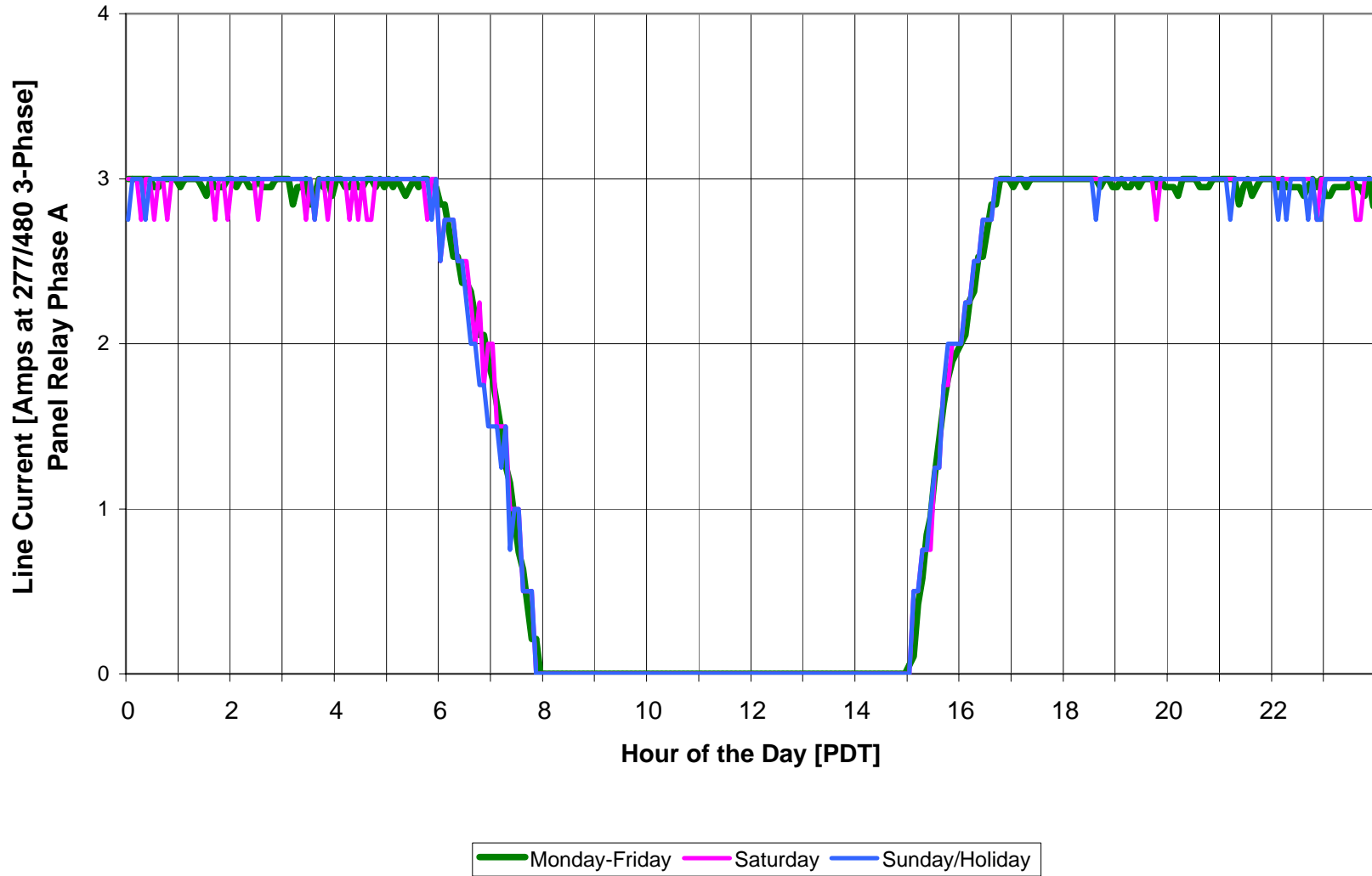
Bellflower Parking Structure Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	207	14,507	208	14,577	35,907	52,717
Inc to CFL						
Total	207	14,507	208	14,577	35,907	52,717

The contractor’s savings estimate is significantly lower than both the *ex-ante* and *ex-post* savings primarily because they assumed energy-saver lamps had existed while in fact they were high-output lamps. The slightly higher operating hours discovered also contributed to the increased savings.

At many sites, the official *ex-ante* savings were either high or low because the *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program, and fixture type and operating hour variation contributes to the average. At most of those sites, our *ex-post* estimates tend to be similar to both the county’s and the contractor’s estimates. At this site, however, our *ex-post* calculation is similar to the higher *ex-ante* calculation because the pre-retrofit fixture type had a much higher consumption than the fixture type originally assumed.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

Bellflower Parking Structure December/January 2004
Parking Structure Lights
Average Daily Load Profile



Contractor As-Built Savings
03. Bellflower Parking Structure

Contractor As-Built Savings																								
03. Bellflower Parking Structure																								
Existing Fixtures												New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
3	Parking	ELED2/1	Exit	1	LED Exit Sign	1	2	0.002	8760	17.52	None	NO CHANGE	ELED2/1		1	NO CHANGE		2	0.002	0.0	0.000	0		
																Total Exits	0				0.000	0		
2	Parking	F81ES	Wrap	1	1x8, 1 lamp F96 60W, ES ballast, Vapor Tight	104	75	7.8	4380	34,164.00	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	104	59	6.136	26,875.7	1.664	7,288		
4	Locked Area - NO ACCESS electrical room	F81ES	Wrap	1	1x8, 1 lamp F96 60W, ES ballast, Vapor Tight	1	75	0.075	4380	328.50	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	1	59	0.059	258.4	0.016	70		
5	Level 2	F81ES	Wrap	1	1x8, 1 lamp F96 60W, ES ballast, Vapor Tight	44	75	3.3	4380	14,454.00	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	44	59	2.596	11,370.5	0.704	3,084		
6	Level 3	F81ES	Wrap	1	1x8, 1 lamp F96 60W, ES ballast, Vapor Tight	59	75	4.425	4380	19,381.50	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	59	59	3.481	15,246.8	0.944	4,135		
																Total T-12 to T-8	208				3.328	14,577		
Total						209		15.602		68,345.52			Total						208		12.27	53,751.4	3.328	14,577

vendors number if different from calculated **14,594**

Aloha Systems Measured Savings
03. Bellflower Parking Structure

Aloha Systems Measured Savings 03. Bellflower Parking Structure																						
		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
3	Parking	ELED2/1	Exit	1	LED Exit Sign	0	2	0.000	8,760	0	None	NO CHANGE	ELED2/1		1	NO CHANGE	0	2	0.000	0	0.000	0
																Total Exits	0				0.000	0
1	Level 1A																					
2	Parking	F81EHS	Wrap	1	1x8, 1 lamp F96 95W, ES ballast, HO	104	112	11.648	4,782	55,701	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	104	59	6.136	29,342	5.512	26,358
4	Locked Area - NO ACCESS electrical room	F81EHS	Wrap	1	1x8, 1 lamp F96 95W, ES ballast, HO	1	112	0.112	4,782	536	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	1	59	0.059	282	0.053	253
5	Level 2	F81EHS	Wrap	1	1x8, 1 lamp F96 95W, ES ballast, HO	44	112	4.928	4,782	23,566	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	44	59	2.596	12,414	2.332	11,152
6	Level 3	F81EHS	Wrap	1	1x8, 1 lamp F96 95W, ES ballast, HO	59	112	6.608	4,782	31,599	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 1 lamp electronic ballast, conversion kit	59	59	3.481	16,646	3.127	14,953
																Total T12-T8	208				11.024	52,717
Total						208		23.296		111,401	Total						208		12.272	58,685	11.024	52,717

Bellflower Parking Structure – 9951 Flower Street



Bellflower Parking Structure



8-foot Fluorescent Fixtures



Bellflower Parking Structure



T12 Fluorescent HO 95-Watt Lamp



Lighting Relay Panel with Data Logger



Panel A

Site Measurement and Verification Report

Site Number 4

Los Angeles Superior Court Warehouse

270 W. Duarte Boulevard, Monrovia

SCE Account 3-009-9447-57

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	13,431 kWh
Contractor's As-Built Estimate	13,571 kWh
<i>Ex-Ante</i> Evaluation	44,163 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	14,030 kWh

Site Description

This is a single one-story building with a storage mezzanine above parts of the warehouse. It is a warehouse used to store supplies and office furniture. This location has a couple small offices. It also has four enclosed storage/operations departments that were dry-walled off in the warehouse area. Southern California Edison supplies the facility at 208/120 volts three-phase.

The building is operational Monday-Friday from 7:00 a.m. to 5:00 p.m., and closed Saturdays and Sundays. All lights were on at the time of the audit

Preliminary Site Visit

The site was visited on Thursday March 27, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. All 8-foot fixtures had 60W bulbs and MagneTek "Watt Reducer" ballasts. All observed 4-foot fixtures had MagneTek "Watt Reducer" ballasts. However, the bulbs were 40W standard bulbs rather than 34W energy-saver bulbs as had been assumed in the spreadsheet. All of the recessed 2x4-foot fixtures have two lamps. Due to the outdated spreadsheet and changes made in the warehouse, fixture count varied from the spreadsheet. Exact numbers of fixtures will be verified after installation.

Two spreadsheet errors were found. For all fixtures represented by the fixture code F42EE were changed to F42SE. Watts per fixture were changed accordingly from 72 watts to 86 watts. These changes were highlighted in lavender and resulted in an increased estimate of energy savings from the retrofit.

Post-Retrofit Audit

The site was again visited on December 29, 2003. We specifically re-verified the observations noted during the preliminary site visit. All warehouse lights were on during

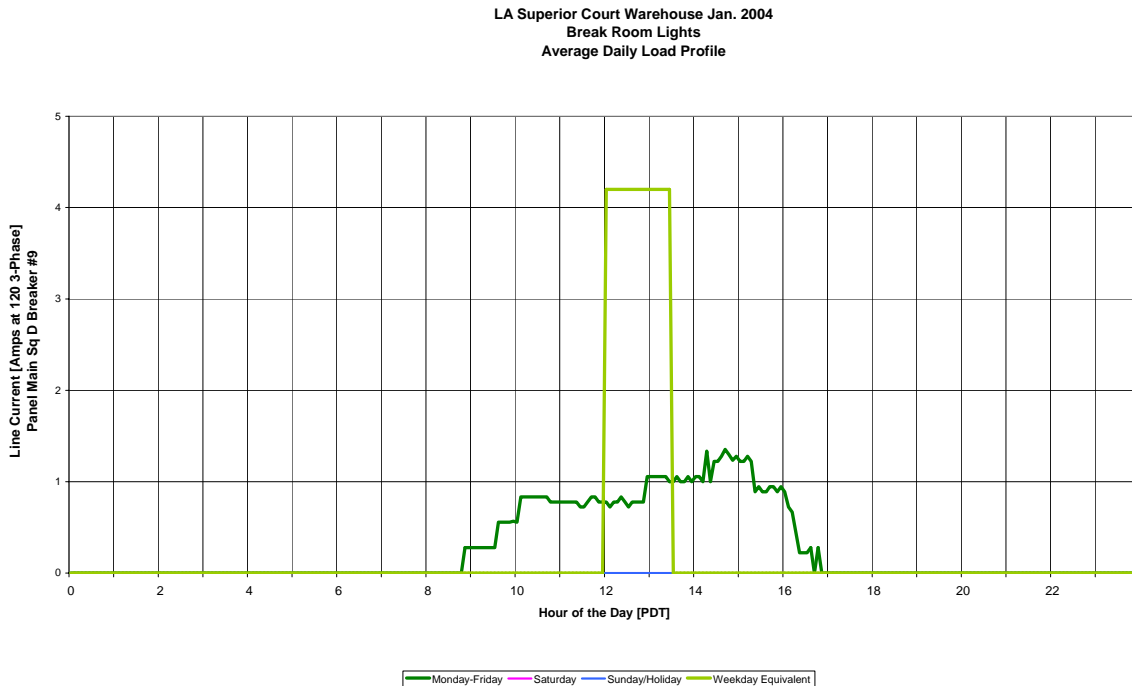
the audit. Offices were occupied but the lights remained off in three of the four offices. Storage lights and mezzanine lights were also off during the visit.

Metered Operating Hours

Dataloggers were installed at various areas of the building to verify hours of operation. The areas that were monitored include the break room and the warehouse. The following load profiles depict the average daily operation of these areas.

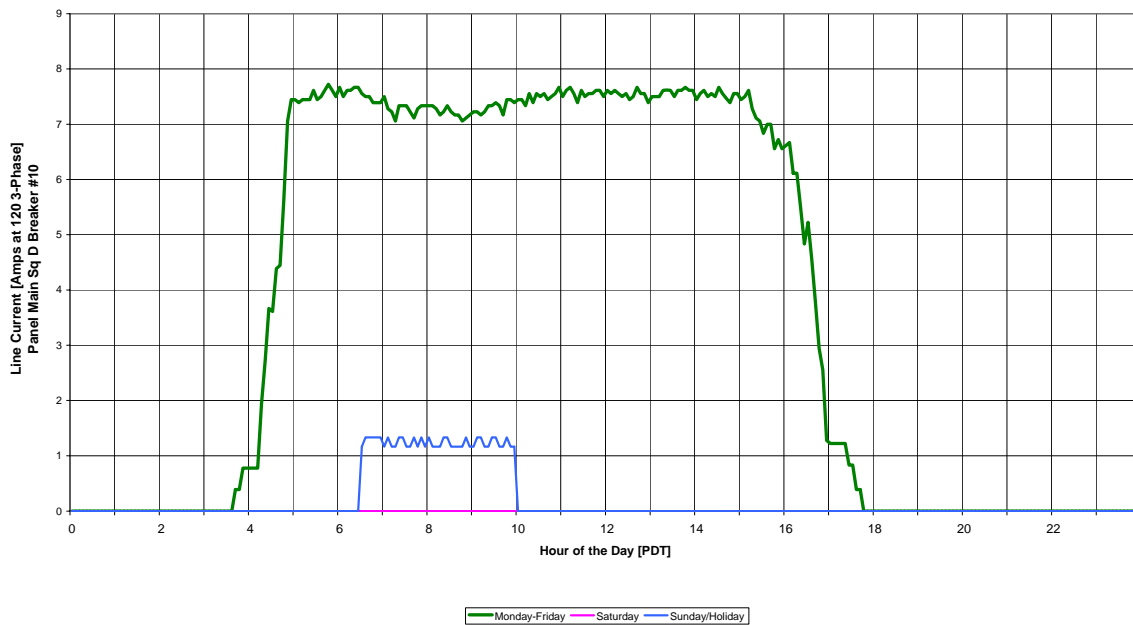
Break Room: The load profile below represents the break room. The lights are used only sporadically during weekdays. There is no consistent time when they are used, which is why the load profile never reaches the “lights-on” load of 4.2 amps. The full load equivalent operating time is 344 hours per year. The contractor used an operating time of 1040 hours per year.

This value will also be used for the kitchen and similar areas.



Warehouse: The load profile below represents the warehouse. The load consists of 26 four-lamp fixtures. The graph below shows that the lights are on from about 5:00 a.m. until about 5:00 p.m. during the week. The lights are off during the weekend and holidays except for the morning of Martin Luther King Day (January 19, 2004). Given these hours, the full load equivalent operating time is 2,987 hours per year. The contractor used an operating time of 2600 hours per year.

LA Superior Court Warehouse Jan. 2004
Main Warehouse Lights
Average Daily Load Profile



During our visit, one of the four offices had its lights on, even though more than one was being used at the time. We will use one-fourth of the warehouse operating time, or 747 hours per year, to estimate the offices, workshops, and mezzanine. The contractor used 2,600 for the offices, 1,040 for the workshops, and 520 for the mezzanine.

Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in gold. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

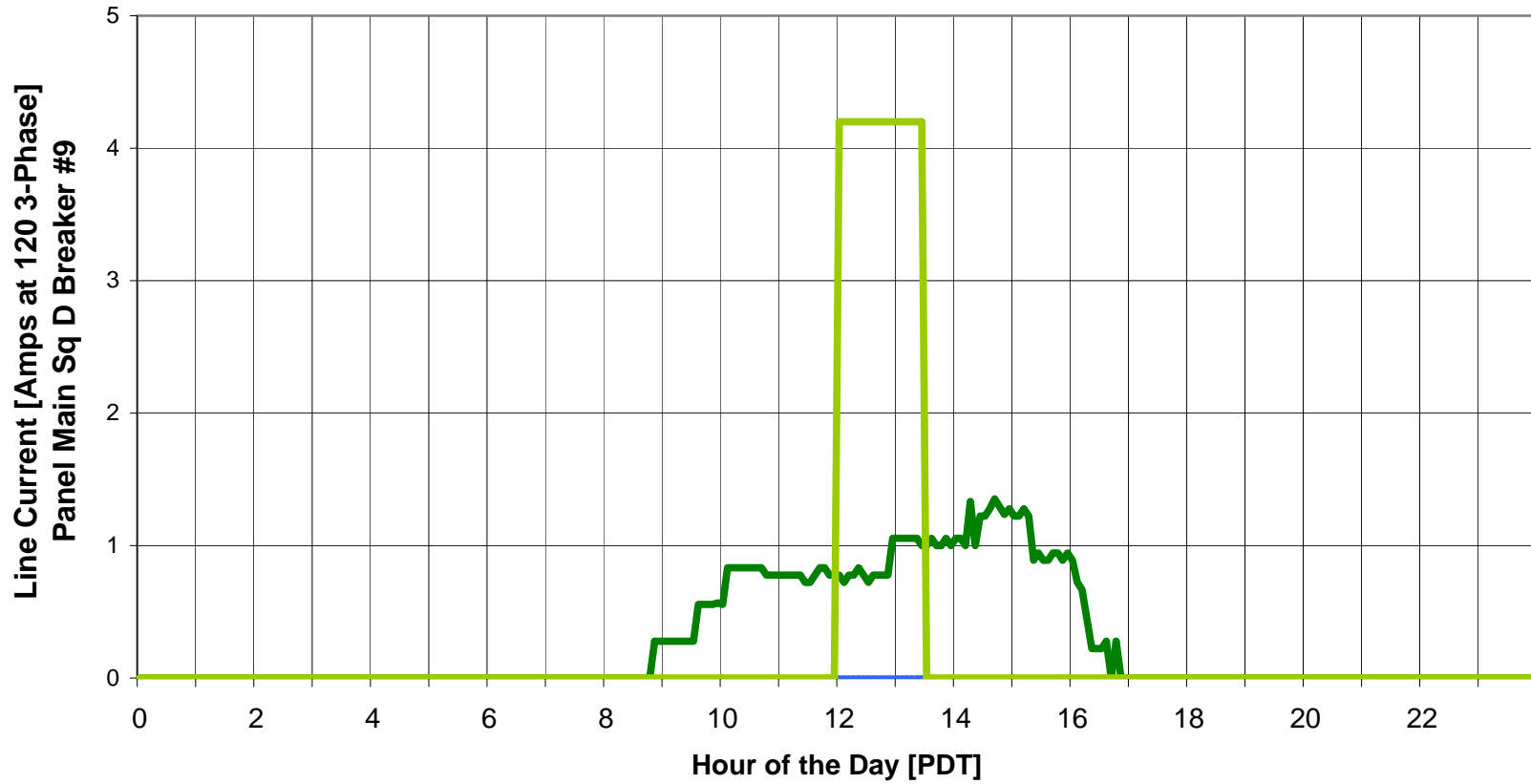
Los Angeles Superior Court Warehouse Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	252	13,327	254	13,467	43,848	13,881
Inc to CFL	2	104	2	104	316	149
Total	254	13,431	256	13,571	44,163	14,030

The official *ex-ante* savings estimate for this site is much higher than either the proposed, as-built, or *ex-post* estimates because the generic operating hours numbers used in the CPUC spreadsheet for all building sites is higher than what occurs at this site and the because generic wattage reduction numbers are higher than the particular fixture retrofits at this site. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county’s proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

The contractor’s savings estimate is approximately the same as our metered *ex-post* savings estimate. The metered operating hours were higher than the warehouse assumption but lower than the assumption in other areas. The increased savings due to replacing higher-wattage bulbs also contributed to our estimate being higher than the contractor’s estimate.

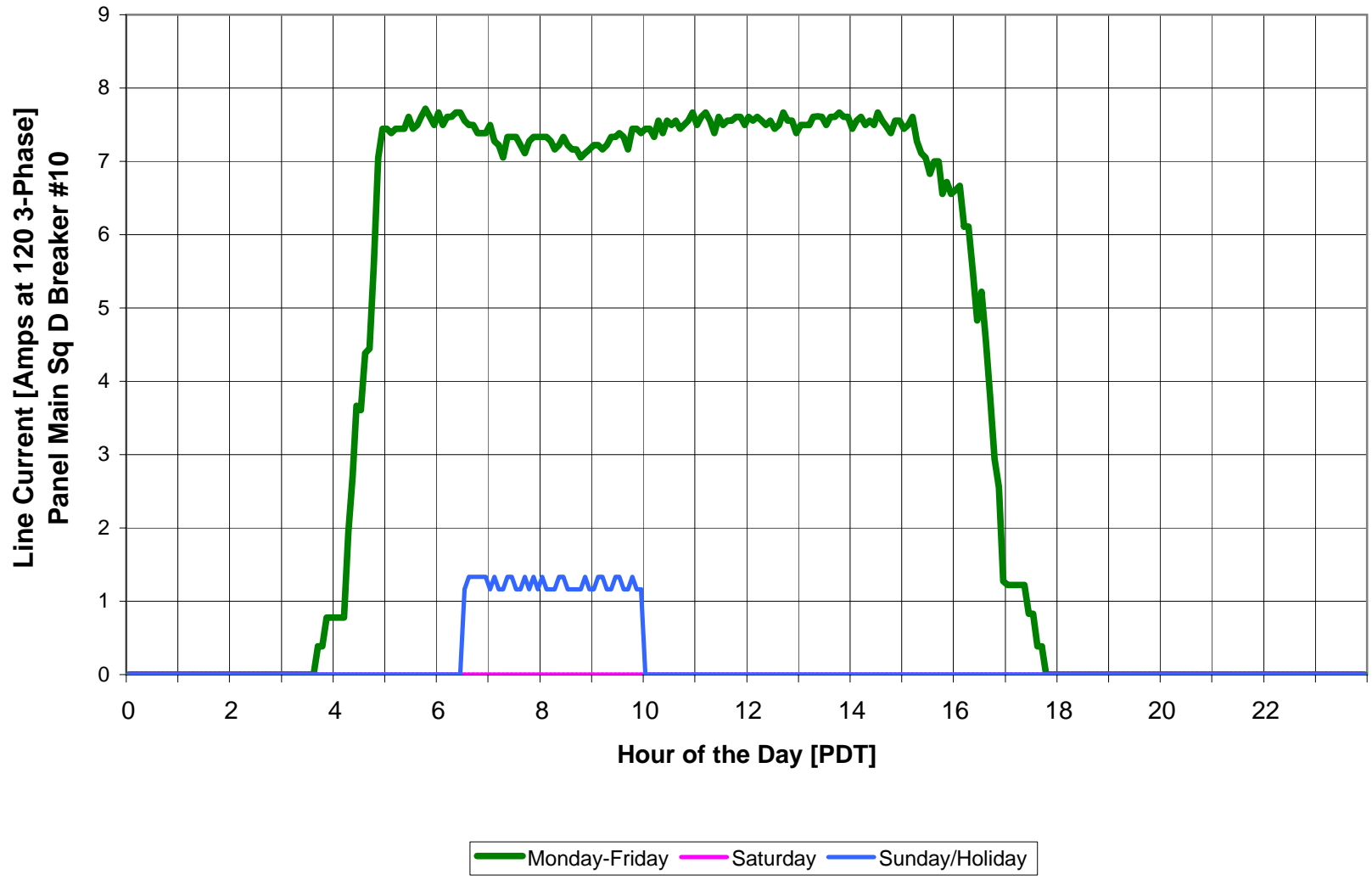
The full-page load profiles and detailed fixture spreadsheets follow this narrative.

LA Superior Court Warehouse Jan. 2004
Break Room Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday Weekday Equivalent

LA Superior Court Warehouse Jan. 2004
Main Warehouse Lights
Average Daily Load Profile



Contractor As-Built Savings
04. Los Angeles Superior Court Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
1	OFFICE - 14	F42EE	T34RF2	2	TROFFER	2	72	0.144	2600	374	S	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	234	0.054	140	
2	OFFICE - 12	F42EE	T34RF2	2	TROFFER	4	72	0.288	2600	749	S	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	468	0.108	281	
3	OFFICE	F42EE	T34RF2	2	TROFFER	4	72	0.288	2600	749	S	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	468	0.108	281	
4	OFFICE	F42EE	T34RF2	2	TROFFER	3	72	0.216	2600	562	S	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	351	0.081	211	
5	OFFICE CONT	F42EE	T34RF2	2	TROFFER	2	72	0.144	2600	374	S	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	234	0.054	140	
6	KITCHEN	F42EE	T34RF2	2	TROFFER	1	72	0.072	1040	75	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	47	0.027	28	
9	JANITOR	F42EE	S34CF2	2	OPEN STRIP	1	72	0.072	1040	75	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	47	0.027	28	
10	BREAK ROOM	F42EE	T34RF2	2	TROFFER	8	72	0.576	1040	599	2S	RETROFIT	F42ILL-R(G3)		2	LBO	8	45	0.360	374	0.216	225	
11	BREAK ROOM	F42EE	T34RF2	2	TROFFER	32	72	2.304	1040	2,396	2S	RETROFIT	F42ILL-R(G3)		2	LBO	32	45	1.440	1,498	0.864	899	
12	RNITURE STORA	F42EE	T34RF2	2	TROFFER	6	72	0.432	1040	449	2S	RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	281	0.162	168	
13	RNITURE STORA	F42EE	T34RF2	2	TROFFER	24	72	1.728	1040	1,797	2S	RETROFIT	F42ILL-R(G3)		2	LBO	24	45	1.080	1,123	0.648	674	
14	MAINTENACE	F42EE	T34RF2	2	TROFFER	3	72	0.216	1040	225	2S	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	140	0.081	84	
15	MAINTENACE	F42EE	T34RF2	2	TROFFER	12	72	0.864	1040	899	2S	RETROFIT	F42ILL-R(G3)		2	LBO	12	45	0.540	562	0.324	337	

Contractor As-Built Savings
04. Los Angeles Superior Court Warehouse

		Existing Fixtures										New Fixtures										Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
16	CARPENTER	F42EE	S34CF2	2	OPEN STRIP	4	72	0.288	1040	300	2S	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	187	0.108	112		
17	CARPENTER	F82EE	S96CF2	2	OPEN STRIP	12	123	1.476	1040	1,535	2S	RETROFIT	F44ILL-R(G3)		4	FIT KIT	12	88	1.056	1,098	0.420	437		
18	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	94	123	11.562	2600	30,061	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	94	88	8.272	21,507	3.290	8,554		
19	WAREHOUSE-MEZZ	F82EE	S96CF2	2	OPEN STRIP	40	123	4.920	520	2,558	S	RETROFIT	F44ILL-R(G3)		4	FIT KIT	40	88	3.520	1,830	1.400	728		
	OFFICE	F42EE	T34RF2	2	TROFFER	2	72	0.144	2600	374						LBO	2	45	0.090	234	0.054	140		
																Total T12-T8	254				8.026	13,467		
7	RESTROOM	I60/2	Dr60CI2	2	INCAN DRUM	1	120	0.120	520	62	S	RETROFIT	CFQ15/1		1	TCP CSI	1	20	0.020	10	0.100	52		
8	RESTROOM	I60/2	Dr60CI2	2	INCAN DRUM	1	120	0.120	520	62	S	RETROFIT	CFQ15/1		1	TCP CSI	1	20	0.020	10	0.100	52		
																Total INCAN	2				0.200	104		
Total						256		25.974		44,276			Total						256		17.748		8.226	13,571

Aloha Systems Measured Savings
04. Los Angeles Superior Court Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
1	OFFICE - 14	F42SE	T34RF2	2	TROFFER	2	86	0.172	747	128	S	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	67	0.082	61	
2	OFFICE - 12	F42SE	T34RF2	2	TROFFER	4	86	0.344	747	257	S	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	134	0.164	123	
3	OFFICE	F42SE	T34RF2	2	TROFFER	4	86	0.344	747	257	S	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	134	0.164	123	
4	OFFICE	F42SE	T34RF2	2	TROFFER	3	86	0.258	747	193	S	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	101	0.123	92	
5	OFFICE CONT	F42SE	T34RF2	2	TROFFER	2	86	0.172	747	128	S	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	67	0.082	61	
6	KITCHEN	F42SE	T34RF2	2	TROFFER	1	86	0.086	382	33	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	17	0.041	16	
9	JANITOR	F42SE	S34CF2	2	OPEN STRIP	1	86	0.086	747	64	S	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	34	0.041	31	
10	BREAK ROOM	F42SE	T34RF2	2	TROFFER	8	86	0.688	382	263	2S	RETROFIT	F42ILL-R(G3)		2	LBO	8	45	0.360	138	0.328	125	
11	BREAK ROOM	F42SE	T34RF2	2	TROFFER	32	86	2.752	382	1,051	2S	RETROFIT	F42ILL-R(G3)		2	LBO	32	45	1.440	550	1.312	501	
12	RNITURE STORA	F42SE	T34RF2	2	TROFFER	6	86	0.516	747	385	2S	RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	202	0.246	184	
13	RNITURE STORA	F42SE	T34RF2	2	TROFFER	24	86	2.064	747	1,542	2S	RETROFIT	F42ILL-R(G3)		2	LBO	24	45	1.080	807	0.984	735	
14	MAINTENACE	F42SE	T34RF2	2	TROFFER	3	86	0.258	747	193	2S	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	101	0.123	92	
15	MAINTENACE	F42SE	T34RF2	2	TROFFER	12	86	1.032	747	771	2S	RETROFIT	F42ILL-R(G3)		2	LBO	12	45	0.540	403	0.492	368	

Aloha Systems Measured Savings
04. Los Angeles Superior Court Warehouse

		Existing Fixtures										New Fixtures										Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
16	CARPENTER	F42SE	S34CF2	2	OPEN STRIP	4	86	0.344	747	257	2S	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	134	0.164	123		
17	CARPENTER	F82EE	S96CF2	2	OPEN STRIP	12	123	1.476	747	1,103	2S	RETROFIT	F44ILL-R(G3)		4	FIT KIT	12	88	1.056	789	0.420	314		
18	WAREHOUSE	F82EE	S96CF2	2	OPEN STRIP	94	123	11.562	2987	34,536	CB	RETROFIT	F44ILL-R(G3)		4	FIT KIT	94	88	8.272	24,708	3.290	9,827		
19	WAREHOUSE-MEZZ	F82EE	S96CF2	2	OPEN STRIP	40	123	4.920	747	3,675	S	RETROFIT	F44ILL-R(G3)		4	FIT KIT	40	88	3.520	2,629	1.400	1,046		
	OFFICE	F42SE	T34RF2	2	TROFFER	2	86	0.172	747	128						LBO	2	45	0.090	67	0.082	61		
																Total T12-T8	254			0	9.538	13,881		
7	RESTROOM	I60/2	Dr60CI2	2	INCAN DRUM	1	120	0.120	747	90	S	RETROFIT	CFQ15/1		1	TCP CSI	1	20	0.020	15	0.100	75		
8	RESTROOM	I60/2	Dr60CI2	2	INCAN DRUM	1	120	0.120	747	90	S	RETROFIT	CFQ15/1		1	TCP CSI	1	20	0.020	15	0.100	75		
																Total INCAN	2				0.200	149		
Total						256		27.486		45,144			Total						256		17.748	31,114	9.738	14,030

LA Superior Court Warehouse – 250 W. Duarte Blvd., Monrovia



Warehouse Lighting Fixture Row



Break Room Lighting Fixtures



More Storage Room Lighting Fixtures



F96T-12 Ballast



F40T-12 Ballast



Another F40T-12 Ballast

Site Measurement and Verification Report

Site Number 5

DCSS Senior Center Willowbrook

12915 S. Jarvis Avenue, Los Angeles

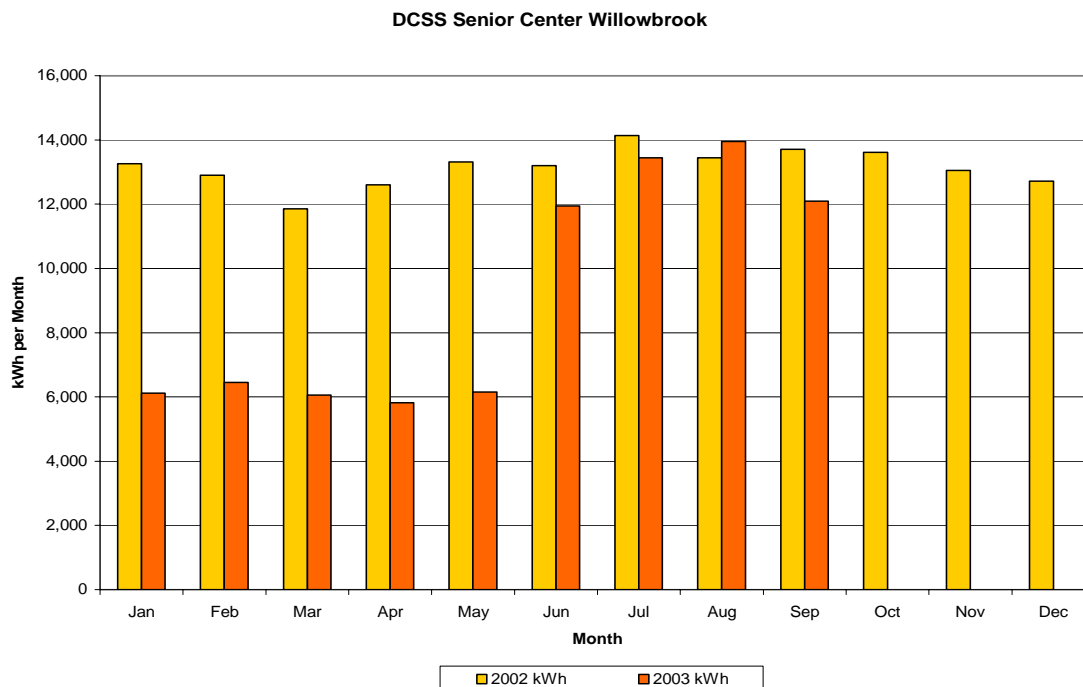
SCE Account 3-002-9890-07

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	25,124 kWh
Contractor's As-Built Estimate	32,472 kWh
<i>Ex-Ante</i> Evaluation	44,650 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	27,507 kWh

Site Description

This facility is a single story facility that is used as an activity center for senior citizens. It has a large auditorium area, a game center where there are tables and pool tables, a computer-learning center with ten or more computers, and various offices. The equipment room is located in a room off of one of the halls. Southern California Edison supplies the facility at 120/208 volts through meter PO264-017068. Its annual energy consumption in 2002 was 157,800 kWh, and its peak demand was 61 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The facility is open Monday through Friday from 8:00 a.m. to 5:00 p.m. It is closed Saturdays and Sundays.



Preliminary Site Visit

The site was visited on March 6, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. We surveyed existing ballasts in the fixtures and found that 24% of the 4-lamp fixtures had “energy-saver” magnetic ballasts which 76% had standard magnetic ballasts. We changed the existing fixture wattage in the spreadsheet to 159W, which is a ratio of the 164W value for standard ballasts and the 144W value for energy-saver ballasts. This change was highlighted in magenta.

Post-Retrofit Audit

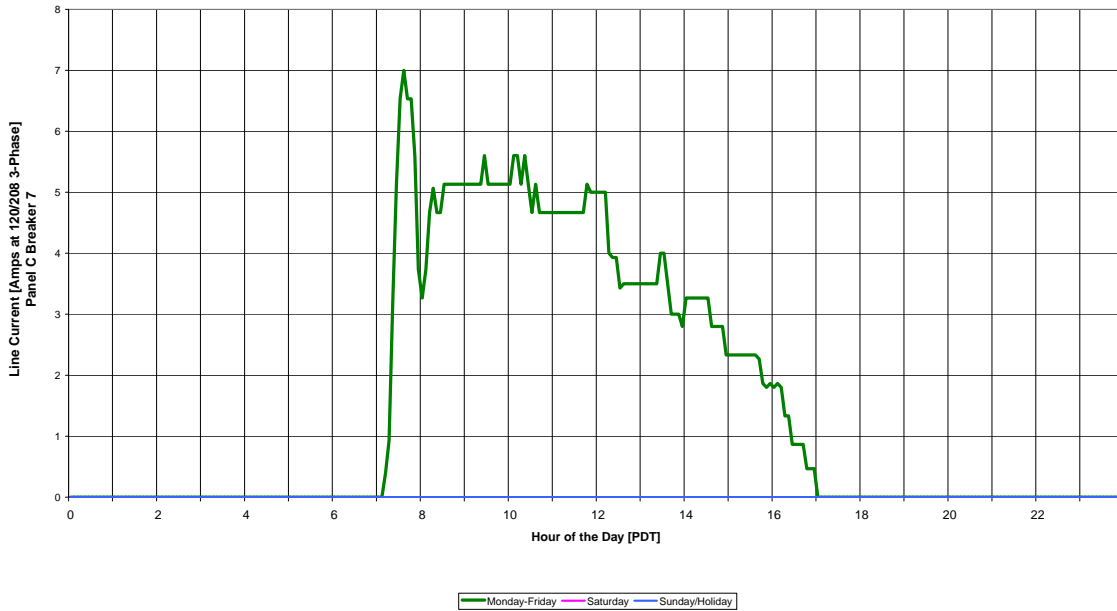
The site was again visited on October 21, 2003. We specifically re-verified the observations noted during the preliminary site visit. All the completed retrofits were verified and were correct. During our visit we physically counted five led exit signs.

Metered Operating Hours

During our visit we installed four dataloggers to verify the hours of operation in certain areas of the building. We placed dataloggers to collect information on the hallway lights, two game/activity rooms, and the auditorium. We chose these areas because they represent the most lighting fixtures.

Auditorium: The load profile on the following page represents auditorium lights. The lights are on from 7:30 a.m. until 5:00 p.m., but not consistently. There is more use during the morning than the afternoon. The lights operate an average of about 5.3 hours per weekday, amounting to 1,335 hours per year. The contractor as built spreadsheet claims 3,120 operating hours per year.

Willowbrook Senior Center October/November 2003
 Auditorium Lights
 Average Daily Load Profile

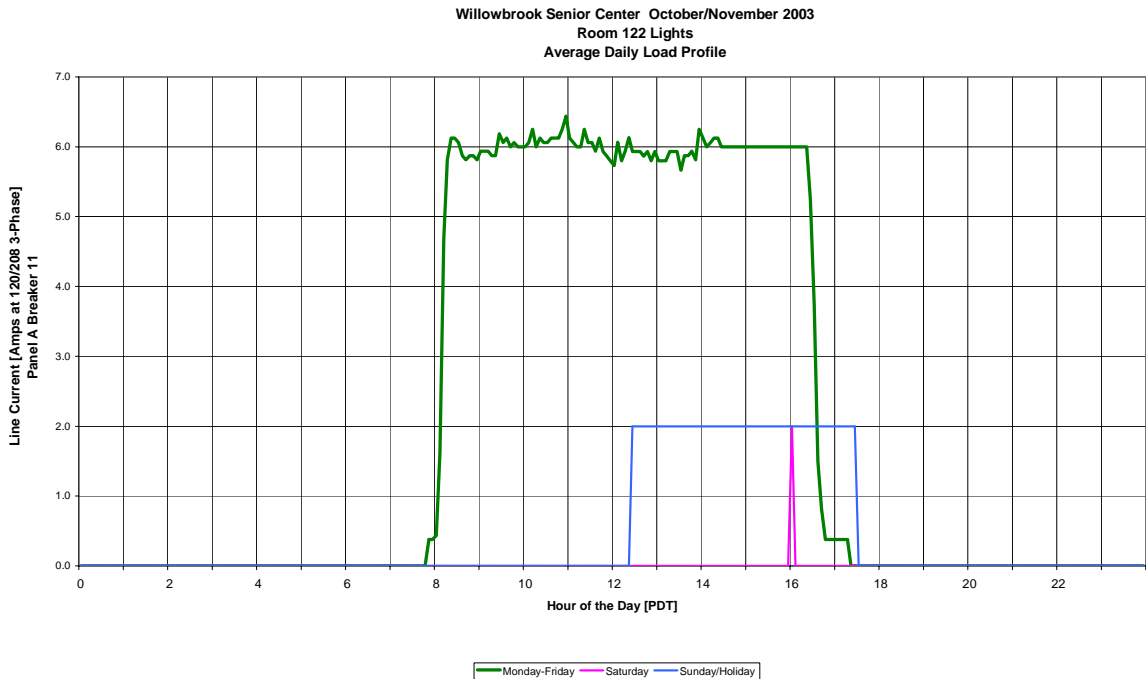
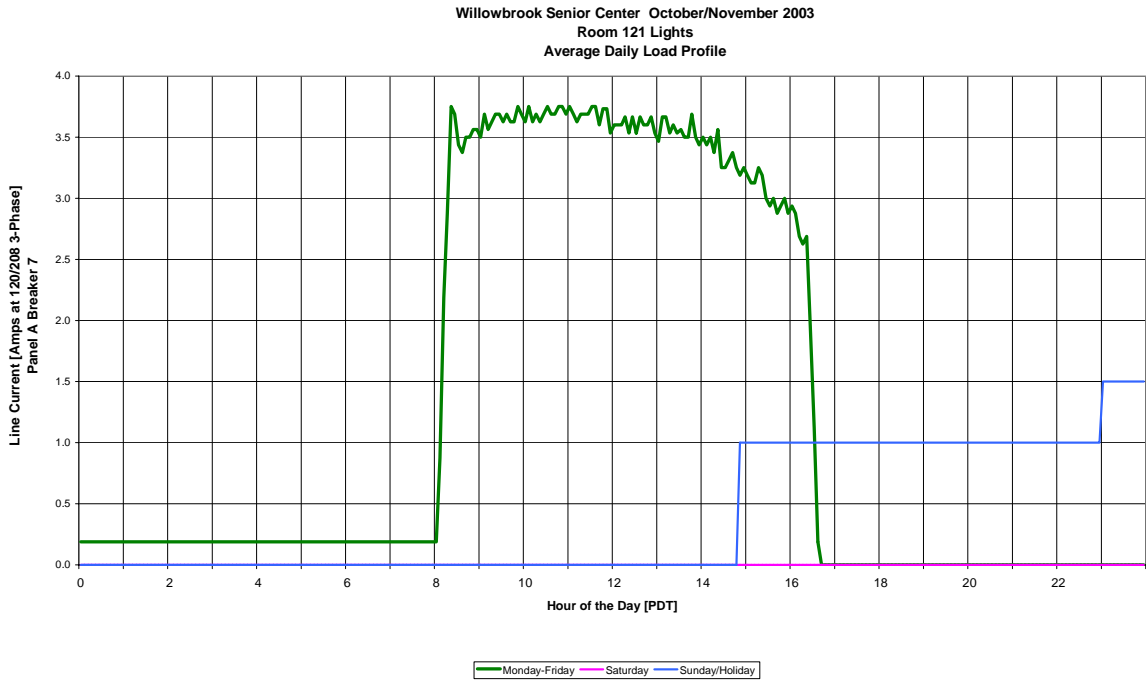


Hallway: The load profile below represents hallway lights. During the weekday the lights are usually on from about 6:30 a.m. until 5:00 p.m. They were occasionally left on during weekends and an additional load recorded on some afternoons probably represents an unidentified light or appliance also on this circuit. The load profile represents an equivalent lighting operating time of 3,150 hours per year. This is very similar to the contractor's assumption of 3,120 hours per year.

Willowbrook Senior Center October/November 2003
 Hallway Lights
 Average Daily Load Profile



Game Room: The two load profiles below represent adjacent rooms that make up the game room. During the weekdays the lights are on from about 8:00 a.m. until 4:30 p.m. Occasional weekend use was noted; probably from accidentally leaving lights on. The equivalent annual operating hours for the two similar load profiles are 2,300 (Room 121) and 2,254 (Room 122). We averaged these values to 2,277 and used that value for both of these rooms as well as other similar activity rooms. The contractor as-built spreadsheet used 3,120 operating hours per year for these rooms.



The remainder of the facility consisted of offices, miscellaneous activity rooms, and storage areas. The contractor used 3,120 hours per year for all of these areas. We believe this is a reasonable estimate, based upon hallway-metered hours, for the office areas and some of the activity areas that were usually occupied during operating hours. We changed the storage room operating time to 720 h/yr, the exterior lighting to 4,380 h/yr, and the exit signs to 8,760 h/yr. These values were highlighted in yellow in the spreadsheet. The actual metered hours were highlighted in gold.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

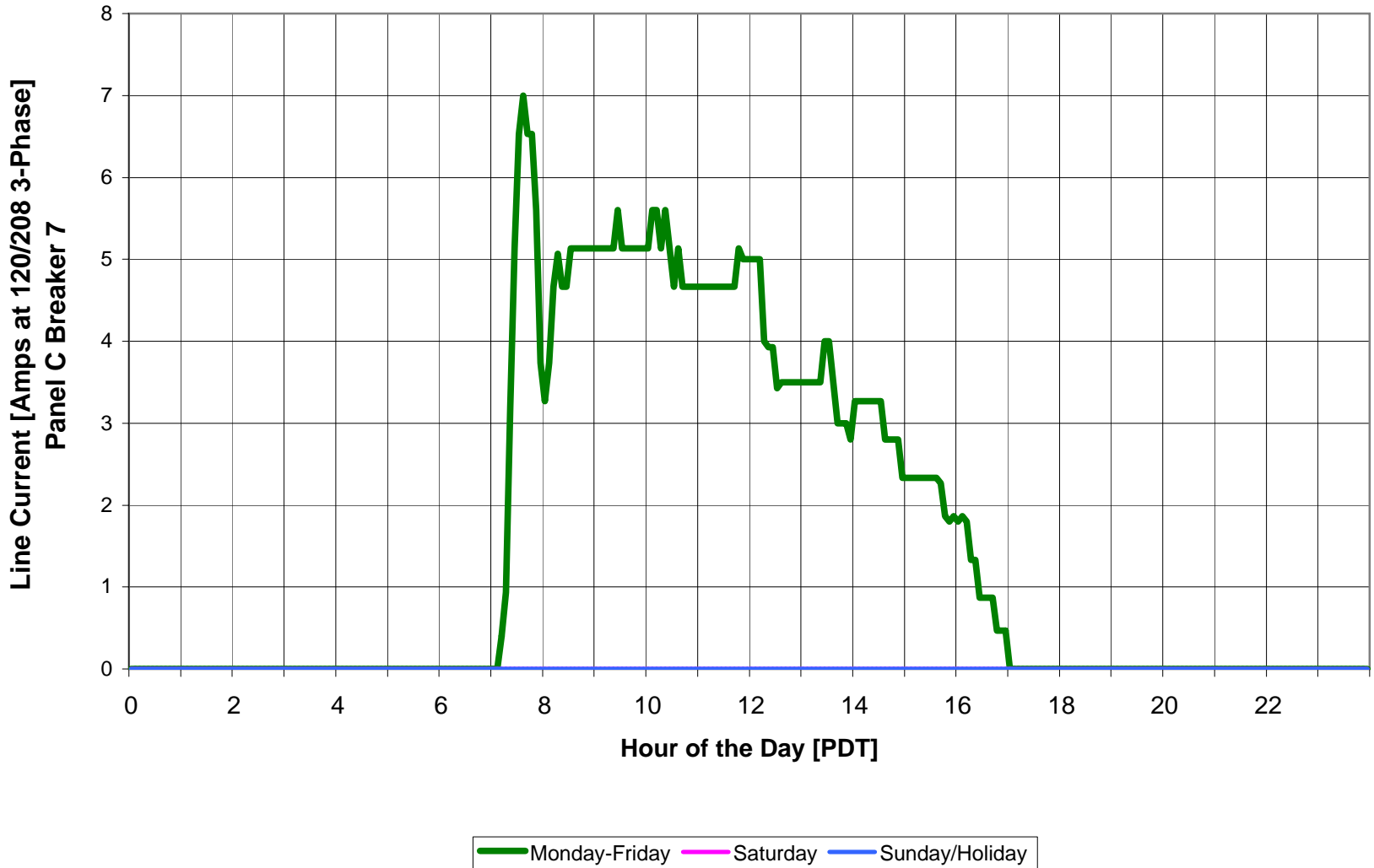
DCSS Senior Center Willowbrook Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit			4	1,161	12,319	1,629
Exit Lights	5	1,443	5	1,732	1,804	1,007
T12 to T8	143	18,632	143	22,359	24,686	18,860
Inc to CFL	39	5049	37	7,220	5,841	6,011
Total	187	25,124	189	32,472	44,650	27,507

The contractor’s savings estimate is higher than the *ex-post* savings primarily because the contractor’s general operating time assumption (3120) was not substantiated in some of the large areas. However, the higher pre-retrofit fixture wattages tended to compensate for this decrease, which explains why our ex-post estimate is higher than the county’s original estimate but lower than the contractor’s estimate.

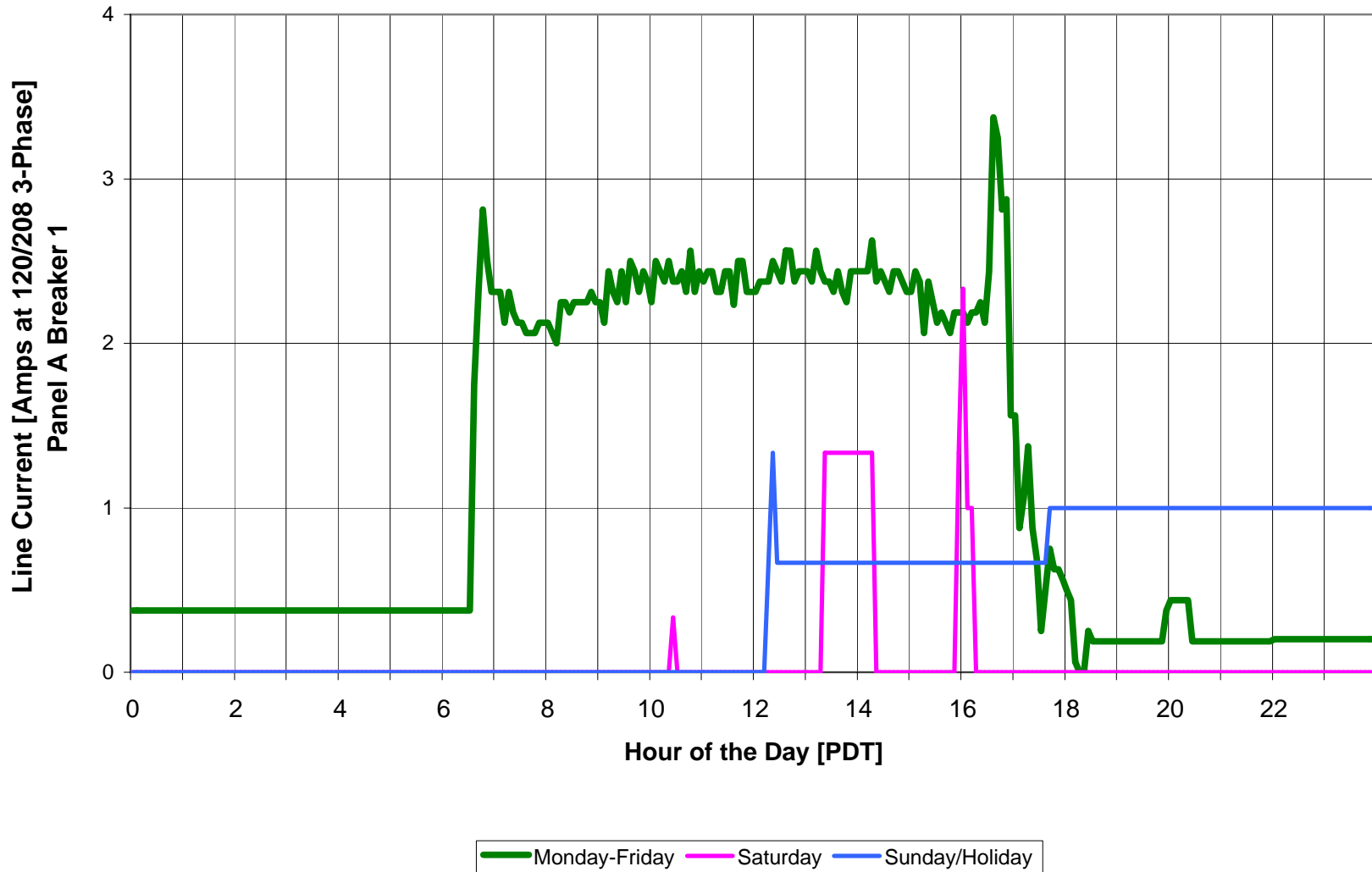
The official *ex-ante* savings estimate for this site is higher than either the proposed, as-built, or *ex-post* estimates because the average operating hours and fixture demand reduction values assumed in the CPUC spreadsheet for all building sites are higher than those observed at this site. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county's proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

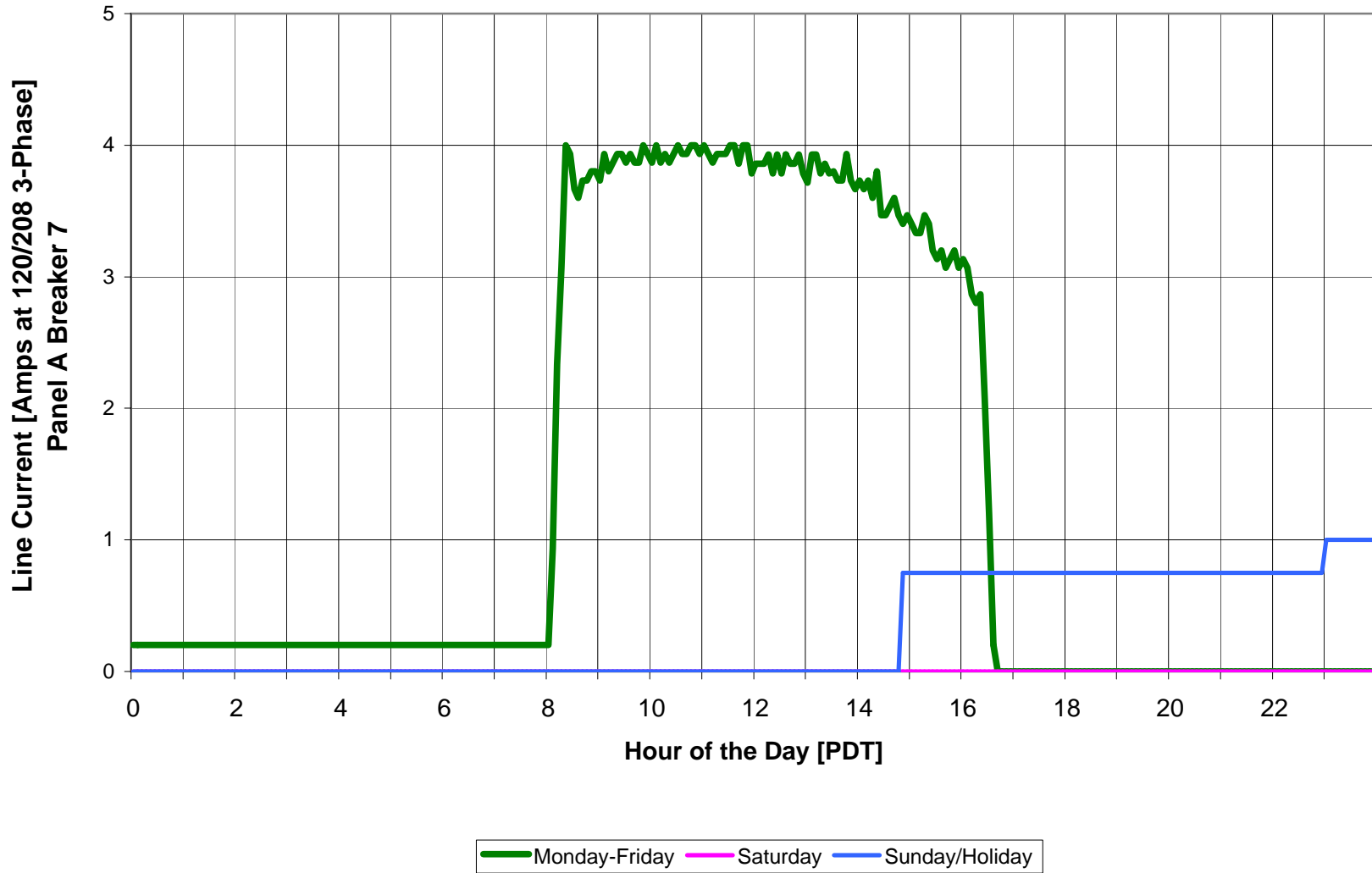
Willowbrook Senior Center October/November 2003
Auditorium Lights
Average Daily Load Profile



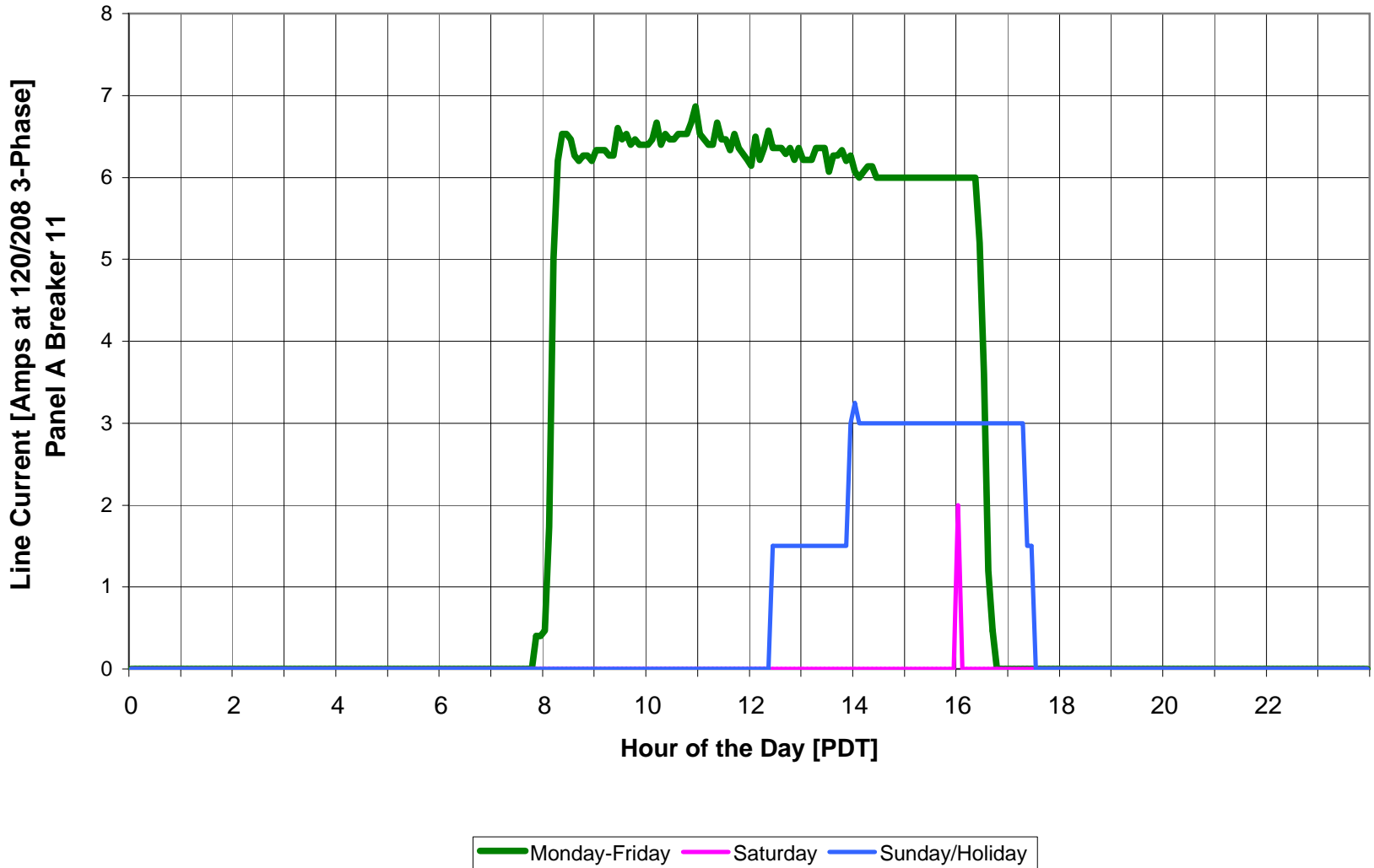
Willowbrook Senior Center October/November 2003
Hallway Lights
Average Daily Load Profile



Willowbrook Senior Center October/November 2003
Room 121 Lights
Average Daily Load Profile



Willowbrook Senior Center October/November 2003
Room 122 Lights
Average Daily Load Profile



Contractor As-Built Savings
05. Willowbrook Senior Center

Contractor As-Built Savings																						
		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
29	Exterior W/P	HPS150/1		1	Wall Pack	4	0.188	0.752	3120	2,346				MH70/1	1	Metal Halide, (1) 70W lamp	4	0.095	0.38	1,186	0.372	1,161
																Total HID	4				0.372	1,161
30	Exit Signs	E16/2		2	Exit	5	0.120	0.6	3120	1,872				ELED2/2	2	Exit Light Emitting Diode (2) 2w lamp Dual Sided	5	0.009	0.045	140	0.555	1,732
																Total Exits	5				0.555	1,732
1	119	F44ES		4	2X4 Troffer	6	0.156	0.936	3120	2,920				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	0.1024	0.6144	1,917	0.322	1,003
2	118	F44ES		4	2X4 Troffer	6	0.156	0.936	3120	2,920				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	0.1024	0.6144	1,917	0.322	1,003
4	115	F42ES		2	Ceiling Mount	3	0.078	0.234	3120	730				2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	0.0521	0.1563	488	0.078	242
6	113	F42ES		2	Ceiling Mount	3	0.078	0.234	3120	730				2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	0.0521	0.1563	488	0.078	242
8	123	F44ES		4	2X4 Troffer	10	0.156	1.56	3120	4,867				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	10	0.1024	1.024	3,195	0.536	1,672
9	121 & 122	F44ES		4	2X4 Troffer	18	0.156	2.808	3120	8,761				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	18	0.1024	1.8432	5,751	0.965	3,010
10	Hallway	F42ES		2	Ceiling Mount	12	0.078	0.936	3120	2,920				2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	12	0.0521	0.6252	1,951	0.311	970

Contractor As-Built Savings
05. Willowbrook Senior Center

Contractor As-Built Savings																						
05. Willowbrook Senior Center																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
13	109	F44ES		4	2X4 Troffer	4	0.156	0.624	3120	1,947				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	0.1024	0.4096	1,278	0.214	669
14	Kitchen	F44ES		4	2X4 Troffer	4	0.156	0.624	3120	1,947				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	0.1024	0.4096	1,278	0.214	669
15	107	F44ES		4	2X4 Troffer	4	0.156	0.624	3120	1,947				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	0.1024	0.4096	1,278	0.214	669
16	106	F44ES		4	2X4 Troffer	6	0.156	0.936	3120	2,920				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	0.1024	0.6144	1,917	0.322	1,003
17	Auditorium	F44ES		4	2X4 Troffer	30	0.156	4.68	3120	14,602				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	30	0.1024	3.072	9,585	1.608	5,017
18	Storage	F44ES		4	2X4 Troffer	2	0.156	0.312	3120	973				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	2	0.1024	0.2048	639	0.107	334
19	Hallway	F44ES		4	2X4 Troffer	7	0.156	1.092	3120	3,407				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	7	0.1024	0.7168	2,236	0.375	1,171
20	101	F44ES		4	2X4 Troffer	10	0.156	1.56	3120	4,867				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	10	0.1024	1.024	3,195	0.536	1,672
21	Storage	F44ES		4	2X4 Troffer	6	0.156	0.936	3120	2,920				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	0.1024	0.6144	1,917	0.322	1,003
22	103	F44ES		4	2X4 Troffer	6	0.156	0.936	3120	2,920				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	0.1024	0.6144	1,917	0.322	1,003
23	104	F44ES		4	2X4 Troffer	6	0.156	0.936	3120	2,920				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	0.1024	0.6144	1,917	0.322	1,003
																Total T12-T8	143				7.166	22,359

Contractor As-Built Savings
05. Willowbrook Senior Center

Contractor As-Built Savings																								
05. Willowbrook Senior Center																								
Existing Fixtures												New Fixtures								Savings				
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year		
3	116	I100/2		2	Ceiling Mount	2	0.200	0.4	3120	1,248				CF13/2-DR	2	Compact Fluorescent, (2) 13w drum twin or quad	2	0.026	0.052	162	0.348	1,086		
5	114	I100/1		1	Ceiling Mount	1	0.100	0.1	3120	312				CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	0.033	0.033	103	0.067	209		
7	Water Heater	I150/1		1	Ceiling Mount	1	0.150	0.15	3120	468				CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	0.033	0.033	103	0.117	365		
12	Kitchen Storage	I100/2		2	Ceiling Mount	2	0.200	0.4	3120	1,248				CF13/2-DR	2	Compact Fluorescent, (2) 13w drum twin or quad	2	0.026	0.052	162	0.348	1,086		
24	Front Desk	I40/1		1	Ceiling Mount	24	0.040	0.96	3120	2,995				CFQ15/1S CW	1	Compact Fluorescent, quad (1) 15W Lamp	24	0.02	0.48	1,498	0.480	1,498		
25	Front Desk Storage	I100/1		1	Ceiling Mount	1	0.100	0.1	3120	312				CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	0.033	0.033	103	0.067	209		
26	Auditorium Storage	I100/2		2	Ceiling Mount	1	0.200	0.2	3120	624				CFQ26/1S CW	2	Compact Fluorescent, quad (1) 26W Lamp	1	0.033	0.033	103	0.167	521		
27	Under Canopy	I100/2		2	Ceiling Mount	2	0.200	0.4	3120	1,248				CF13/2-DR 1x1	2	Compact Fluorescent, (2) 13w drum twin or quad fixture	2	0.026	0.052	162	0.348	1,086		
28	Exterior	I100/1		1	Wall Pack	3	0.150	0.45	3120	1,404				CF13/2-WP	1	Compact Fluorescent, (2) 13w wall pack fixture	3	0.026	0.078	243	0.372	1,161		
																Total INCAN	37				2.314	7,220		
Total						127		25.416		79,298			Total						189				10.41	32,470

Aloha Systems Measured Savings
05. Willowbrook Senior Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.: & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
29	Exterior W/P	HPS150/1		1	Wall Pack	4	188	0.752	4380	3,294				MH70/1	1	Metal Halide, (1) 70W lamp	4	95	0.380	1,664	0.372	1,629
																Total HID	4				0.372	1,629
30	Exit Signs	E16/2		2	Exit	5	32	0.16	8760	1,402				ELED2/2	2	Exit Light Emitting Diode (2) 2w lamp Dual Sided	5	9	0.045	394	0.115	1,007
																Total Exits	5				0.115	1,007
1	119	F44EE-F44ES		4	2X4 Troffer	6	159	0.9552	3120	2,980				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.614	1,917	0.341	1,063
2	118	F44EE-F44ES		4	2X4 Troffer	6	159	0.9552	3120	2,980				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.614	1,917	0.341	1,063
4	115	F42ES		2	Ceiling Mount	3	82	0.246	3120	768				2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	52.1	0.156	488	0.090	280
6	113	F42ES		2	Ceiling Mount	3	82	0.246	3120	768				2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	52.1	0.156	488	0.090	280
8	123	F44EE-F44ES		4	2X4 Troffer	10	159	1.592	3120	4,967				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	10	102.4	1.024	3,195	0.568	1,772
9	121 & 122	F44EE-F44ES		4	2X4 Troffer	18	159	2.8656	2277	6,525				4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	18	102.4	1.843	4,197	1.022	2,328
10	Hallway	F42ES		2	Ceiling Mount	12	82	0.984	3150	3,100				2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	12	52.1	0.625	1,969	0.359	1,130

Aloha Systems Measured Savings
05. Willowbrook Senior Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
13	109	F44EE-F44ES		4	2X4 Troffer	4	159	0.6368	3120	1,987				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.410	1,278	0.227	709
14	Kitchen	F44EE-F44ES		4	2X4 Troffer	4	159	0.6368	3120	1,987				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.410	1,278	0.227	709
15	107	F44EE-F44ES		4	2X4 Troffer	4	159	0.6368	3120	1,987				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.410	1,278	0.227	709
16	106	F44EE-F44ES		4	2X4 Troffer	6	159	0.9552	3120	2,980				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.614	1,917	0.341	1,063
17	Auditorium	F44EE-F44ES		4	2X4 Troffer	30	159	4.776	1335	6,376				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	30	102.4	3.072	4,101	1.704	2,275
18	Storage	F44EE-F44ES		4	2X4 Troffer	2	159	0.3184	720	229				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.205	147	0.114	82
19	Hallway	F44EE-F44ES		4	2X4 Troffer	7	159	1.1144	3150	3,510				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	7	102.4	0.717	2,258	0.398	1,252
20	101	F44EE-F44ES		4	2X4 Troffer	10	159	1.592	3120	4,967				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	10	102.4	1.024	3,195	0.568	1,772
21	Storage	F44EE-F44ES		4	2X4 Troffer	6	159	0.9552	720	688				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.614	442	0.341	245
22	103	F44EE-F44ES		4	2X4 Troffer	6	159	0.9552	3120	2,980				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.614	1,917	0.341	1,063
23	104	F44EE-F44ES		4	2X4 Troffer	6	159	0.9552	3120	2,980				4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.614	1,917	0.341	1,063
																Total T12-T8	143				7.638	18,860

Aloha Systems Measured Savings
05. Willowbrook Senior Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year	
3	116	I100/2		2	Ceiling Mount	2	200	0.4	3120	1,248			CF13/2-DR		2	Compact Fluorescent, (2) 13w drum twin or quad	2	26	0.052	162	0.348	1,086	
5	114	I100/1		1	Ceiling Mount	1	100	0.1	3120	312			CFQ26/1S CW		1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.067	209	
7	Water Heater	I150/1		1	Ceiling Mount	1	150	0.15	720	108			CFQ26/1S CW		1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	24	0.117	84	
12	Kitchen Storage	I100/2		2	Ceiling Mount	2	200	0.4	720	288			CF13/2-DR		2	Compact Fluorescent, (2) 13w drum twin or quad	2	26	0.052	37	0.348	251	
24	Front Desk	I40/1		1	Ceiling Mount	24	40	0.96	3120	2,995			CFQ15/1S CW		1	Compact Fluorescent, quad (1) 15W Lamp	24	20	0.480	1,498	0.480	1,498	
25	Front Desk Storage	I100/1		1	Ceiling Mount	1	100	0.1	720	72			CFQ26/1S CW		1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	24	0.067	48	
26	Auditorium Storage	I100/2		2	Ceiling Mount	1	200	0.2	720	144			CFQ26/1S CW		2	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	24	0.167	120	
27	Under Canopy	I100/2		2	Ceiling Mount	2	200	0.4	3120	1,248			CF13/2-DR 1x1		2	Compact Fluorescent, (2) 13w drum twin or quad fixture	2	26	0.052	162	0.348	1,086	
28	Exterior	I100/1		1	Wall Pack	3	150	0.45	4380	1,971			CF13/2-WP		1	Compact Fluorescent, (2) 13w wall pack fixture	3	26	0.078	342	0.372	1,629	
																Total INCAN	37				2.314	6,011	
					Total	189		25.448		65,840						Total	189				10.44	27,507	

Willowbrook Senior Center – 12915 Jarvis Avenue



Willowbrook Senior Center Entrance



Willowbrook Senior Center Building



Auditorium T-12 Lighting Fixtures



Dining Room T-8 Lighting Fixtures

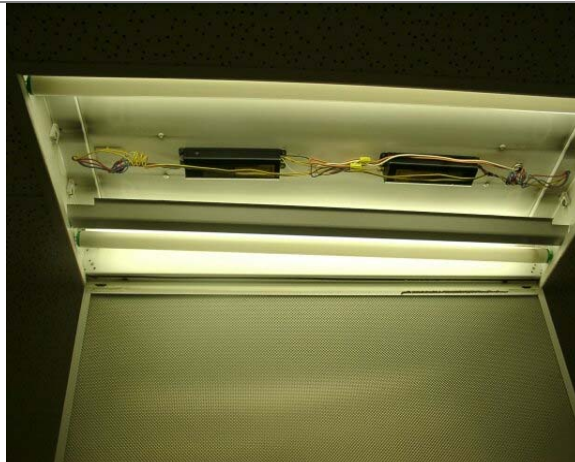


Game Room T-12 Lighting Fixtures

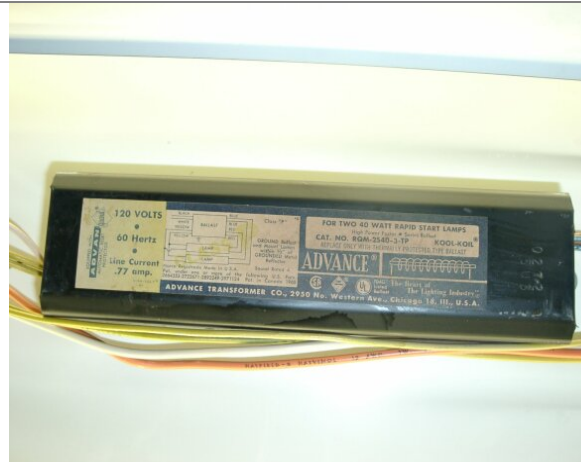


Luis Sanchez Of Aloha Systems Inspecting A Fixture In The Game Room

Willowbrook Senior Center – 12915 Jarvis Avenue



A 4-lamp T-12 Fixture In The Kitchen Area



Standard T-12 Ballast In The Kitchen Fixture



Hallway Fixtures



Powered Exit Sign Location



Powered Exit Sign (1 Of 3)



Non-Powered Exit Sign (1 Of 3)

Site Measurement and Verification Report

Site Number 6

Willowbrook Child Care Center

12829 S. Jarvis Avenue, Los Angeles

SCE Account 3-003-5328-45

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	17,803 kWh
Contractor's As-Built Estimate	21,364 kWh
<i>Ex-Ante</i> Evaluation	29,021 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	27,642 kWh

Site Description

This facility is a single-story childcare facility. It is made up of classrooms and office areas. In the outside rear of the facility, there are mechanical rooms and outdoor patio type areas for the children to play. Southern California Edison supplies the facility at 208/120 volts. The annual energy consumption figures for 2002 and 2003 were not available because Southern California Edison eliminated its easy Internet access to customer usage histories.

We obtained operating hours from a member of the staff at the school. The facility is open Monday through Friday from 7:00 a.m. to 5:00 p.m. It is closed Saturdays and Sundays.

Spreadsheet Errors

Changes made as a result of correcting the contractor's spreadsheet errors are highlighted in lavender on Aloha's "metered" spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor's as-built spreadsheet.

Preliminary Site Visit

The site was visited on March 6, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used standard ballasts and generally used 34W fluorescent tubes.

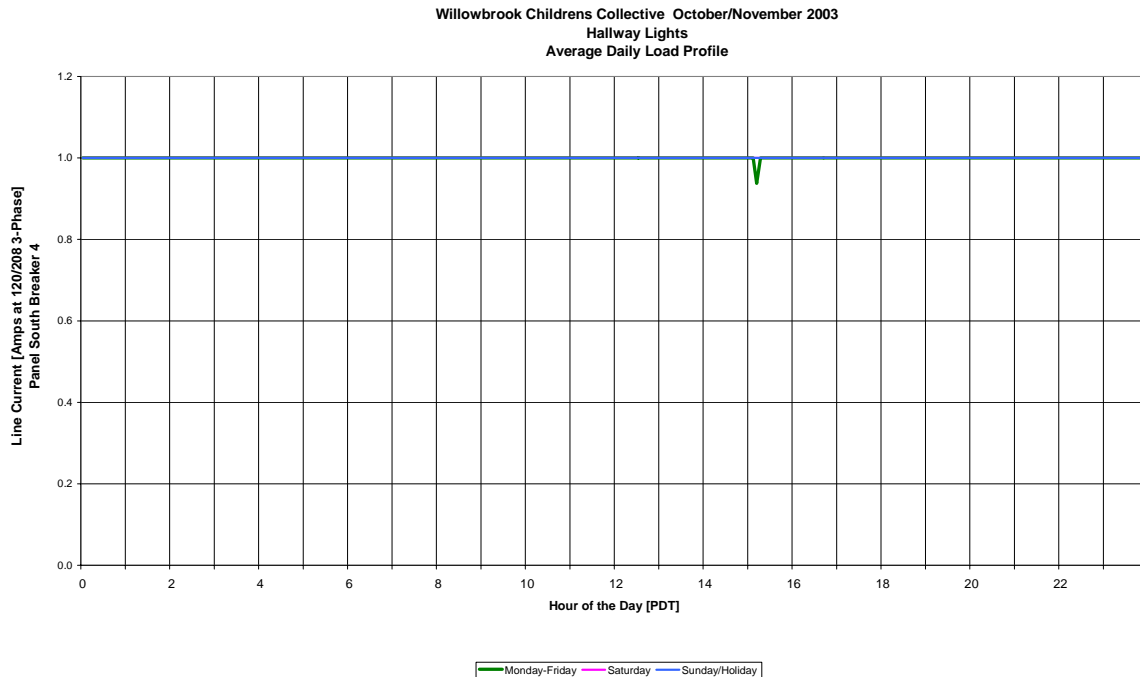
Post-Retrofit Audit

The site was again visited on October 21, 2003. We specifically re-verified the observations noted during the preliminary site visit. Fixture counts were accurate compared to the as-built spreadsheet. The wattages for the new T8 fixtures were adjusted slightly to match the standard wattage tables and were highlighted in magenta.

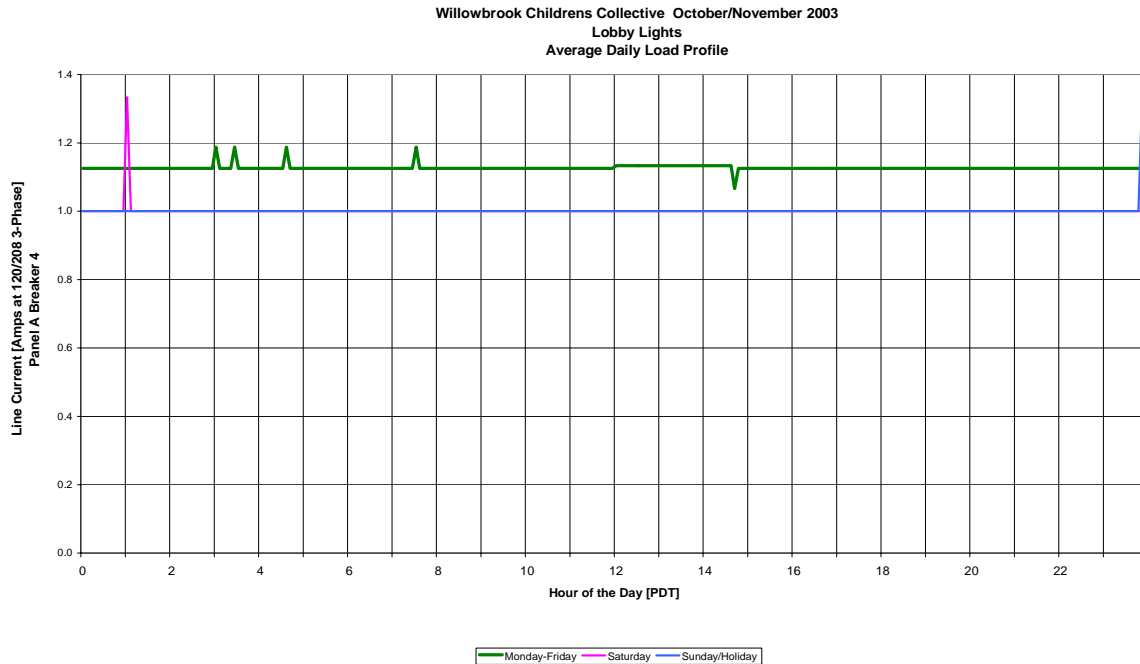
Metered Operating Hours

Four dataloggers were installed in various areas throughout the building. The areas were chosen based on amount of lighting fixtures and how often the lights are on. Two of the dataloggers were placed to record information for a few of the classrooms. One datalogger recorded the hallway lights operating hours. Another datalogger was placed to record the front lobby lights. The employee at the childcare center said these lights never turn off.

Hallway: The load profile below represents the hallway lights at the childcare center. The employee we spoke with at the childcare center mentioned that the hallway lights never turn off. While this is a relatively small load of 1A it is obvious from the load profile below that the lights never do turn off. The operating hours for the hallway lights for one year are 8760 hours per year. The contractor spreadsheet operating hours for the hallway are 3120 hours.

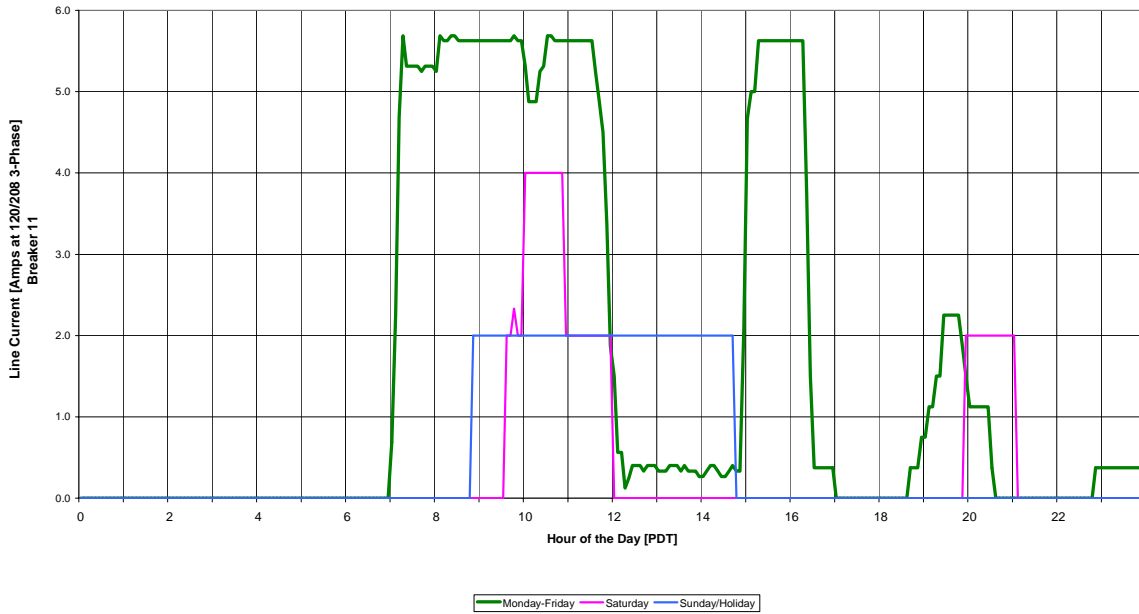


Lobby: The second load profile below represents the lobby lights at the childcare center. The employee we spoke with also mentioned that the lobby lights are on at all times. As the load profile below shows the lights are in fact on at all times. The lobby lights also have a relatively small load. The full load equivalent operating time is 8760 hours per year. The contractor as-built spreadsheet assumed 3120 operating hours per year for the lobby lights.



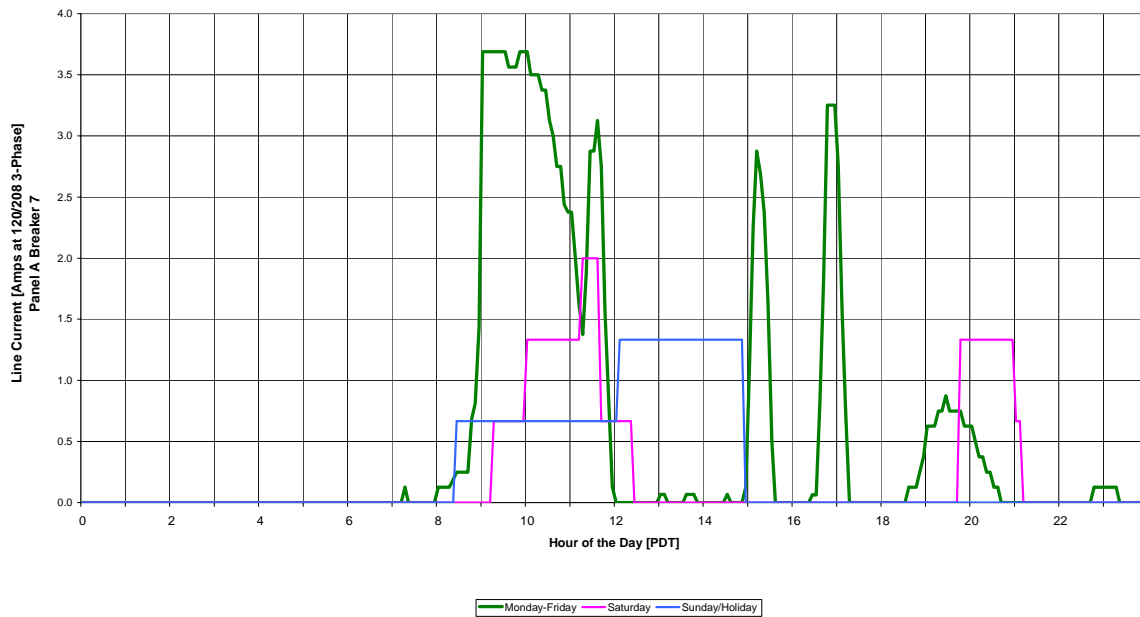
Classrooms 3 & 4: The third load profile on the following page represents classroom 3 and 4, which are combined to create one big classroom. The load profile shows that the lights in the room are on from 7:00 a.m. until noon. At noon the lights are turned off for lunch and naptime. The lights remain off until 3:00 p.m. where they are on for another two hours until 5:00 p.m. Some of the lights in the classroom are turned on from 7:00 p.m. to 8:00 p.m., which we believe to be the time the rooms are cleaned. Although the childcare center is closed at that time, the load profile shows that on Saturday some lights are on from 10:00 a.m. to noon and 8:00 p.m. to 9:00 p.m. On Sunday some lights are on from 9:00 a.m. until 2:30 p.m. The estimated annual operating hours for these two classrooms from the load profile is 1804 hours. This value was also used for Classrooms 1 and 2, which were similar, as well as the restrooms adjacent to the classrooms. The contractor spreadsheet used 3120 operating hours.

Willowbrook Childrens Collective October/November 2003
 Classrooms 3 and 4 Lights
 Average Daily Load Profile



Classroom 6: The final area that was monitored by a datalogger was classroom #6. The load profile is shown below. The lights are on from 9:00 a.m. until noon. Occasionally only half of the lights are on. Similar to classrooms 3 and 4 the lights are turned off between noon and 3:00 p.m. From 3:00 p.m. until 5:00 p.m. the lights are on. During the weekends there is some activity. On some Saturdays some lights are on from 9:00 a.m. to noon and 8:00 p.m. until 9:00 p.m. On some Sundays lights are on at different times from 9:00 a.m. to 3:00 p.m. This results in an equivalent full-load operating time of 994 hours per year. The contractor spreadsheet assumed 3120 operating hours for this classroom. Due to the difference between the estimated operating hours and the measured operating hours the actual energy savings are less than projected.

Willowbrook Childrens Collective October/November 2003
 Classroom #6
 Average Daily Load Profile



The contractor used a generic operating time of 3120 hours per year, which is equivalent to 12 hours per day, 5 days per week. We consider this a reasonable estimate for the offices, kitchen, and other similar areas, and thus leave it unchanged. The official operating times of the facility are 7:00 a.m. until 5:00 p.m. Monday through Friday, or 10 hours per day. The load profiles indicate some evening and weekend use in the classrooms, so some extra office lighting hours on beyond these hours are reasonable to assume as well.

For the storage areas in the building we used 730 hours per year (2 hours per day) and for the outside mechanical rooms we used 365 hours per year (1 hours per day)

Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor's spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor's spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor's spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor's values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

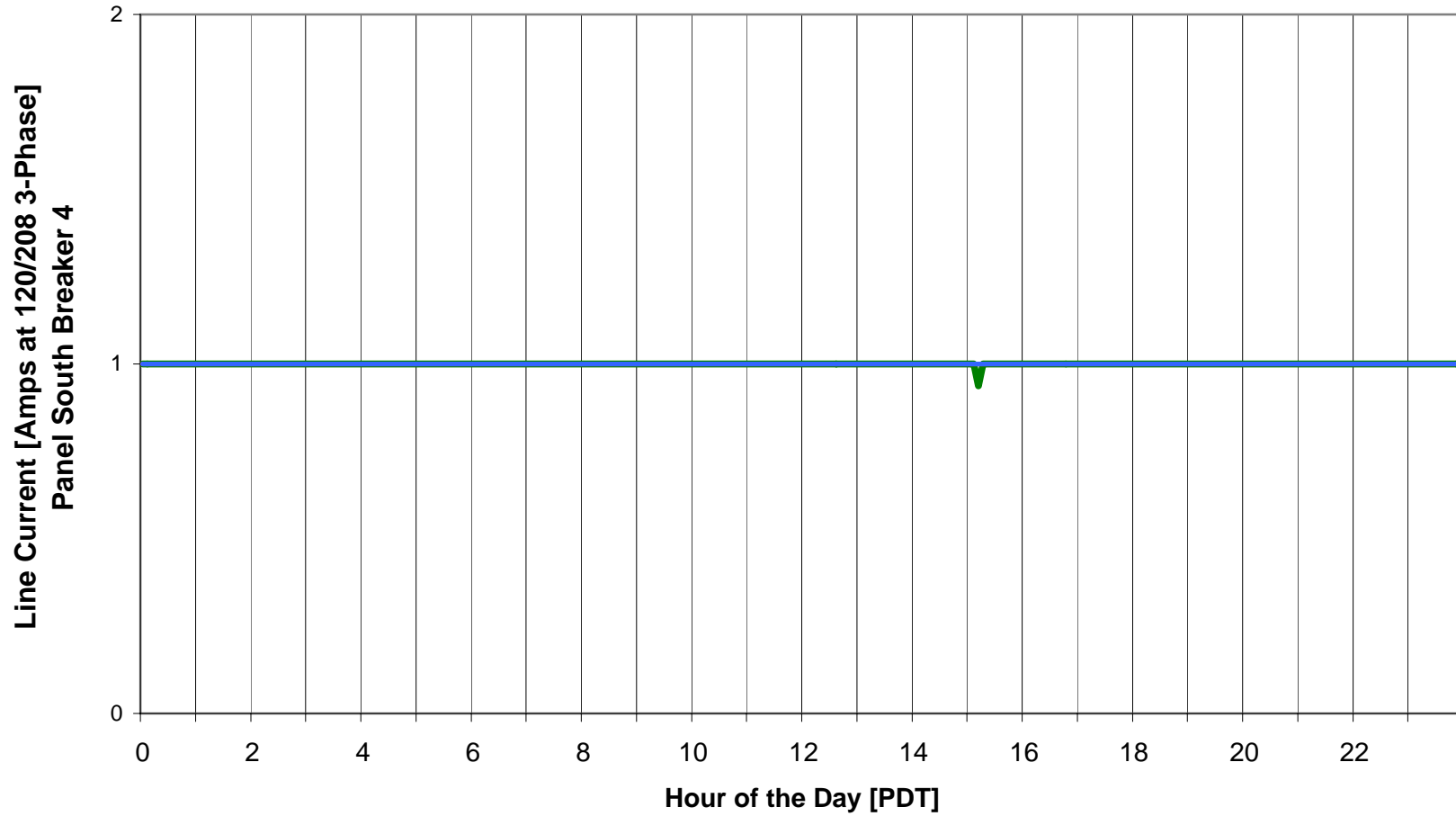
Willowbrook Child Care Center Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	14	2,621	16	3,145	5,774	8,830
T12 to T8	99	8,162	99	9,795	17,090	8,250
Inc to CFL	39	7,020	39	8,424	6,156	10,562
Total	152	17,803	154	21,364	29,021	27,642

The official *ex-ante* savings estimate for the T8 fixtures at this site is higher than either the proposed, as-built, or *ex-post* estimates because most of the lights did not operate the program-wide average of 4,340 hours per year. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county’s proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

Our *ex-post* measurement of savings is higher than either the county’s original assumption or the contractor’s as-built estimate. Correcting the error assuming that the exit lights operate only 3120 hours per year attributed most of the increased savings.

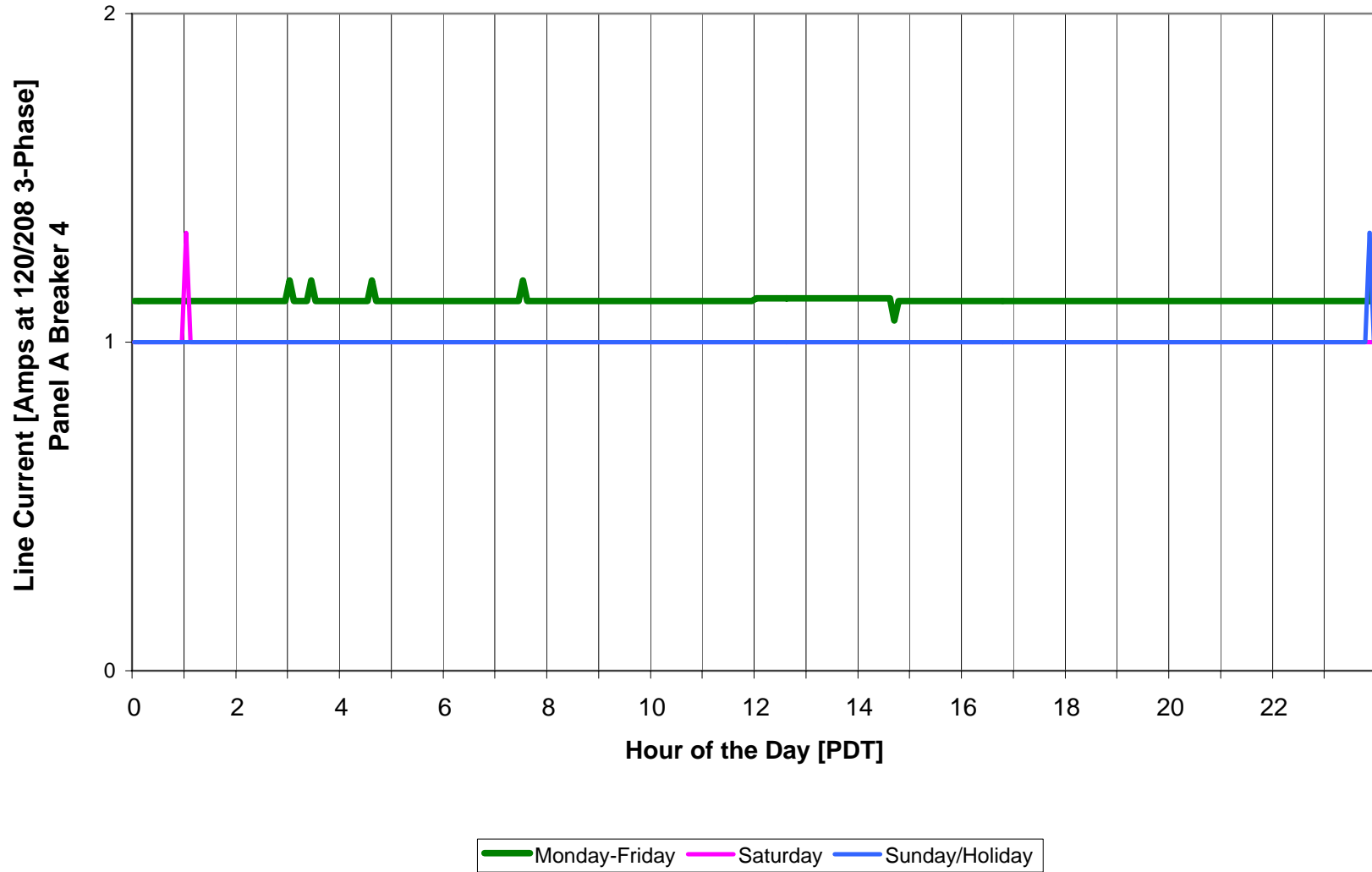
The full-page load profiles and detailed fixture spreadsheets follow this narrative.

Willowbrook Childrens Collective October/November 2003
Hallway Lights
Average Daily Load Profile

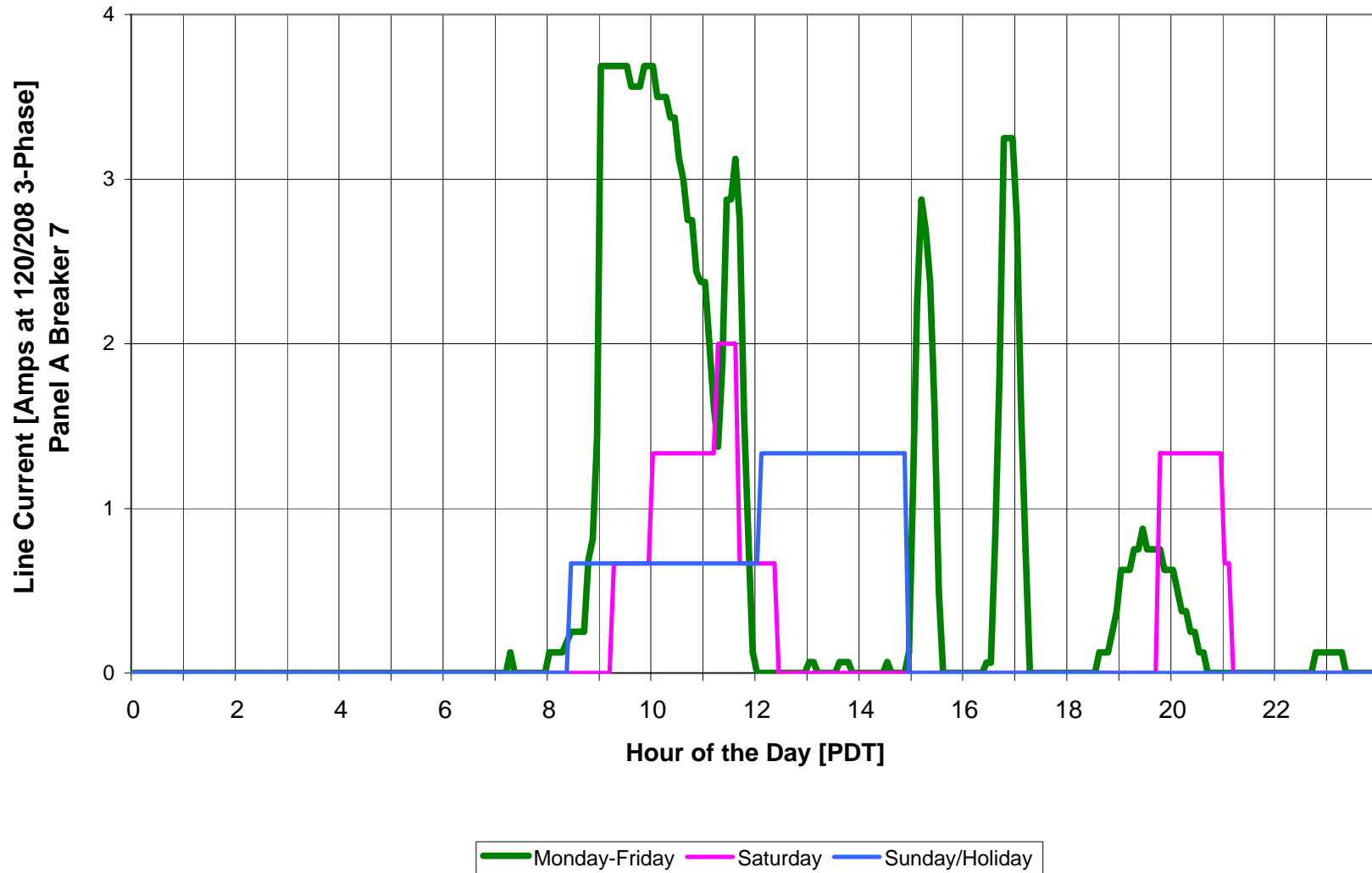


Monday-Friday Saturday Sunday/Holiday

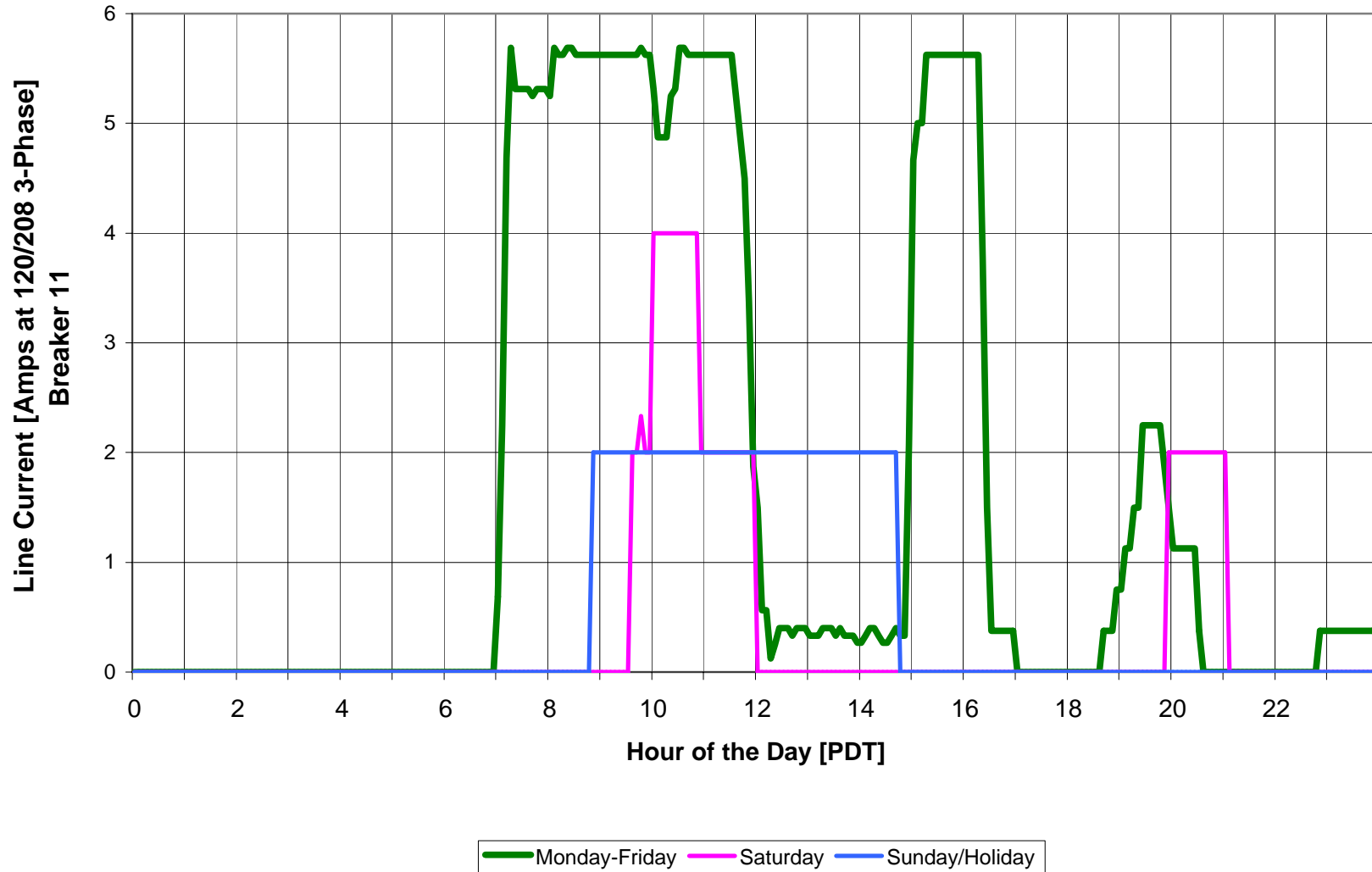
Willowbrook Childrens Collective October/November 2003
Lobby Lights
Average Daily Load Profile



Willowbrook Childrens Collective October/November 2003
Classroom #6
Average Daily Load Profile



Willowbrook Childrens Collective October/November 2003
Classrooms 3 and 4 Lights
Average Daily Load Profile



Contractor As-Built Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
17	Exit Signs	E16/1		1	exit	16	72	1.152	3120	3,594	N		ELED2/2	ELED2/2	1	Exit Light Emmitting Diode (2) 2w lamp Dual Sided	16	9	0.144	449	1.008	3,145
																Total Exits	16				1.008	3,145
1	Classroom 1	F42ES		2	Ceiling Mount	12	78	0.936	3120	2,920	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	12	52.1	0.6252	1,951	0.311	970
3	Restroom	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	163	0.026	81
4	Classroom 2	F42ES		2	Ceiling Mount	16	78	1.248	3120	3,894	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	16	52.1	0.8336	2,601	0.414	1,293
6	Restroom	F42ES		2	Ceiling Mount	2	78	0.156	3120	487	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	2	52.1	0.1042	325	0.052	162
7	Classroom 3	F42ES		2	Ceiling Mount	16	78	1.248	3120	3,894	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	16	52.1	0.8336	2,601	0.414	1,293
9	Classroom 4	F42ES		2	Ceiling Mount	12	78	0.936	3120	2,920	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	12	52.1	0.6252	1,951	0.311	970
11	Restroom	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	163	0.026	81
13	Display	F21SS		1	Surface Mount	2	28	0.056	3120	175	N		F21ILL	2' 2LEB-LW	1	Fluorescent, (2) 24" T"lamp, Instant Start Ballast, RLO (BF<0.85)	2	33	0.066	206	-0.010	-31
14	Hallway	F42ES		2	Ceiling Mount	11	78	0.858	3120	2,677	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	11	52.1	0.5731	1,788	0.285	889
18	Kitchen	F44ES		4	Ceiling Mount	3	156	0.468	3120	1,460	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	102.4	0.3072	958	0.161	502

Contractor As-Built Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
19	Pantry	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	163	0.026	81
21	Classroom	F44ES		4	Pendant Mount	8	156	1.248	3120	3,894	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	8	102.4	0.8192	2,556	0.429	1,338
23	Hallway	F44ES		4	Ceiling Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
24	14	F44ES		4	Pendant Mount	2	156	0.312	3120	973	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334
25	12	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
26	11	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
27	10	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO	1	102.4	0.1024	319	0.054	167
28	Playhouse	F44ES		4	Pendant Mount	2	156	0.312	3120	973	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334
30	102	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
31	Restroom	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	163	0.026	81
32	Restroom	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	163	0.026	81
33	8	F44ES		4	Pendant Mount	2	156	0.312	3120	973	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334
36	107	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167

Contractor As-Built Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
																Total T12-T8	99				3.139	9,795
2	Classroom 1	I60/1		1	Recessed Can	2	60	0.12	3120	374	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	2	33	0.066	206	0.054	168
5	Classroom 2	I60/1		1	Recessed Can	2	60	0.12	3120	374	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	2	33	0.066	206	0.054	168
8	Classroom 3	I60/1		1	Recessed Can	2	60	0.12	3120	374	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	2	33	0.066	206	0.054	168
10	Classroom 4	I60/1		1	Recessed Can	2	60	0.12	3120	374	N		CFQ26/1SCW	CFQ26/1S CW	1	Fluorescent, (2) 48" T-lamp, Instant Start Ballast, RLO (BF<0.85)	2	33	0.066	206	0.054	168
12	Storage	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84
15	Room 5	I100/1		1	Recessed Can	3	100	0.3	3120	936	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	3	33	0.099	309	0.201	627
16	Storage	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84
20	106	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84
22	Entrance Hall	I100/1		1	Pendant Mount	2	100	0.2	3120	624	N		CF13/2-DR	CF13/2- DR	1	Compact Fluorescent, (2) 13w drum twin or quad	2	26	0.052	162	0.148	462
29	101	I60/1		2	Ceiling Mount	3	60	0.18	3120	562	N		CF13/2-WM	CF13/2- WM	2	Compact Fluorescent, (2) 13w wall mount	3	26	0.078	243	0.102	318
34	7	I60/1		2	Ceiling Mount	1	60	0.06	3120	187	N		CF13/2-WM	CF13/2- WM	2	Compact Fluorescent, (2) 13w wall mount	1	26	0.026	81	0.034	106

Contractor As-Built Savings
06. Willowbrook Child Care Center

Contractor As-Built Savings																									
06. Willowbrook Child Care Center																									
Existing Fixtures												New Fixtures								Savings					
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr			
35	7	I100/1		1	Ceiling Mount	1	100	0.1	3120	312	N		CF13/2-DR	CF13/2-DR	1	Compact Fluorescent, (2) 13w drum twin or quad	1	26	0.026	81	0.074	231			
37	Exterior	I150/1		1	Ceiling Mount	2	150	0.3	3120	936	N		CF13/2-WM	CF13/2-WM	1	Compact Fluorescent, (2) 13w wall mount	2	26	0.052	162	0.248	774			
38	Exterior	I150/1		1	Ceiling Mount	4	150	0.6	3120	1,872	N		CF13/2-WM	CF13/2-WM	1	Compact Fluorescent, (2) 13w wall mount	4	26	0.104	324	0.496	1,548			
39	Exterior	I150/1		1	Ceiling Mount	6	150	0.9	3120	2,808	N		CF13/2-WM	CF13/2-WM	1	Compact Fluorescent, (2) 13w wall mount	6	26	0.156	487	0.744	2,321			
40	Exterior	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84			
41	Exterior	I150/1		2	Ceiling Mount	2	150	0.3	3120	936	N		CF13/2-WM	CF13/2-WM	2	Compact Fluorescent, (2) 13w wall mount	2	26	0.052	162	0.248	774			
42	Mechanical Room	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84			
43	Storage	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84			
44	Mechanical Room	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84			
																Total INCAN	39				2.700	8,424			
Total						154		14.408		44,953			Total						154		7.561		23,589	6.85	21,364

Aloha Systems Measured Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
17	Exit Signs	E16/1		1	exit	16	72	1.152	8760	10,092	N		ELED2/2	ELED2/2	1	Exit Light Emmitting Diode (2) 2w lamp Dual Sided	16	9	0.144	1,261	1.008	8,830
																Total Exits	16				1.008	8,830
1	Classroom 1	F42EE		2	Ceiling Mount	12	72	0.864	1804	1,559	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	12	52	0.624	1,126	0.240	433
3	Restroom	F42EE		2	Ceiling Mount	1	72	0.072	1804	130	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52	0.052	94	0.020	36
4	Classroom 2	F42EE		2	Ceiling Mount	16	72	1.152	1804	2,078	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	16	52	0.832	1,501	0.320	577
6	Restroom	F42EE		2	Ceiling Mount	2	72	0.144	1804	260	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	52	0.104	188	0.040	72
7	Classroom 3	F42EE		2	Ceiling Mount	16	72	1.152	1804	2,078	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	16	52	0.832	1,501	0.320	577
9	Classroom 4	F42EE		2	Ceiling Mount	12	72	0.864	1804	1,559	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	12	52	0.624	1,126	0.240	433
11	Restroom	F42EE		2	Ceiling Mount	1	72	0.072	1804	130	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52	0.052	94	0.020	36
13	Display	F21SS		1	Surface Mount	2	28	0.056	3120	175	N		F21ILL	2' 2LEB-LW	1	Fluorescent, (2) 24" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	16	0.032	100	0.024	75
14	Hallway	F42ES		2	Ceiling Mount	11	78	0.858	8760	7,516	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	11	52	0.572	5,011	0.286	2,505
18	Kitchen	F44ES		4	Ceiling Mount	3	156	0.468	3120	1,460	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	3	102	0.306	955	0.162	505

Aloha Systems Measured Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
19	Pantry	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52	0.052	162	0.026	81
21	Classroom 6	F44ES		4	Pendant Mount	8	156	1.248	994	1,241	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	8	102	0.816	811	0.432	429
23	Hallway	F44ES		4	Ceiling Mount	1	156	0.156	8760	1,367	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.102	894	0.054	473
24	14	F44ES		4	Pendant Mount	2	156	0.312	3120	973	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102	0.204	636	0.108	337
25	12	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.102	318	0.054	168
26	11	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.102	318	0.054	168
27	10	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO	1	102	0.102	318	0.054	168
28	Playhouse	F44ES		4	Pendant Mount	2	156	0.312	3120	973	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102	0.204	636	0.108	337
30	102	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.102	318	0.054	168
31	Restroom	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52	0.052	162	0.026	81
32	Restroom	F42ES		2	Ceiling Mount	1	78	0.078	3120	243	N		F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	52	0.052	162	0.026	81
33	8	F44ES		4	Pendant Mount	2	156	0.312	3120	973	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	2	102	0.204	636	0.108	337
36	107	F44ES		4	Pendant Mount	1	156	0.156	3120	487	N		F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T*lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.102	318	0.054	168

Aloha Systems Measured Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings			
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
																Total T12-T8	99					2.830	8,250
2	Classroom 1	I60/1		1	Recessed Can	2	60	0.12	1804	216	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	2	33	0.066	119	0.054	97	
5	Classroom 2	I60/1		1	Recessed Can	2	60	0.12	1804	216	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	2	33	0.066	119	0.054	97	
8	Classroom 3	I60/1		1	Recessed Can	2	60	0.12	1804	216	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	2	33	0.066	119	0.054	97	
10	Classroom 4	I60/1		1	Recessed Can	2	60	0.12	1804	216	N		CFQ26/1SCW	CFQ26/1SCW	1	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	2	33	0.066	119	0.054	97	
12	Storage	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84	
15	Room 5	I100/1		1	Recessed Can	3	100	0.3	1399	420	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	3	33	0.099	139	0.201	281	
16	Storage	I60/1		1	Ceiling Mount	1	60	0.06	730	44	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	24	0.027	20	
20	106	I60/1		1	Ceiling Mount	1	60	0.06	3120	187	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.027	84	
22	Entrance Hall	I100/1		1	Pendant Mount	2	100	0.2	8760	1,752	N		CF13/2-DR	CF13/2-DR	1	Compact Fluorescent, (2) 13w drum twin or quad	2	26	0.052	456	0.148	1,296	
29	101	I60/1		2	Ceiling Mount	3	60	0.18	3120	562	N		CF13/2-WM	CF13/2-WM	2	Compact Fluorescent, (2) 13w wall mount	3	26	0.078	243	0.102	318	
34	7	I60/1		2	Ceiling Mount	1	60	0.06	3120	187	N		CF13/2-WM	CF13/2-WM	2	Compact Fluorescent, (2) 13w wall mount	1	26	0.026	81	0.034	106	

Aloha Systems Measured Savings
06. Willowbrook Child Care Center

		Existing Fixtures										New Fixtures								Savings				
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
35	7	I100/1		1	Ceiling Mount	1	100	0.1	3120	312	N		CF13/2-DR	CF13/2-DR	1	Compact Fluorescent, (2) 13w drum twin or quad	1	26	0.026	81	0.074	231		
37	Exterior	I150/1		1	Ceiling Mount	2	150	0.3	4380	1,314	N		CF13/2-WM	CF13/2-WM	1	Compact Fluorescent, (2) 13w wall mount	2	26	0.052	228	0.248	1,086		
38	Exterior	I150/1		1	Ceiling Mount	4	150	0.6	4380	2,628	N		CF13/2-WM	CF13/2-WM	1	Compact Fluorescent, (2) 13w wall mount	4	26	0.104	456	0.496	2,172		
39	Exterior	I150/1		1	Ceiling Mount	6	150	0.9	4380	3,942	N		CF13/2-WM	CF13/2-WM	1	Compact Fluorescent, (2) 13w wall mount	6	26	0.156	683	0.744	3,259		
40	Exterior	I60/1		1	Ceiling Mount	1	60	0.06	4380	263	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	145	0.027	118		
41	Exterior	I150/1		2	Ceiling Mount	2	150	0.3	4380	1,314	N		CF13/2-WM	CF13/2-WM	2	Compact Fluorescent, (2) 13w wall mount	2	26	0.052	228	0.248	1,086		
42	Mechanical Room	I60/1		1	Ceiling Mount	1	60	0.06	365	22	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	12	0.027	10		
43	Storage	I60/1		1	Ceiling Mount	1	60	0.06	365	22	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	12	0.027	10		
44	Mechanical Room	I60/1		1	Ceiling Mount	1	60	0.06	365	22	N		CFQ26/1SCW	CFQ26/1SCW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	12	0.027	10		
																Total INCAN	39				2.700	10,562		
Total						154		14.048		49,770			Total						154		7.510	22,128	6.54	27,642

Willowbrook Child Care Center – 12829 Jarvis Avenue



Willowbrook Child Care Center Entrance



Outdoor Recessed And Indoor Globe Fixtures



Lobby, 4-lamp Fixture (Near Reception)



Lobby Fixture Ballasts (Near Reception)



Classroom #1 Ceiling Fixtures



Classroom #2 Ceiling Fixtures

Willowbrook Child Care Center – 12829 Jarvis Avenue



Small Classroom Surface Mounted 4-lamp Fixtures



Hallway Fixtures And Exit Sign



Surface Mounted 2-lamp Fixture



Surface Mounted 2-lamp Fixture Energy Saver Ballast



Hidden Fixtures In Observation Room



Pendant Fixture

Site Measurement and Verification Report

Site Number 7

DCSS Florence/Firestone

7807 S. Compton Avenue, Los Angeles

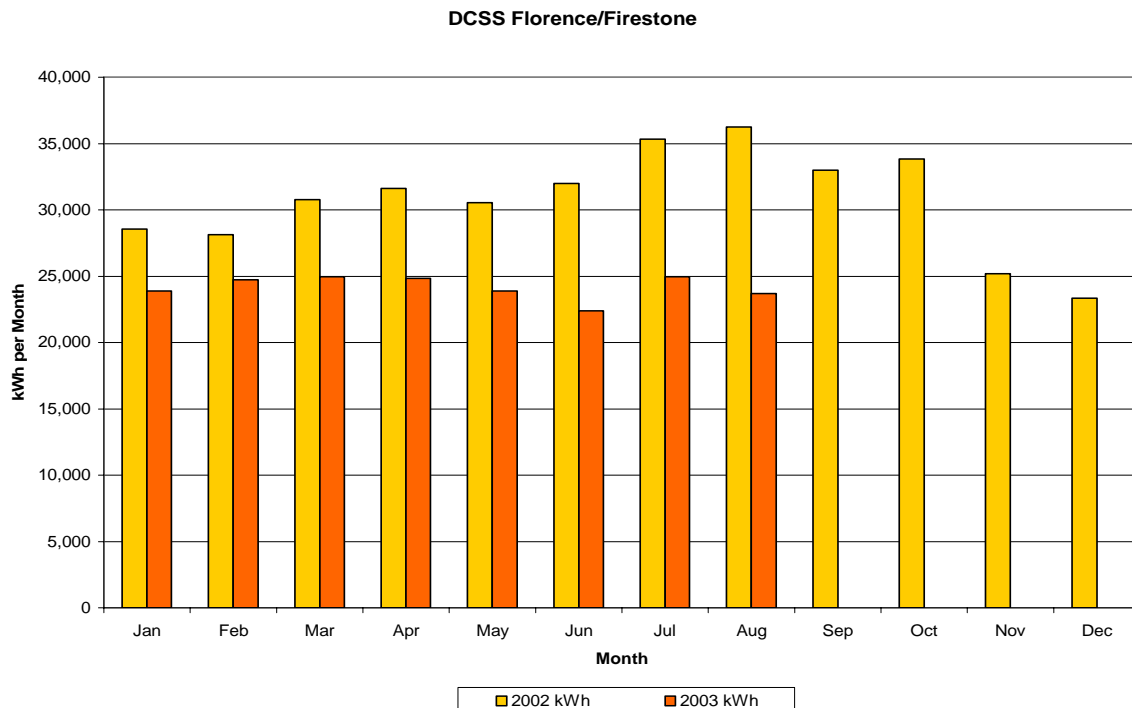
SCE Account 3-001-4068-86

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	39,012 kWh
Contractor's As-Built Estimate	37,992 kWh
Ex-Ante Evaluation	47,086 kWh
Aloha Ex-Post Measured Evaluation	50,710 kWh

Site Description

DCSS Florence/Firestone is a two story building used for Los Angeles County offices. It has a variety of small offices areas, both upstairs and downstairs. Common areas include a conference room, a meeting hall, hallways and rest rooms. Southern California Edison supplies the facility at 480Y/277 volts through meter PO376-002354. Its annual energy consumption in 2002 was 368,580 kWh, and its peak demand was 91 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The office areas of the building are operational Monday-Friday from 8:00 a.m. to 5:00 p.m.



Preliminary Site Visit

The site was visited on Thursday April 24, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

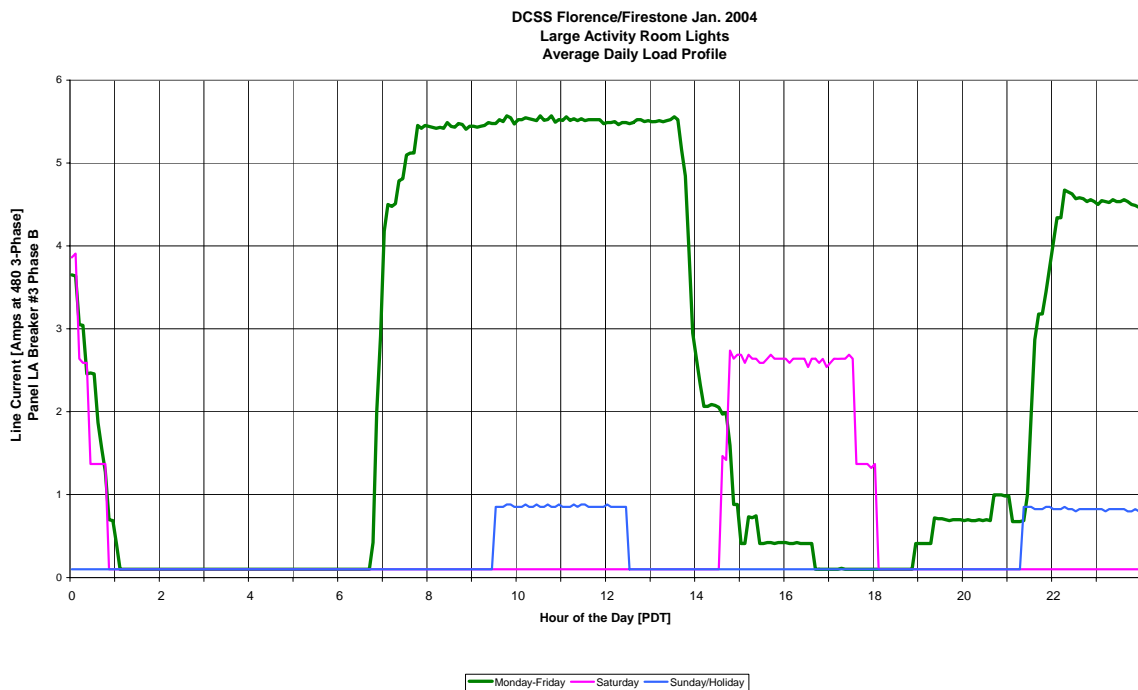
Post-Retrofit Audit

The site was again visited on December 30, 2003. We specifically re-verified the observations noted during the preliminary site visit. All the completed retrofits were verified and were correct.

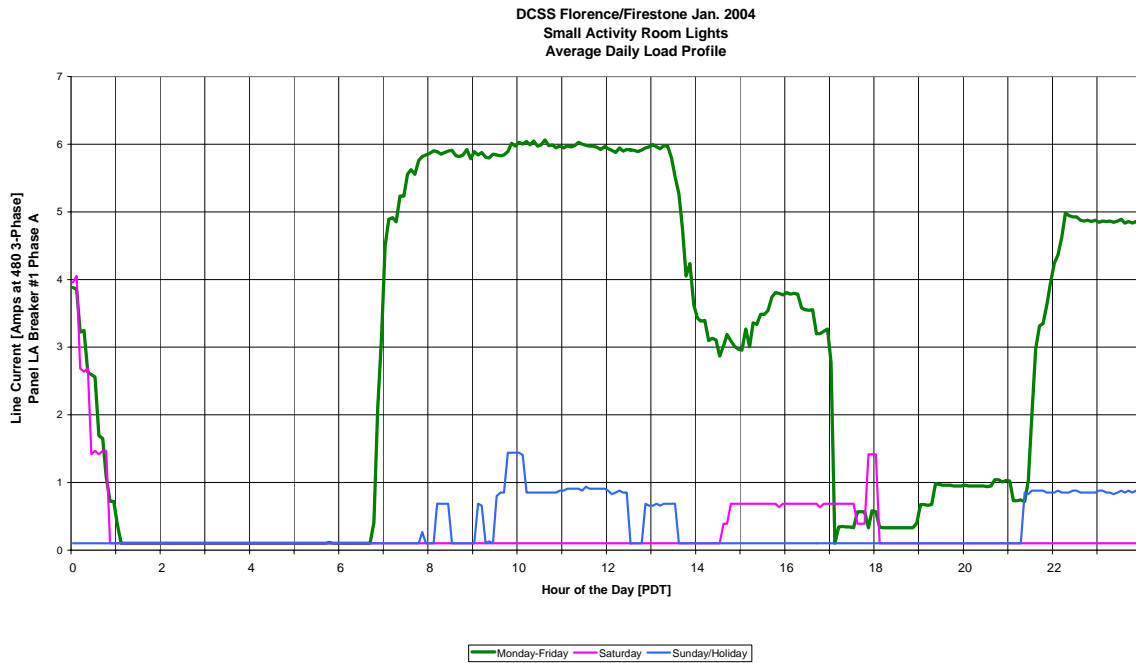
Metered Operating Hours

Dataloggers were installed at the building to verify hours of operation. The areas that were monitored include the activity rooms, the reception area, and two offices. The following load profiles depict the average daily operation of these areas.

Large Activity Room: According to the load profile bellow, the large activity room is in operation from 7:00 a.m. until 2:30 p.m. then again from 9:30 p.m. to 12:30 a.m. during the week. During the weekend the lights are on three and a half hours on Saturday and off on Sunday although they were used on New Year's morning and during the evening of January 2, which together with Martin Luther King Day (January 19, 2004) were allocated to the Sunday/holiday category. Given these hours, the full load equivalent operating time is 2745 hours per year.

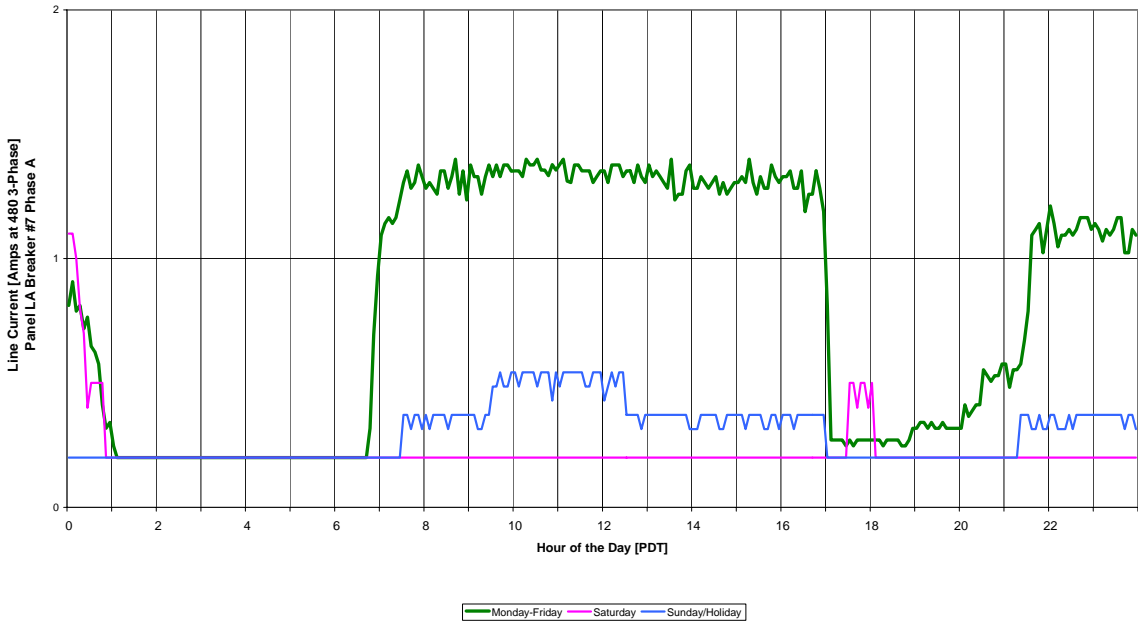


Small Activity Room: The next load profile represents the lights in the small activity room. The load profile shows that there is a similar behavior in both activity rooms. This can be attributed to the fact that a collapsible wall is used to unite both rooms to accommodate more people. However unlike the large activity room, the small activity room's weekday hours are slightly extended giving it a full load equivalent operating time of approximately 3009 hours per year.



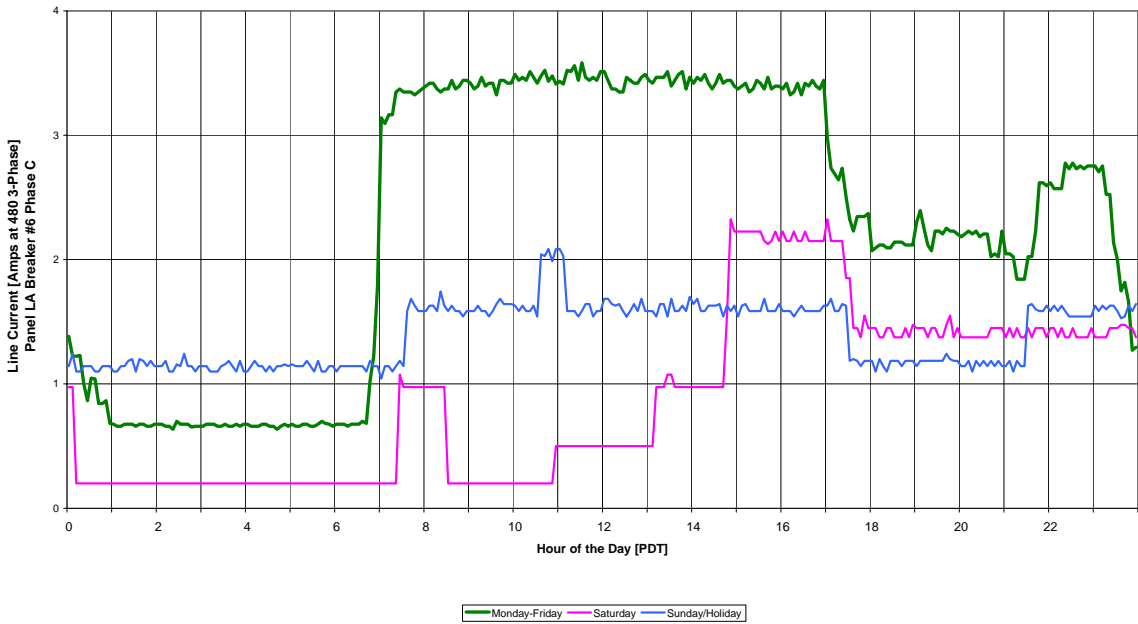
Reception: The load profile on the following page represents the lights in the reception area. According to the load profile, the reception area is in operation from 7:00 a.m. until 5:00 p.m. then again from 9:30 p.m. to 12:30 a.m. during the week. During the weekends and holidays a fraction of the lights operate at approximately the same hours. From the graph it looks as though there is more afternoon use, resulting in a full load equivalent operating time of 4022 hours per year.

DCSS Florence/Firestone Jan. 2004
 Reception/Lobby Lights
 Average Daily Load Profile



Office Area: The last profile represents the behavior of the general office areas in the building. It shows a full load operation from 7:00 a.m. until 5:30 p.m. and partial weekend and holiday use arising both from partial-light use and only being used on certain weekend days. The full load equivalent operating time is 4966 hours per year.

DCSS Florence/Firestone Jan. 2004
 Suite 102 Lights
 Average Daily Load Profile



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 5% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 5% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

DCSS Florence / Firestone Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	27	3,805	15	4,533	5,413	4,533
T12 to T8	219	29,802	235	32,408	40,568	45,126
Inc to CFL	7	1,051	7	1,051	1,105	1,051
Total	253	34,658	257	37,992	47,086	50,710

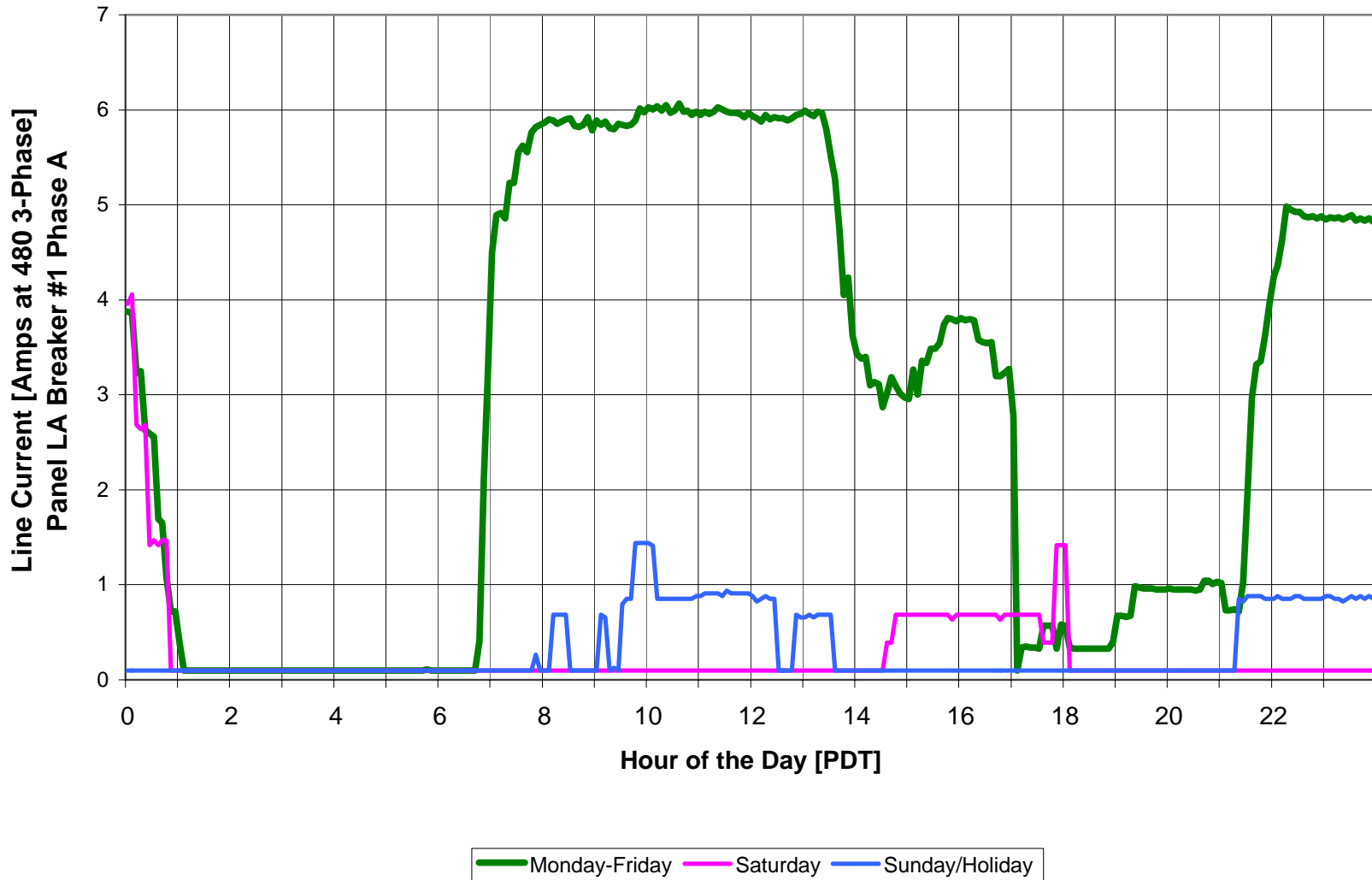
The official *ex-ante* savings estimate for this site is approximately the same as the *ex-post* measured estimate because this site was similar to the system-wide average. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by

average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county's proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

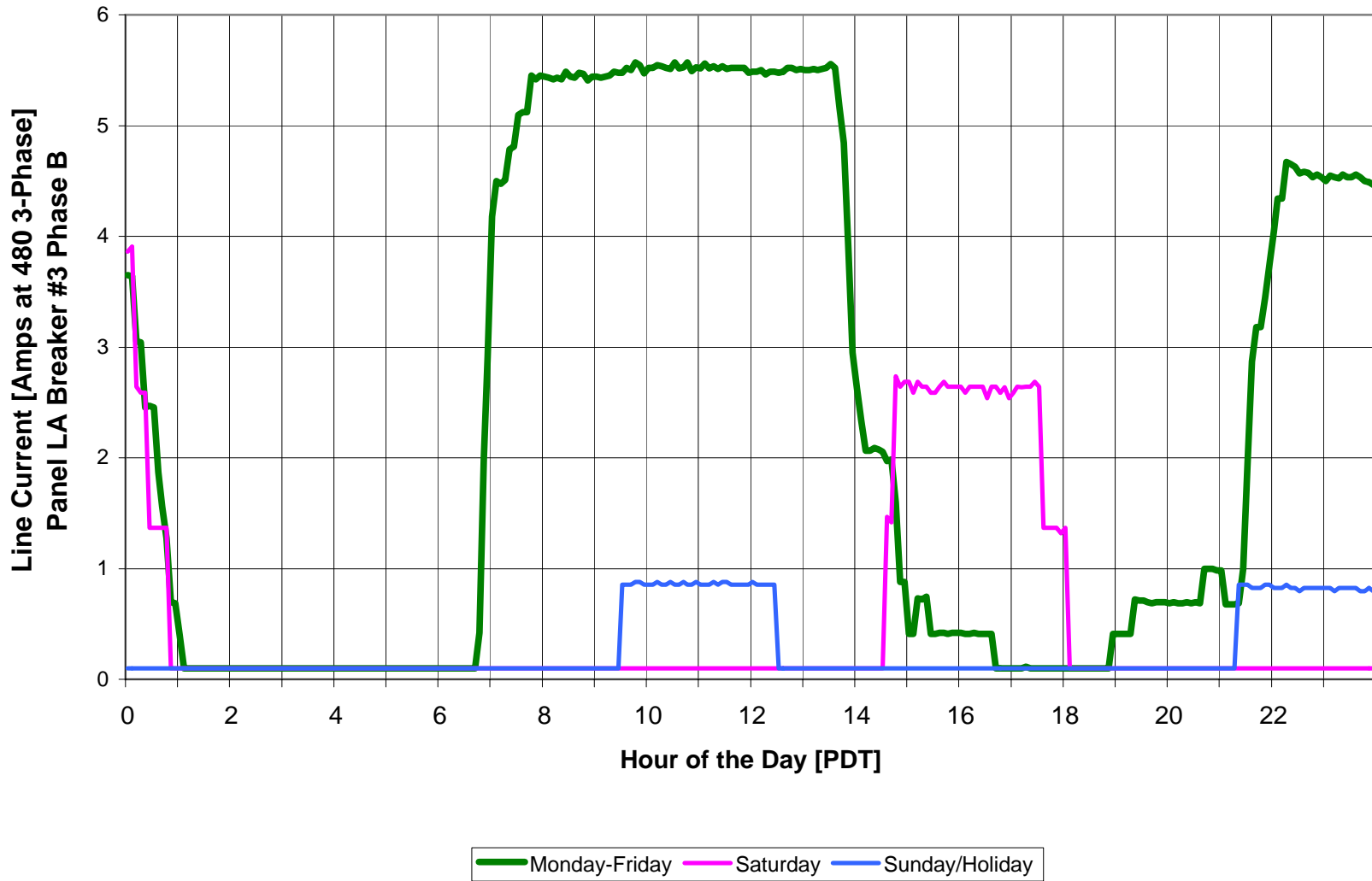
Our *ex-post* measurement of savings is higher than either the county's original assumption or the contractor's as-built estimate because of longer equivalent operating hours resulting from the emergency lights.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

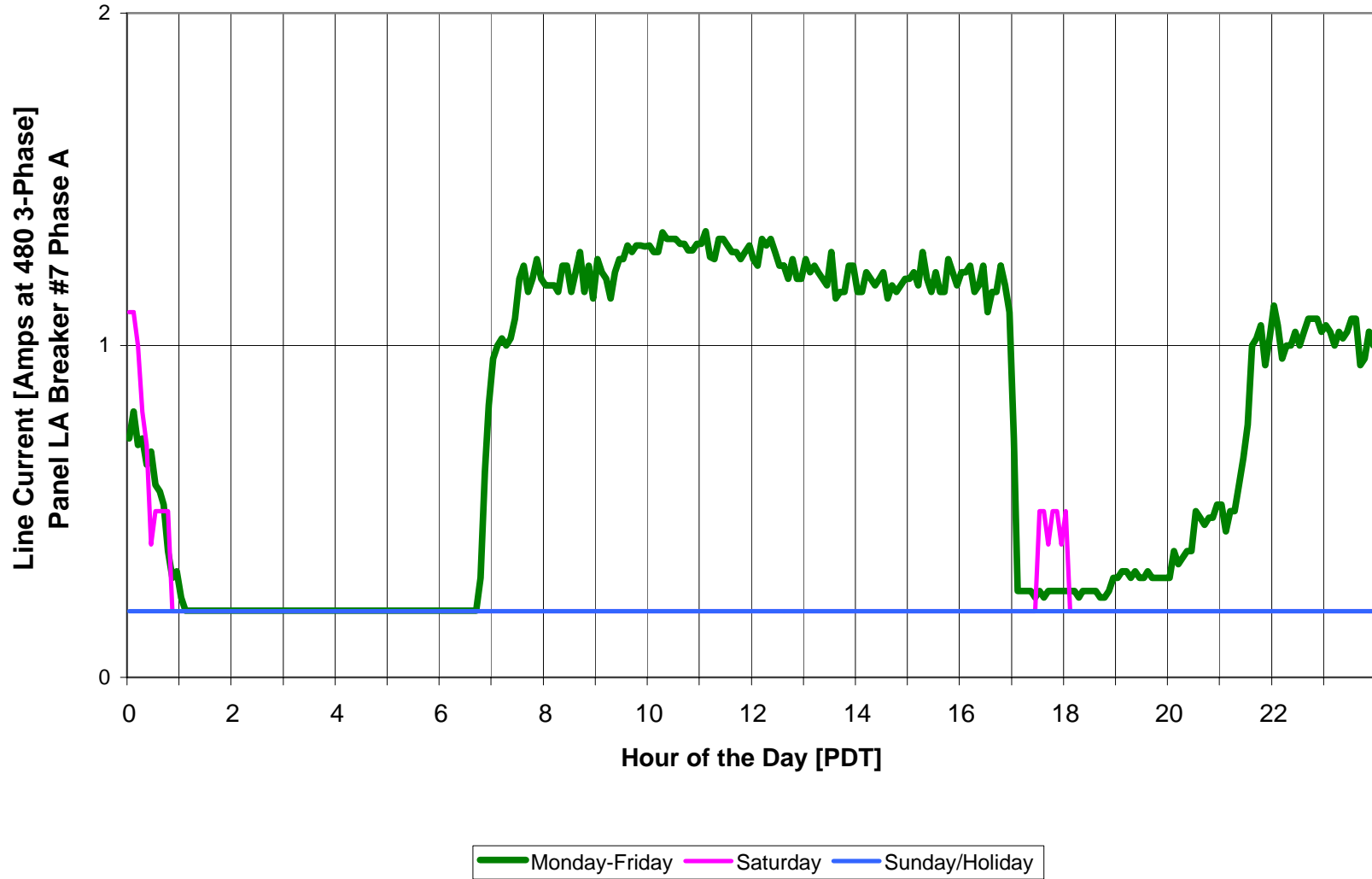
DCSS Florence/Firestone Jan. 2004
Small Activity Room Lights
Average Daily Load Profile



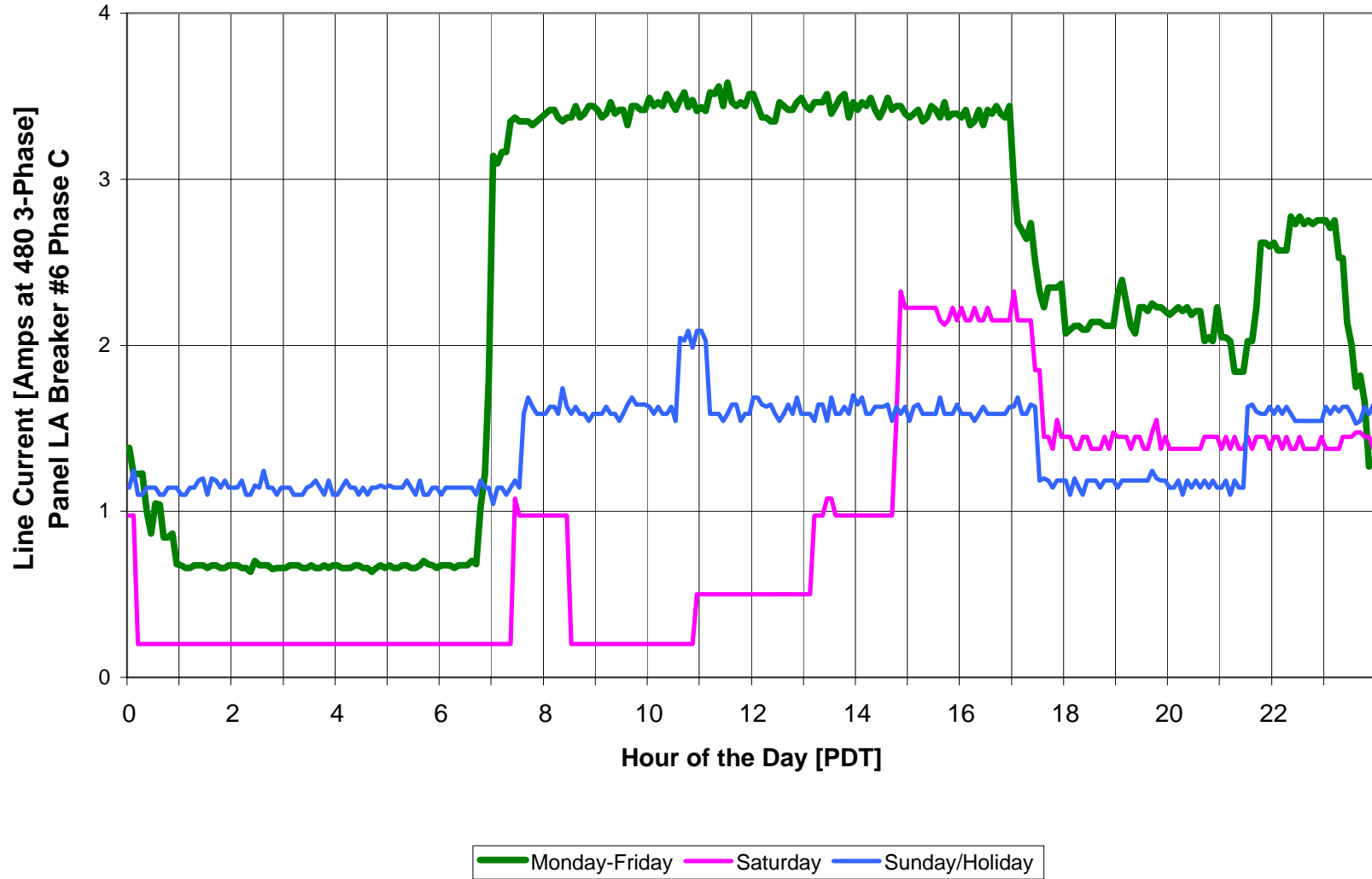
DCSS Florence/Firestone Jan. 2004
Large Activity Room Lights
Average Daily Load Profile



DCSS Florence/Firestone Jan. 2004
Reception/Lobby Lights
Average Daily Load Profile



DCSS Florence/Firestone Jan. 2004
Suite 102 Lights
Average Daily Load Profile



Contractor As-Built Savings
07. DCSS Florence / Firestone

Contractor As-Built Savings																							
07. DCSS Florence / Firestone																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
63	EXTERIOR		MV100/1	8RC100MV	1	RECESSED CAN	0	125	0	4368	0	n	NO CHANG	MV100/1		1	NO CHANGE	0	125	0.00	0	0.000	0
64	EXTERIOR		MV175/1	10RC175MV	1	RECESSED CAN	0	205	0	4368	0	n	NO CHANG	MV175/1		1	NO CHANGE	0	205	0.00	0	0.000	0
																	Total HID	0				0.000	0
2	LOBBY		EI20/2	EI20/2	2	EXIT	3	40	0.12	8760	1,051	n	REPLACE	ELED2/1		1	NEW FIXTURE	3	6	0.02	145	0.104	907
7	ENGINEERING		EI20/2	EI20/2	2	EXIT	1	40	0.04	8760	350	n	REPLACE	ELED2/1		1	NEW FIXTURE	1	6	0.01	48	0.035	302
18	24		EI20/2	EI20/2	2	EXIT	2	40	0.08	8760	701	n	REPLACE	ELED2/1		1	NEW FIXTURE	2	6	0.01	96	0.069	604
29	24		EI20/2	EI20/2	2	EXIT	2	40	0.08	8760	701	n	REPLACE	ELED2/1		1	NEW FIXTURE	2	6	0.01	96	0.069	604
37	LOBBY		EI20/2	EI20/2	2	EXIT	3	40	0.12	8760	1,051	n	REPLACE	ELED2/1		1	NEW FIXTURE	3	6	0.02	145	0.104	907
59	113/114		EI20/2	EI20/2	2	EXIT	4	40	0.16	8760	1,402	n	RETROFIT	ELED2/1		1	NEW FIXTURE	4	6	0.02	193	0.138	1,209
																	Total Exits	15				0.518	4,533
1	LOBBY		FU2EE	222RT/U3	2	TROFFER	13	72	0.936	3120	2,920	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	13	52	0.68	2,109	0.260	811

Contractor As-Built Savings
07. DCSS Florence / Firestone

Contractor As-Built Savings																							
07. DCSS Florence / Firestone																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
3	HIGH CEILING		F44EE	244RT	4	TROFFER	8	144	1.152	3120	3,594	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.70	2,196	0.448	1,398
4	ENGINEERING		FU2EE	222RT/U3	2	TROFFER	2	72	0.144	3120	449	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	2	52	0.10	324	0.040	125
5	ENGINEERING		F44EE	244RT	4	TROFFER	10	144	1.44	3120	4,493	n	RETROFIT	F44ILL-R(G3)		4	LBO	10	88	0.88	2,746	0.560	1,747
6	ENGINEERING		F44EE	244RT	4	TROFFER	15	144	2.16	3120	6,739	n	RETROFIT	F44ILL-R(G3)		4	LBO	15	88	1.32	4,118	0.840	2,621
8	OFFICE		F44EE	244RT	4	TROFFER	1	144	0.144	3120	449	n	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	275	0.056	175
9	OFFICE		F42EE	142WA	2	WRAP	1	72	0.072	2600	187	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	117	0.027	70
10	STORAGE		F42EE	142WA	2	WRAP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14
11	OFFICE		F44EE	244RT	4	TROFFER	2	144	0.288	2600	749	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	458	0.112	291
12	COMMON HALL		FU2EE	222RT/U3	2	TROFFER	1	72	0.072	3120	225	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	1	52	0.05	162	0.020	62
13	COMMON HALL		F44EE	244RT	4	TROFFER	1	144	0.144	3120	449	n	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	275	0.056	175
14	205		F44EE	244RT	4	TROFFER	2	144	0.288	2600	749	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	458	0.112	291
15	206		F44EE	244RT	4	TROFFER	8	144	1.152	2600	2,995	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.70	1,830	0.448	1,165
16	OFFICE		F44EE	244RT	4	TROFFER	5	144	0.72	2600	1,872	n	RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.44	1,144	0.280	728

Contractor As-Built Savings
07. DCSS Florence / Firestone

Contractor As-Built Savings																							
07. DCSS Florence / Firestone																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
17		STORAGE	F42EE	142WA	2	WRAP	3	72	0.216	520	112	n	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.14	70	0.081	42
19		209	F42EE	142WA	2	WRAP	1	72	0.072	1300	94	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	59	0.027	35
20		210	F42EE	142WA	2	WRAP	1	72	0.072	1300	94	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	59	0.027	35
21		212	F42EE	142WA	2	WRAP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14
22		212	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14
23		STAIRWELL	F41EE	141WM	1	WRAP	2	43	0.086	8760	753	n	RETROFIT	F41ILL(G3)		1	LBO	2	27	0.05	475	0.032	279
25		213	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14
26		RESTROOM MEN	F42EE	142WA	2	WRAP	2	72	0.144	1300	187	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.09	117	0.054	70
27		ESTROOM WOMEN	F42EE	142WA	2	WRAP	2	72	0.144	1300	187	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.09	117	0.054	70
28		HALLWAY	F44EE	244RT	4	TROFFER	11	144	1.584	3120	4,942	n	RETROFIT	F44ILL-R(G3)		4	LBO	11	88	0.97	3,020	0.616	1,922
30		218	F44EE	244RT	4	TROFFER	6	144	0.864	3120	2,696	n	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.53	1,647	0.336	1,048
31		217	F44EE	244RT	4	TROFFER	8	144	1.152	3120	3,594	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.70	2,196	0.448	1,398
32		215	F44EE	244RT	4	TROFFER	13	144	1.872	3120	5,841	n	RETROFIT	F44ILL-R(G3)		4	LBO	13	88	1.14	3,569	0.728	2,271

Contractor As-Built Savings
07. DCSS Florence / Firestone

Contractor As-Built Savings																							
07. DCSS Florence / Firestone																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
33	CONFERENCE		F44EE	244RT	4	TROFFER	8	144	1.152	2080	2,396	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.70	1,464	0.448	932
34	214		F44EE	244RT	4	TROFFER	12	144	1.728	3120	5,391	n	RETROFIT	F44ILL-R(G3)		4	LBO	12	88	1.06	3,295	0.672	2,097
35	STAIRWELL		F41EE	141WM	1	WRAP	2	43	0.086	8760	753	n	RETROFIT	F41ILL(G3)		1	LBO	2	27	0.05	475	0.032	279
38	LOBBY		FU2EE	222RT/U3	2	TROFFER	10	72	0.72	3120	2,246	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	10	52	0.52	1,622	0.200	624
39	ADMINISTRATION		F44EE	244RT	4	TROFFER	5	144	0.72	3120	2,246	n	RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.44	1,373	0.280	874
40	102A		F44EE	244RT	4	TROFFER	4	144	0.576	2600	1,498	n	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.35	915	0.224	582
41	102B		F44EE	244RT	4	TROFFER	6	144	0.864	2600	2,246	n	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.53	1,373	0.336	874
42	103		F44EE	244RT	4	TROFFER	2	144	0.288	2600	749	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	458	0.112	291
43	103		FU2EE	222RT/U6	2	TROFFER	2	72	0.144	2600	374	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	2	52	0.10	270	0.040	104
44	104		F44EE	244RT	4	TROFFER	4	144	0.576	2600	1,498	n	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.35	915	0.224	582
45	105		F44EE	244RT	4	TROFFER	6	144	0.864	2600	2,246	n	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.53	1,373	0.336	874
46	106		F44EE	244RT	4	TROFFER	4	144	0.576	2600	1,498	n	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.35	915	0.224	582
47	OFFICE		F44EE	244RT	4	TROFFER	2	144	0.288	2600	749	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	458	0.112	291

Contractor As-Built Savings
07. DCSS Florence / Firestone

		Existing Fixtures											New Fixtures									Savings	
Item	AREA FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
48	HALLWAY	F44EE	244RT	4	TROFFER	2	144	0.288	3120	899	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	549	0.112	349	
49	110	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14	
50	111	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14	
51	112	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14	
52	RESTROOM WOMEN	F42EE	142WA	2	WRAP	1	72	0.072	1300	94	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	59	0.027	35	
53	RESTROOM MEN	F42EE	142WA	2	WRAP	1	72	0.072	1300	94	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	59	0.027	35	
54	RESTROOM MEN	F42EE	142WA	2	WRAP	2	72	0.144	2600	374	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.09	234	0.054	140	
55	RESTROOM WOMEN	F42EE	142WA	2	WRAP	2	72	0.144	2600	374	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.09	234	0.054	140	
57	114	F44EE	244RT	4	TROFFER	12	144	1.728	3120	5,391	n	RETROFIT	F44ILL-R(G3)		4	LBO	12	88	1.06	3,295	0.672	2,097	
58	113	F44EE	244RT	4	TROFFER	20	144	2.88	3120	8,986	n	RETROFIT	F44ILL-R(G3)		4	LBO	20	88	1.76	5,491	1.120	3,494	
60	115	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14	
61	116	F44EE	144WA	4	WRAP	1	144	0.144	3120	449	n	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	275	0.056	175	

Contractor As-Built Savings
07. DCSS Florence / Firestone

Contractor As-Built Savings																											
07. DCSS Florence / Firestone																											
Existing Fixtures												New Fixtures								Savings							
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr				
62		117	F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.05	23	0.027	14				
																	Total T12-T8	235				11.267	32,408				
24	STAIRWELL		I60/1	INCJJ-60	1	INCAN WALL MOUNT	3	60	0.18	8760	1,577	n	RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.10	867	0.081	710				
36	STAIRWELL		I60/1	INCJJ-60	1	INCAN WALL MOUNT	1	60	0.06	8760	526	n	RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.03	289	0.027	237				
56	ELECTRICAL		I100/1	K-100	1	KEYLESS INCAN	3	100	0.3	520	156	n	RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.10	51	0.201	105				
																	Total INCAN	7				0.309	1,051				
Total							257		30.76		92,774			Total							257		18.67		54,783	12.09	37,992

Aloha Systems Measured Savings
07. DCSS Florence / Firestone

		Existing Fixtures											New Fixtures									Savings	
Item	AREA FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
63	EXTERIOR	MV100/1	8RC100MV	1	RECESSED CAN	0	125	0.000	4368	0	n	NO CHANG	MV100/1		1	NO CHANGE	0	125	0.000	0	0.000	0	
64	EXTERIOR	MV175/1	10RC175MV	1	RECESSED CAN	0	205	0.000	4368	0	n	NO CHANG	MV175/1		1	NO CHANGE	0	205	0.000	0	0.000	0	
																Total HID	0				0.000	0	
2	LOBBY	EI20/2	EI20/2	2	EXIT	3	40	0.120	8760	1,051	n	REPLACE	ELED2/1		1	NEW FIXTURE	3	6	0.017	145	0.104	907	
7	ENGINEERING	EI20/2	EI20/2	2	EXIT	1	40	0.040	8760	350	n	REPLACE	ELED2/1		1	NEW FIXTURE	1	6	0.006	48	0.035	302	
18	24	EI20/2	EI20/2	2	EXIT	2	40	0.080	8760	701	n	REPLACE	ELED2/1		1	NEW FIXTURE	2	6	0.011	96	0.069	604	
29	24	EI20/2	EI20/2	2	EXIT	2	40	0.080	8760	701	n	REPLACE	ELED2/1		1	NEW FIXTURE	2	6	0.011	96	0.069	604	
37	LOBBY	EI20/2	EI20/2	2	EXIT	3	40	0.120	8760	1,051	n	REPLACE	ELED2/1		1	NEW FIXTURE	3	6	0.017	145	0.104	907	
59	113/114	EI20/2	EI20/2	2	EXIT	4	40	0.160	8760	1,402	n	RETROFIT	ELED2/1		1	NEW FIXTURE	4	6	0.022	193	0.138	1,209	
																Total Exits	15				0.518	4,533	
1	LOBBY	FU2EE	222RT/U3	2	TROFFER	13	72	0.936	4022	3,765	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	13	52	0.676	2,719	0.260	1,046	

Aloha Systems Measured Savings
07. DCSS Florence / Firestone

Existing Fixtures																						New Fixtures						Savings	
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr						
3	HIGH CEILING		F44EE	244RT	4	TROFFER	8	144	1.152	4022	4,633	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.704	2,831	0.448	1,802						
4	ENGINEERING		FU2EE	222RT/U3	2	TROFFER	2	72	0.144	3120	449	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	2	52	0.104	324	0.040	125						
5	ENGINEERING		F44EE	244RT	4	TROFFER	10	144	1.440	3120	4,493	n	RETROFIT	F44ILL-R(G3)		4	LBO	10	88	0.880	2,746	0.560	1,747						
6	ENGINEERING		F44EE	244RT	4	TROFFER	15	144	2.160	3120	6,739	n	RETROFIT	F44ILL-R(G3)		4	LBO	15	88	1.320	4,118	0.840	2,621						
8	OFFICE		F44EE	244RT	4	TROFFER	1	144	0.144	4966	715	n	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	437	0.056	278						
9	OFFICE		F42EE	142WA	2	WRAP	1	72	0.072	4966	358	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	223	0.027	134						
10	STORAGE		F42EE	142WA	2	WRAP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14						
11	OFFICE		F44EE	244RT	4	TROFFER	2	144	0.288	4966	1,430	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	874	0.112	556						
12	COMMON HALL		FU2EE	222RT/U3	2	TROFFER	1	72	0.072	4022	290	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	1	52	0.052	209	0.020	80						
13	COMMON HALL		F44EE	244RT	4	TROFFER	1	144	0.144	4022	579	n	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	354	0.056	225						
14	205		F44EE	244RT	4	TROFFER	2	144	0.288	4966	1,430	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	874	0.112	556						
15	206		F44EE	244RT	4	TROFFER	8	144	1.152	4966	5,721	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.704	3,496	0.448	2,225						
16	OFFICE		F44EE	244RT	4	TROFFER	5	144	0.720	4966	3,576	n	RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	2,185	0.280	1,390						

Aloha Systems Measured Savings
07. DCSS Florence / Firestone

Aloha Systems Measured Savings 07. DCSS Florence / Firestone																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
17	STORAGE		F42EE	142WA	2	WRAP	3	72	0.216	520	112	n	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	70	0.081	42
19	209		F42EE	142WA	2	WRAP	1	72	0.072	4966	358	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	223	0.027	134
20	210		F42EE	142WA	2	WRAP	1	72	0.072	4966	358	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	223	0.027	134
21	212		F42EE	142WA	2	WRAP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
22	212		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
23	STAIRWELL		F41EE	141WM	1	WRAP	2	43	0.086	8760	753	n	RETROFIT	F41ILL(G3)		1	LBO	2	27	0.054	475	0.032	279
25	213		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
26	RESTROOM MEN		F42EE	142WA	2	WRAP	2	72	0.144	4022	579	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	362	0.054	217
27	ESTROOM WOMEN		F42EE	142WA	2	WRAP	2	72	0.144	4022	579	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	362	0.054	217
28	HALLWAY		F44EE	244RT	4	TROFFER	11	144	1.584	4022	6,371	n	RETROFIT	F44ILL-R(G3)		4	LBO	11	88	0.968	3,893	0.616	2,478
30	218		F44EE	244RT	4	TROFFER	6	144	0.864	4966	4,291	n	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	2,622	0.336	1,669
31	217		F44EE	244RT	4	TROFFER	8	144	1.152	4966	5,721	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.704	3,496	0.448	2,225
32	215		F44EE	244RT	4	TROFFER	13	144	1.872	4966	9,296	n	RETROFIT	F44ILL-R(G3)		4	LBO	13	88	1.144	5,681	0.728	3,615

Aloha Systems Measured Savings
07. DCSS Florence / Firestone

		Existing Fixtures										New Fixtures										Savings	
Item	AREA FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
33	CONFERENCE	F44EE	244RT	4	TROFFER	8	144	1.152	2080	2,396	n	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.704	1,464	0.448	932	
34	214	F44EE	244RT	4	TROFFER	12	144	1.728	4966	8,581	n	RETROFIT	F44ILL-R(G3)		4	LBO	12	88	1.056	5,244	0.672	3,337	
35	STAIRWELL	F41EE	141WM	1	WRAP	2	43	0.086	8760	753	n	RETROFIT	F41ILL(G3)		1	LBO	2	27	0.054	475	0.032	279	
38	LOBBY	FU2EE	222RT/U3	2	TROFFER	10	72	0.720	4022	2,896	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	10	52	0.520	2,091	0.200	804	
39	ADMINISTRATION	F44EE	244RT	4	TROFFER	5	144	0.720	4966	3,576	n	RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	2,185	0.280	1,390	
40	102A	F44EE	244RT	4	TROFFER	4	144	0.576	4966	2,860	n	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,748	0.224	1,112	
41	102B	F44EE	244RT	4	TROFFER	6	144	0.864	4966	4,291	n	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	2,622	0.336	1,669	
42	103	F44EE	244RT	4	TROFFER	2	144	0.288	4966	1,430	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	874	0.112	556	
43	103	FU2EE	222RT/U6	2	TROFFER	2	72	0.144	4966	715	n	RETROFIT	FU2ILL-R		2	FIT KIT-LBO	2	52	0.104	516	0.040	199	
44	104	F44EE	244RT	4	TROFFER	4	144	0.576	4966	2,860	n	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,748	0.224	1,112	
45	105	F44EE	244RT	4	TROFFER	6	144	0.864	4966	4,291	n	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	2,622	0.336	1,669	
46	106	F44EE	244RT	4	TROFFER	4	144	0.576	4966	2,860	n	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,748	0.224	1,112	
47	OFFICE	F44EE	244RT	4	TROFFER	2	144	0.288	4966	1,430	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	874	0.112	556	

Aloha Systems Measured Savings
07. DCSS Florence / Firestone

Aloha Systems Measured Savings 07. DCSS Florence / Firestone																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
48	HALLWAY		F44EE	244RT	4	TROFFER	2	144	0.288	4022	1,158	n	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	708	0.112	450
49	110		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
50	111		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
51	112		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
52	ESTROOM WOMEN		F42EE	142WA	2	WRAP	1	72	0.072	4022	290	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.027	109
53	RESTROOM MEN		F42EE	142WA	2	WRAP	1	72	0.072	4022	290	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	181	0.027	109
54	RESTROOM MEN		F42EE	142WA	2	WRAP	2	72	0.144	4022	579	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	362	0.054	217
55	ESTROOM WOMEN		F42EE	142WA	2	WRAP	2	72	0.144	4022	579	n	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	362	0.054	217
57	114 Small Activity		F44EE	244RT	4	TROFFER	12	144	1.728	3009	5,200	n	RETROFIT	F44ILL-R(G3)		4	LBO	12	88	1.056	3,178	0.672	2,022
58	113 Large Activity		F44EE	244RT	4	TROFFER	20	144	2.880	2745	7,906	n	RETROFIT	F44ILL-R(G3)		4	LBO	20	88	1.760	4,831	1.120	3,074
60	115		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
61	116		F44EE	144WA	4	WRAP	1	144	0.144	4966	715	n	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	437	0.056	278
62	117		F42EE	142OS	2	OPEN STRIP	1	72	0.072	520	37	n	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14

Aloha Systems Measured Savings
07. DCSS Florence / Firestone

Aloha Systems Measured Savings 07. DCSS Florence / Firestone																									
Existing Fixtures												New Fixtures								Savings					
Item	AREA	FLOOR	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
																	Total T12-T8	235				11.267	45,126		
24	STAIRWELL		I60/1	INCJJ-60	1	INCAN WALL MOUNT	3	60	0.180	8760	1,577	n	RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.099	867	0.081	710		
36	STAIRWELL		I60/1	INCJJ-60	1	INCAN WALL MOUNT	1	60	0.060	8760	526	n	RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	289	0.027	237		
56	ELECTRICAL		I100/1	K-100	1	KEYLESS INCAN	3	100	0.300	520	156	n	RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.099	51	0.201	105		
																	Total INCAN	7				0.309	1,051		
Total							257	30.760		126,103		Total							257	18.667		75,393		12.09	50,710

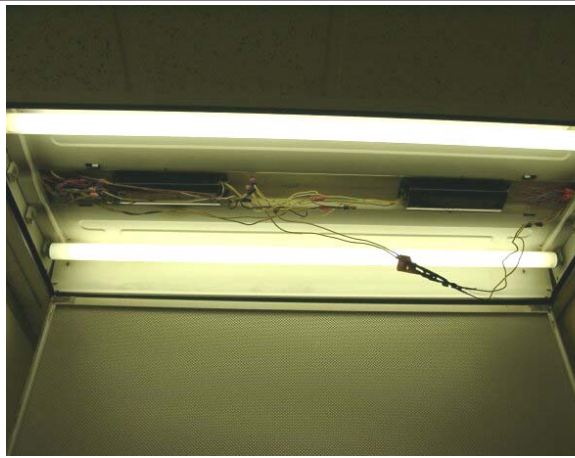
DCSS Florence/Firestone - 7807 S. Compton Avenue



DCSS Florence Facility



Fixtures in Meeting Hall



2 x 4 Fixture in Hallway



Equipment Room Electrical Panels



Lobby Light Fixtures



Large Activity Room Light Fixtures

DCSS Florence/Firestone - 7807 S. Compton Avenue



Old 2 x 4 Ballast



Exterior Recessed HID Fixture



Exit Sign



2 x 2 Fixture



2x2 Fixture Ballast



Hallway Light Fixtures

Site Measurement and Verification Report

Site Number 8

ISD District 3 Facilities Operation

11236 Playa Court, Los Angeles

SCE Account 3-002-7515-55

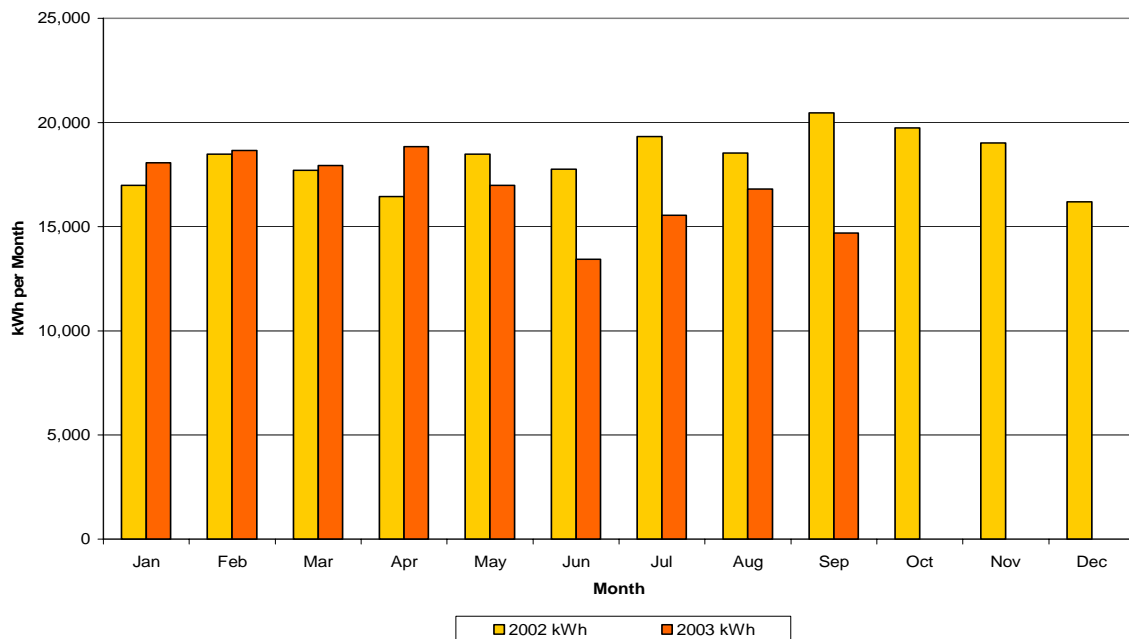
Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	55,763 kWh
Contractor's As-Built Estimate	56,525 kWh
<i>Ex-Ante</i> Evaluation	52,978 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	98,475 kWh

Site Description

ISD District 3 Facilities Operation is a dispatch area for maintenance technicians. There are offices inside a main bullpen room, with smaller, individual offices around the perimeter of the bullpen. There is also a large warehouse/workshop area in the rear of the facility along with a small vehicle maintenance auto shop area. Southern California Edison supplies the facility at 480Y/277 volts through meter PO826-007154. Its annual energy consumption in 2002 was 219,120 kWh, and its peak demand was 91 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

This facility operates Monday-Friday, with normal business hours of 6:00 a.m. to 7:00 p.m.

ISD District 3 Facilities Operations



Preliminary Site Visit

The site was visited on February 20, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. There were two instances of an incorrect fixture count, which amounted to two fixtures. The office lighting system consisted mainly of 4-lamp fixtures with energy saver, 34-watt lamps and energy saving ballasts. There are also a limited number of fixtures with 2 lamps per fixture. In the workshop there were high output 2-lamp fluorescent strip fixtures. The auto-shop area uses standard 2-lamp fluorescent strip fixtures.

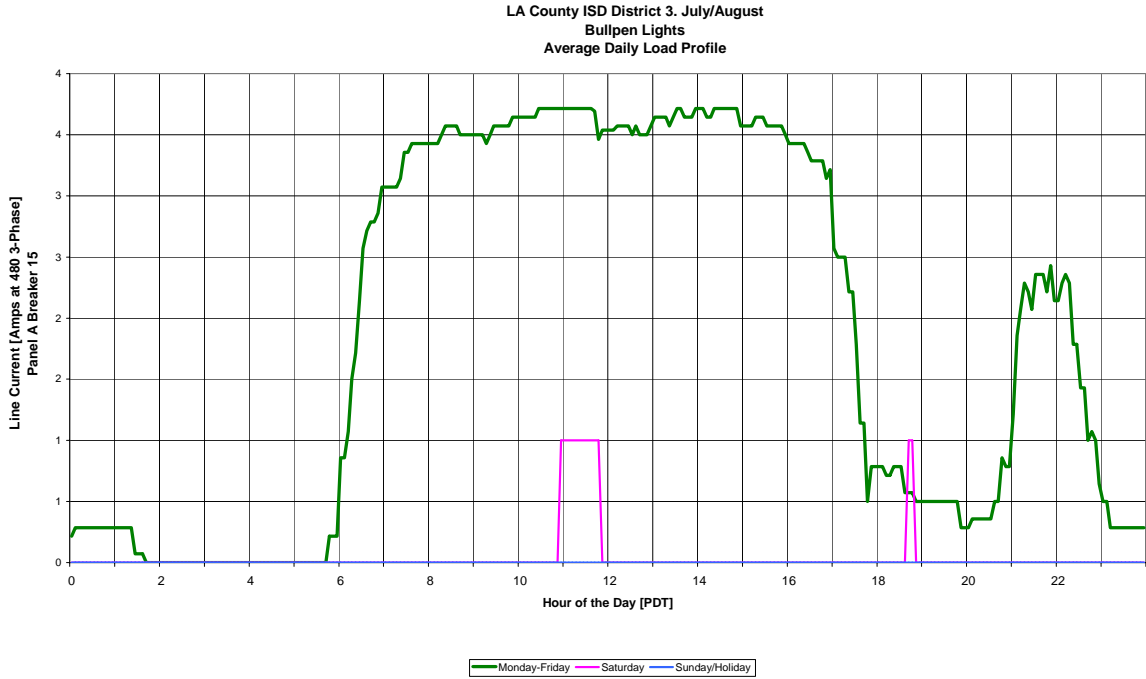
Post-Retrofit Audit

The site was again visited on July 23, 2003. We specifically re-verified the observations noted during the preliminary site visit. We counted 75 high-output fixtures instead of the 81 listed on the spreadsheet. A few areas on the spreadsheet had wrong amounts for certain fixtures. All other fixture counts were correct when checked with the spreadsheet.

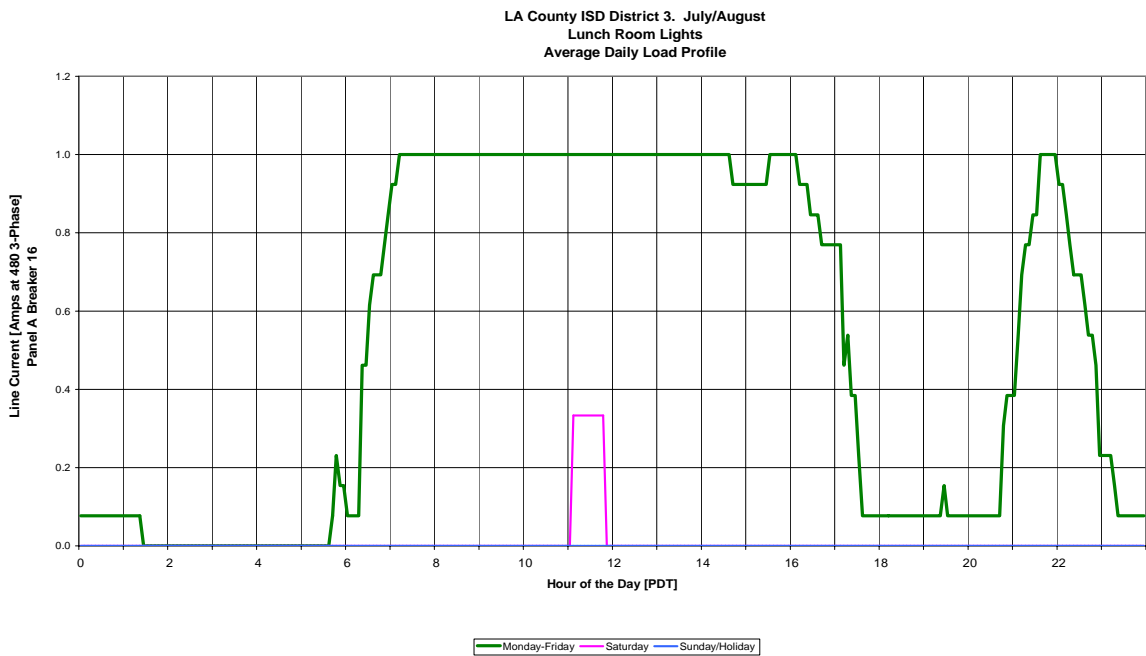
Metered Operating Hours

During the visit dataloggers were installed to monitor four areas. The four areas chosen were based on fixture count, location, and how active the area is. The lunchroom was monitored because it has eight fixtures and should only be active during lunch hours. The next area that was monitored is the front office or bullpen. This area had the most fixtures in an office type environment. The last two areas that were monitored were the warehouse and the garage. The load profiles will give an accurate representation of when lights are actually turned on and turned off during the workweek and the weekends.

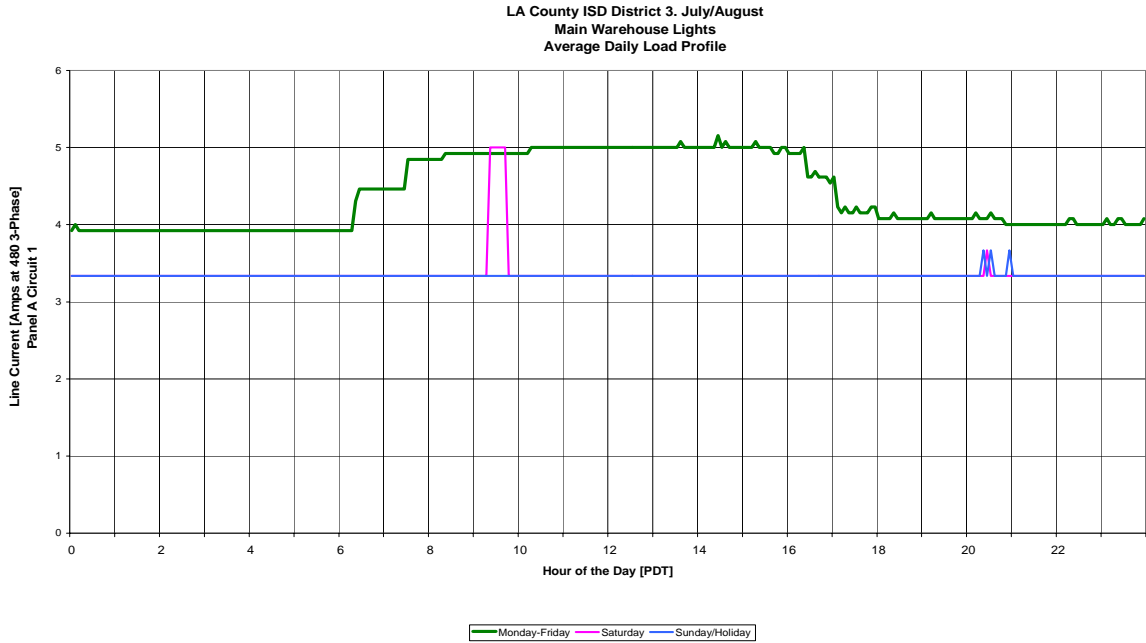
Bullpen: The load profile on the following page represents the bullpen lights. These lights are on during normal business hours from 7:00 a.m. until 5:00 p.m. The lights turn on again at 9:00 p.m. until 11:00 p.m. This is probably when the offices are being cleaned. The operating hours from the information in the load profile is 3,233 hours per year. The contractor as built spreadsheet has 3,600 hours per year.



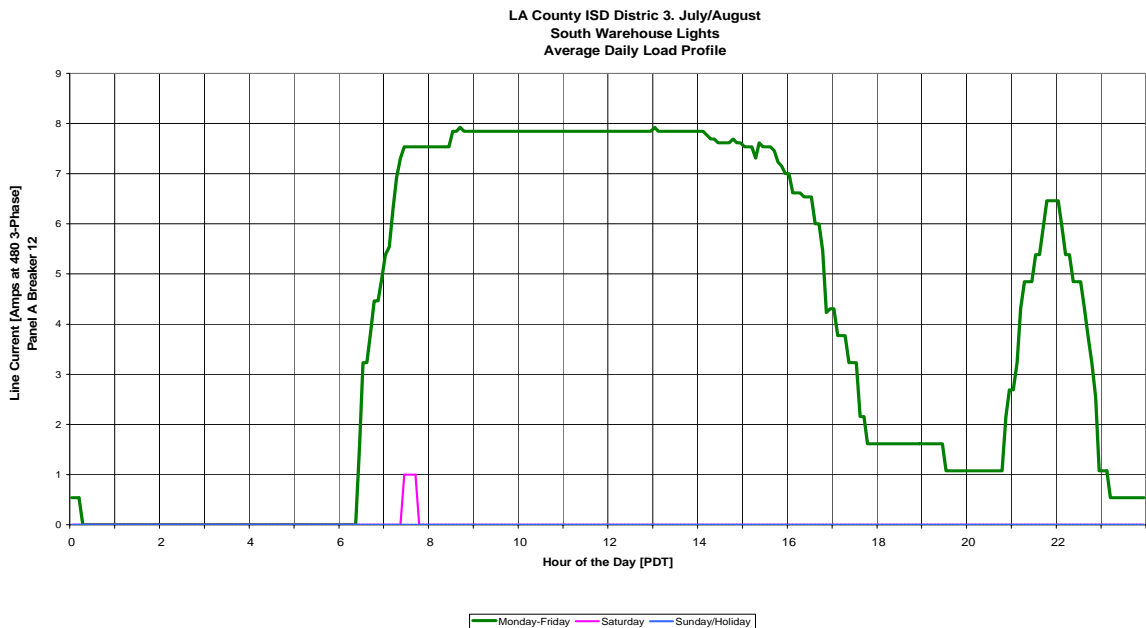
Lunch Room: The load profile below represents the lunchroom. The lunchroom lights are on from 7:00 a.m. until 5:00 p.m. and 9:00 p.m. until 11:00 p.m. There also seems to have been one Saturday when the lunchroom lights were turned on for about an hour. The lunchroom has a full load equivalent operating time of 3188 operating hours according to the load profile. The contractor as built spreadsheet only has 2600 hours.



Main Warehouse: The load profile on the following page represents the main warehouse lights. These lights are on continuously most days. On rare occasions they were shut off at night. The equivalent operating hours are 7357 hours per year. The contractor as built spreadsheet only has 2600 operating hours. The estimate of energy savings attributed to the new fixtures is increased significantly because of their extended operating hours.



South Warehouse: The load profile below represents the south warehouse lights. The lights are on, similarly to previous profiles, from 7:00 a.m. until 5:00 p.m. and 9:00 p.m. until 11:00 p.m. The full load equivalent operating time is 2970 hours per year. The contractor as built spreadsheet only has 2600 hours.



The hours for the bullpen office (3233) and the lunchroom (3188) are similar. They are somewhat higher than the 2600 value used by the contractor. The 3233 value will be used for the restrooms and hallways and other similar areas around the open office. The individual offices, assumed to operate somewhat less than the common use areas, will be left at 2600. The 2970 h/yr value for the small warehouse will also be used for the various workshops and areas associated with the warehouse.

Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

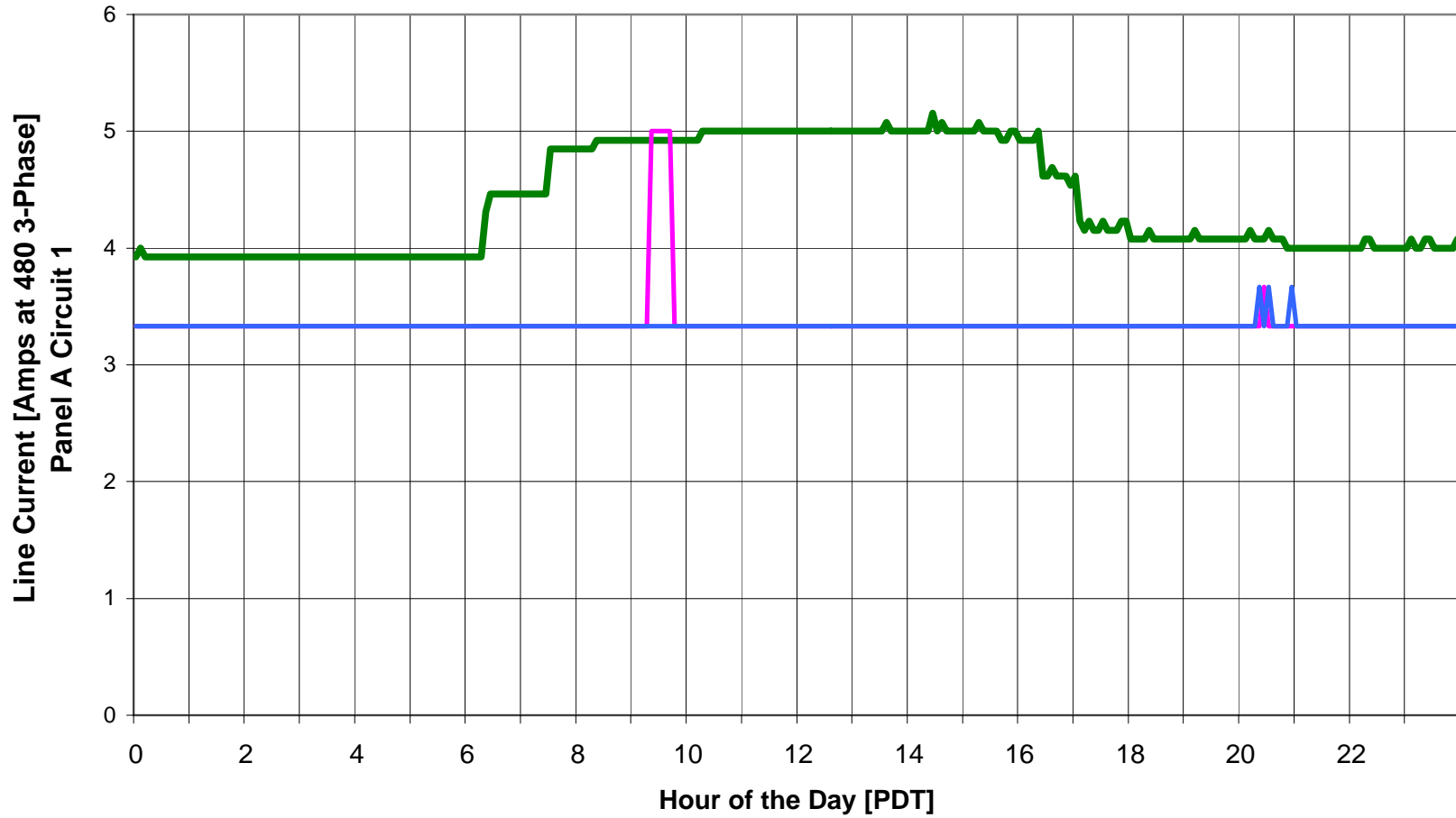
ISD – DIST. 3 Facilities Operation Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	301	54,847	295	55,576	50,926	96,452
Inc to CFL	12	916	13	949	2,052	2,023
Total	313	55,763	308	56,525	52,978	98,475

The *ex-ante* savings estimate for this site is similar to the proposed and as-built estimates because the fixtures and operating times assumed were similar to the program-wide average values.

Our *ex-post* measurement of savings is considerably higher than these estimates because the operating hours, particularly in the large warehouse, were much longer than assumed by any of the preliminary estimates.

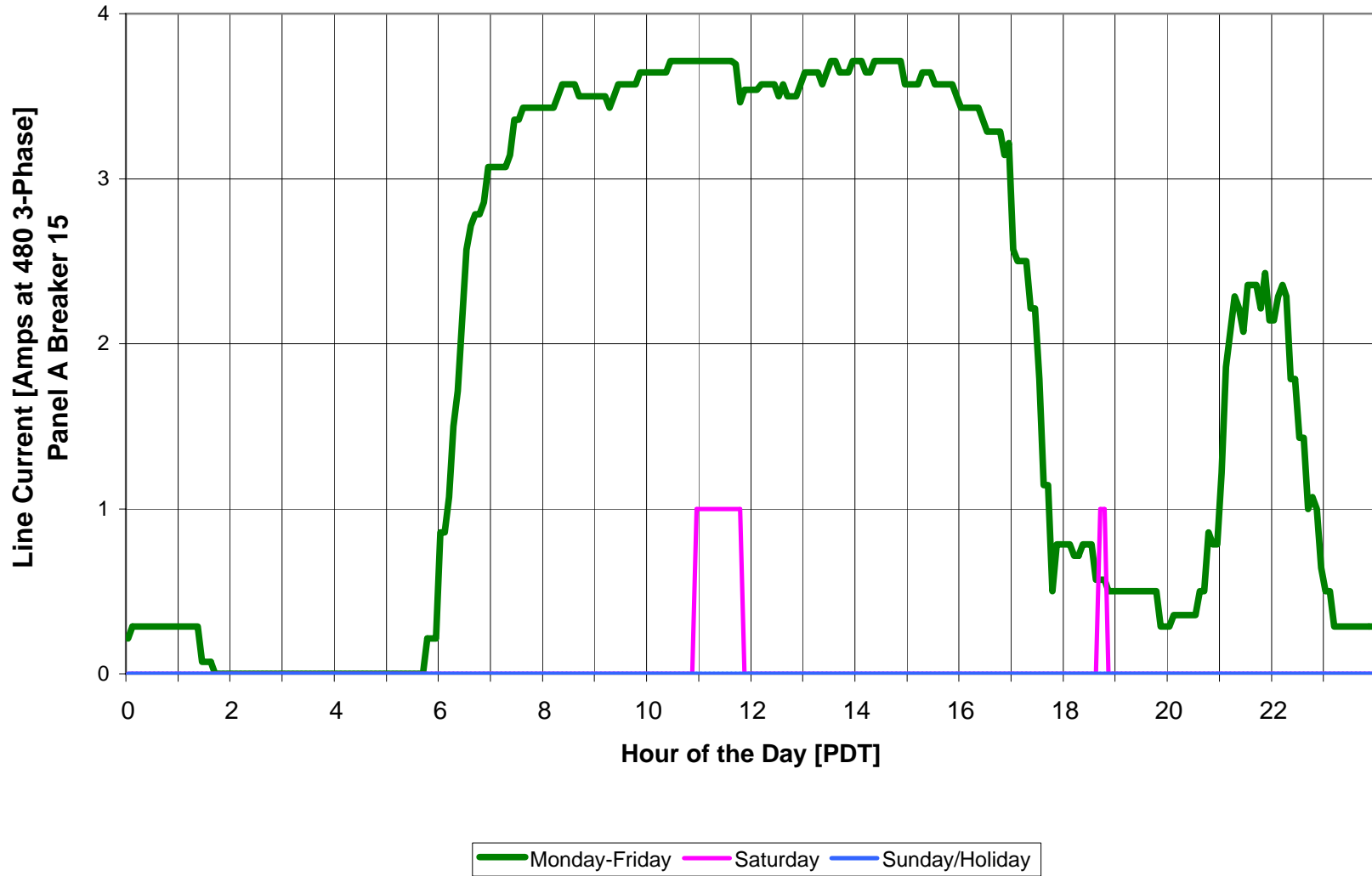
The full-page load profiles and detailed fixture spreadsheets follow this narrative.

LA County ISD District 3. July/August
Main Warehouse Lights
Average Daily Load Profile

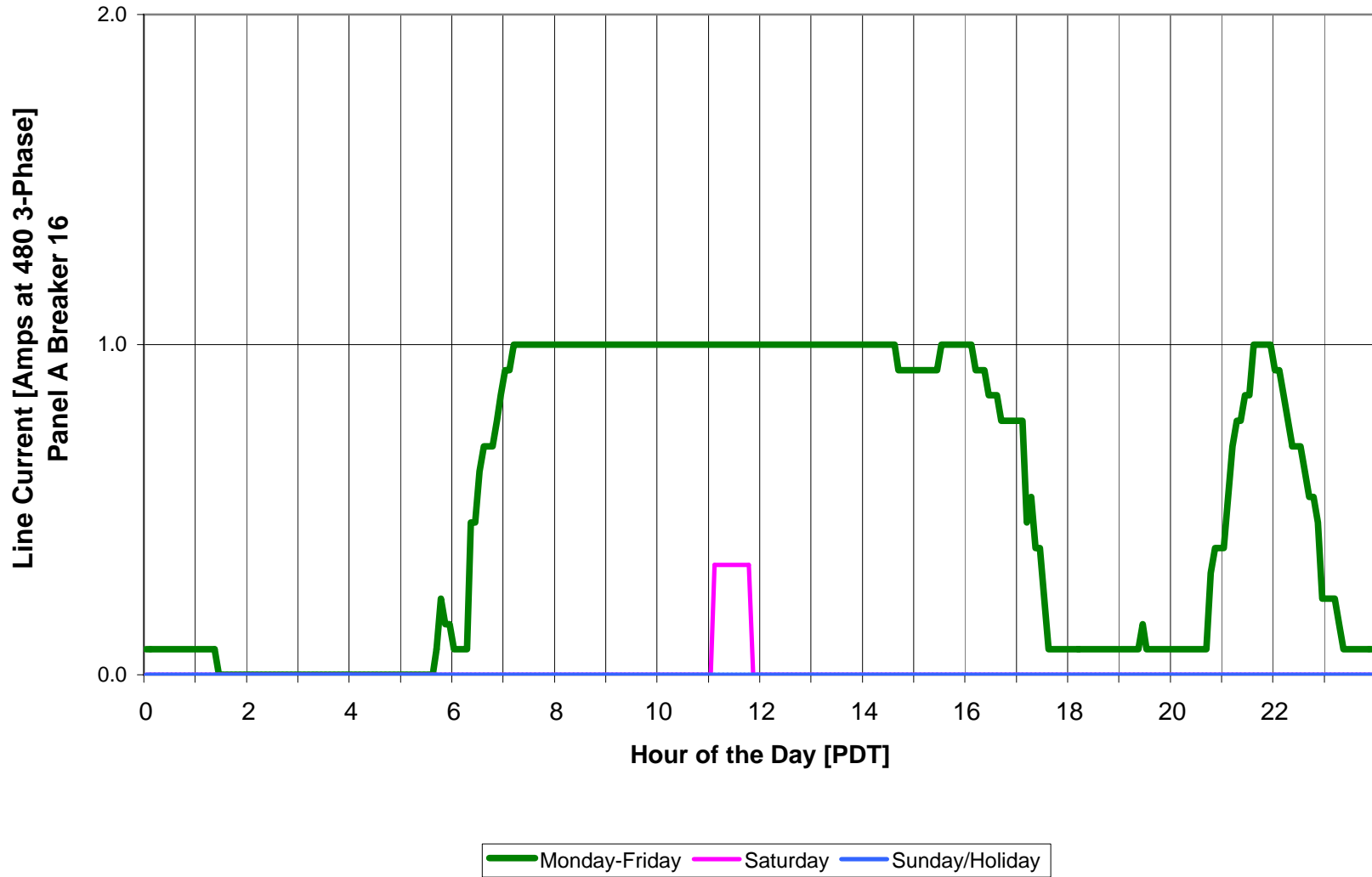


Monday-Friday Saturday Sunday/Holiday

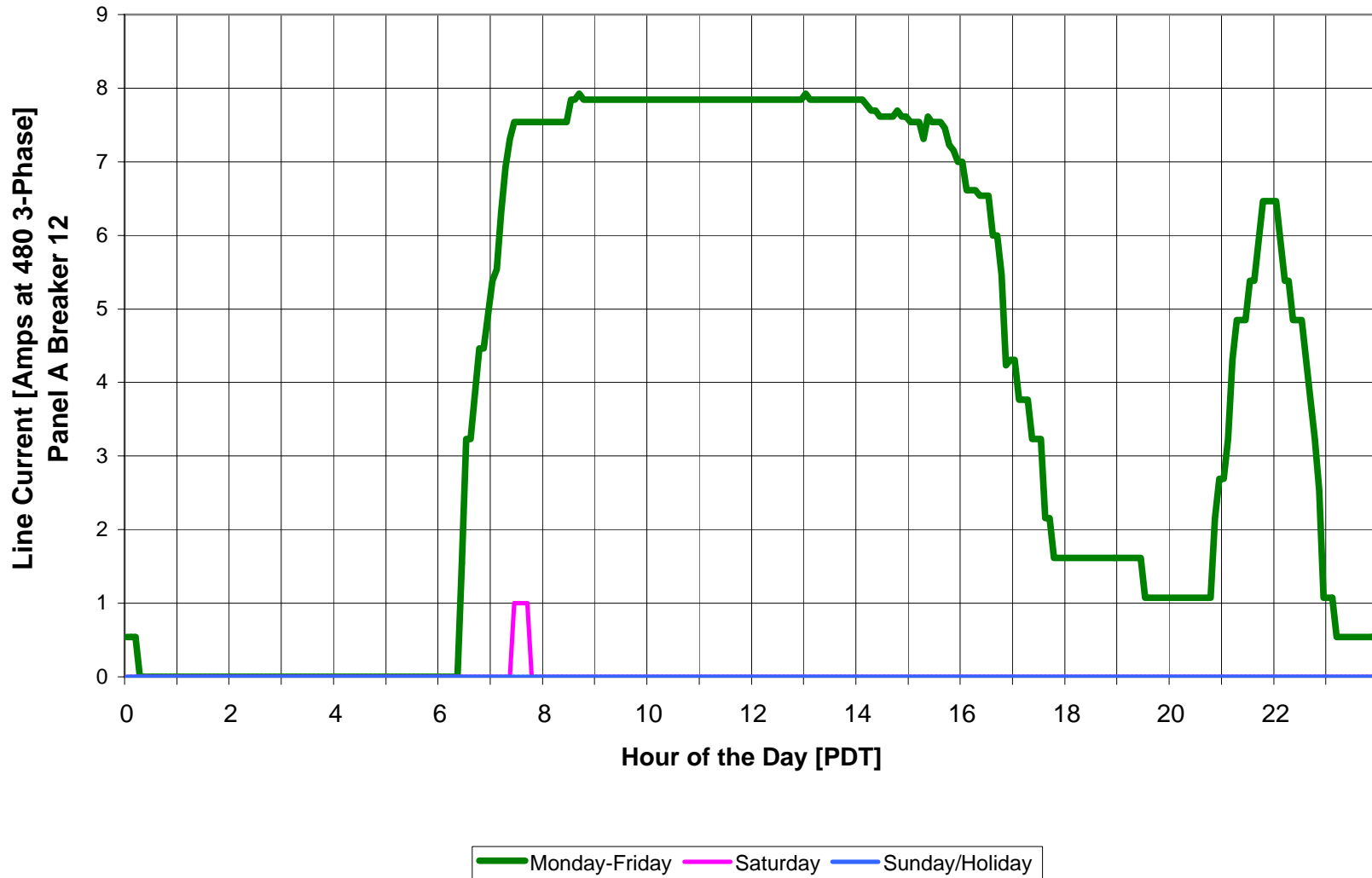
LA County ISD District 3. July/August
Bullpen Lights
Average Daily Load Profile



LA County ISD District 3. July/August
Lunch Room Lights
Average Daily Load Profile



LA County ISD Distric 3. July/August
South Warehouse Lights
Average Daily Load Profile



Contractor As-Built Savings
08. ISD District 3 Facilities Operation

Contractor As-Built Savings																						
08. ISD District 3 Facilities Operation																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
6	Bullpen #2	EITT	Exit Sign	0	Exit - Tritium	1	0	0	0	0	0	No Change	EITT		0	No Change	0	0	0	0	0.000	0
																Total Exits	0				0.000	0
1	Bullpen Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	53	144	7.632	2600	19,843	Multi	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	53	59	3.127	8,130	4.505	11,713
2	Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	4	144	0.576	2600	1,498	WS	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	4	59	0.236	614	0.340	884
2.1	Closet	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 1-ES ballast, prismatic lens	1	144	0.144	780	112		Retrofit	F42ILL-R		2	F32T8 lamps, 2 1 lamp low watt electronic ballast, new sockets	1	51	0.051	40	0.093	73
3	Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	2	144	0.288	2600	749	1G	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	2	59	0.118	307	0.170	442
4	Bullpen #2	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	16	144	2.304	2600	5,990	AB	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	16	59	0.944	2,454	1.360	3,536
5	Bullpen #2	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34T12/U6, 1-ES ballast, prismatic lens	4	72	0.288	2600	749	AB	Retrofit	F42ILL-R		2	FB32T8 lamps, 2 1 lamp low watt electronic ballast, new sockets	4	51	0.204	530	0.084	218
7	Custodial Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	3	144	0.432	2600	1,123		Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	3	59	0.177	460	0.255	663
8	Custodial Office	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34T12/U6, 1-ES ballast, prismatic lens	1	72	0.072	2600	187	AB	Retrofit	F42ILL-R		2	FB32T8 lamps, 2 1 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.021	55
9	Closet	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, 1-ES ballast, prismatic lens	1	72	0.072	2600	187		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.021	55
10	Locksmith- NO ACCESS	F44EE	1x4 Wrap	4	1x4, 4 lamp F34T12, 1-ES ballast, prismatic lens	10	144	1.44	2600	3,744		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	10	51	0.51	1,326	0.930	2,418

Contractor As-Built Savings

08. ISD District 3 Facilities Operation

Contractor As-Built Savings																						
08. ISD District 3 Facilities Operation																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
10.1	Locksmith- NO ACCESS	F82EE	1x8 Strip	4	1x8, 2 lamp F96 60W, ES ballast, strip fixture	4	123	0.492	2600	1,279		Retrofit	F44ILL-R		4	4F32T8 lamps, 1 low watt 2 lamp electronic ballast, conversion kit	4	102	0.408	1,061	0.084	218
11	Locked Doors- NO ACCESS		1x4 Wrap	1	1x4, 2 lamp F34T12, 1-ES ballast, prismatic lens actually vandal resistant wall pack 13W	0	13	0.078	2600	203		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	0	13	0.078	203	0.000	0
12	Hall	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	4	144	0.576	2600	1,498		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	4	51	0.204	530	0.372	967
13	Hall	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	2	144	0.288	2600	749		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	265	0.186	484
15	Men's Restroom	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	144	0.144	2600	374		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.093	242
17	Women's Restroom	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, 1-ES ballast, prismatic lens	1	72	0.072	2600	187		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.021	55
19	Lunch Room	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	8	144	1.152	2600	2,995	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	8	51	0.408	1,061	0.744	1,934
20	Mechanical Room - NO ACCESS	F42EE	1x4 Box	2	1x4, 2 lamp F34T12, 1-ES ballast, no lens	2	72	0.144	2600	374		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	265	0.042	109
21	Lunch Room	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	0	144	0	2600	0	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	0	0	0	0	0.000	0
22	Bulpen - Main Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	4	144	0.576	2600	1,498	WS	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	4	59	0.236	614	0.340	884
22.1	Closet	F42EE	1x4 wrap	2	1x4 2 lamp 34W ES balast wrap	1	72	0.072	780	56		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	40	0.021	16
22.2	Bulpen - Main Office RR	F42EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	72	0.072	2600	187		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.021	55
24	Work Area	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	28	123	3.444	2600	8,954	AB	Retrofit	F44ILL		4	4 F32T8 lamps, 2 2 lamp low watt electronic ballast, conversion kit, new sockets	28	102	2.856	7,426	0.588	1,529

Contractor As-Built Savings
08. ISD District 3 Facilities Operation

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
26	Parts Room	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	6	144	0.864	2600	2,246		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	6	51	0.306	796	0.558	1,451
27	Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, broken lens	4	144	0.576	2600	1,498	1G	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	4	59	0.236	614	0.340	884
29	Open Area	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	19	123	2.337	2600	6,076	AB	Retrofit	F44ILL		4	4 F32T8 lamps, 2 2 lamp low watt electronic ballast, conversion kit, new sockets	19	102	1.938	5,039	0.399	1,037
30	Open Area	F44EE	1x8 strip	4	1x8, 4 lamp F34T12, strip	2	144	0.288	2600	749		Retrofit	F44ILL		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, new sockets	2	102	0.204	530	0.084	218
31	Office	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	2	144	0.288	2600	749		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	265	0.186	484
31.1	Warehouse	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	144	0.144	2600	374		Retrofit	F42ILL-R		4	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.093	242
31.2	Warehouse	F44EE	1x4 Wrap	4	1x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	144	0.144	2600	374		Retrofit	F42ILL-R		4	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.093	242
33	Open Area	F82EHE	1x8 strip	2	1x8, 2 lamp 95W HO, strip (11-14 fc)	81	207	16.767	2600	43,594		Retrofit	F44ILL		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, conversion kit, new sockets	81	102	8.262	21,481	8.505	22,113
34	Work Bench	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	4	123	0.492	2600	1,279		Retrofit	F44ILL		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, conversion kit, new sockets	4	102	0.408	1,061	0.084	218
35	Parts Room	F42EE	1x4 Strip	2	1x4, 2 lamp F34T12, 1-ES ballast	7	72	0.504	2600	1,310	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	7	51	0.357	928	0.147	382
36	Mechanical/Tool Room	F42EE	1x4 Box	2	1x4, 2 lamp F34T12, 1-ES ballast, no lens	8	72	0.576	2600	1,498	WS	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	8	51	0.408	1,061	0.168	437
37	Mechanical/Tool Room - NO ACCESS	F42EE	1x4 Box	2	1x4, 2 lamp F34T12, 1-ES ballast, no lens	4	72	0.288	2600	749	WS	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	4	51	0.204	530	0.084	218
38	Plans/Blueprint Room	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, broken lens	3	144	0.432	2600	1,123	1G	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	3	59	0.177	460	0.255	663

Contractor As-Built Savings
08. ISD District 3 Facilities Operation

		Existing Fixtures										New Fixtures								Savings			
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
39	Tools/Parts Room	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	2	123	0.246	2600	640	WS	Retrofit	F44ILL		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, conversion kit, new sockets	2	102	0.204	530	0.042	109	
40	Tool Room	F42EE	1x4 Strip	2	1x4, 2 lamp F34T12, 1-ES ballast	2	72	0.144	2600	374	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	265	0.042	109	
40.1	Tank Room	F42EE	1x4 surface Troffer	2	1x4, 2 lamp F34T12, 1-ES ballast	4	72	0.288	2600	749	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	4	51	0.204	530	0.084	218	
																Total T12-T8	301				21.455	55,576	
14	Closet	I60/2	Drum	2	Drum, 2 lamp, 60W, no lens	1	120	0.12	780	94		Retrofit	CFQ18/2-L		2	19 watt compact fluorescent lamp	1	38	0.038	30	0.082	64	
16	Men's Restroom	I60/2	Drum	2	Drum, 2 lamp, 60W, opal lens	4	120	0.48	780	374		Retrofit	CFQ18/2-L		2	19 watt compact fluorescent lamp	4	38	0.152	119	0.328	256	
18	Women's Restroom	I60/3	Drum	1	Drum, 2 lamp, 60W, opal lens	3	60	0.18	780	140		Retrofit	CFQ18/1-L		1	19 watt compact fluorescent lamp	3	19	0.057	44	0.123	96	
22.3	Bulpen - Main Office RR	I60/1	Recessed Downl	1	1 lamp 60W A19	1	60	0.06	2600	156		Retrofit	CFQ18/1-L		1	19 watt compact fluorescent lamp	1	19	0.019	49	0.041	107	
25	Tire Storage	I60/1	Jelly Jar	1	Jelly Jar, explosion proof, 60W, lens missing	4	60	0.24	2600	624		Retrofit	CFQ18/1-L		1	19W compact fluorescent lamp	4	19	0.076	198	0.164	426	
																Total INCAN	13				0.738	949	
Total						315		45.816		117,309			Total						314	24	60,785	21.824	56,524

Aloha Systems Measured Savings
08. ISD Distric 3 Facilities Operation

Aloha Systems Measured Savings																							
08. ISD Distric 3 Facilities Operation																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
6	Bullpen #2	EITT	Exit Sign	0	Exit - Tritium	0	0	0.000	0	0	0	No Change	EITT		0	No Change	0	0	0.000	0	0.000	0	
																Total Exits	0					0.000	0
1	Bullpen Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	53	144	7.632	3,233	24,674	Multi	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	53	59	3.127	10,110	4.505	14,565	
2	Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	4	144	0.576	2,600	1,498	WS	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	4	59	0.236	614	0.340	884	
2.1	Closet	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 1-ES ballast, prismatic lens	1	144	0.144	780	112		Retrofit	F42ILL-R		2	F32T8 lamps, 2 1 lamp low watt electronic ballast, new sockets	1	51	0.051	40	0.093	73	
3	Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	2	144	0.288	2,600	749	1G	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	2	59	0.118	307	0.170	442	
4	Bullpen #2	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	16	144	2.304	3,233	7,449	AB	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	16	59	0.944	3,052	1.360	4,397	
5	Bullpen #2	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34T12/U6, 1-ES ballast, prismatic lens	4	72	0.288	3,233	931	AB	Retrofit	F42ILL-R		2	FB32T8 lamps, 2 1 lamp low watt electronic ballast, new sockets	4	51	0.204	660	0.084	272	
7	Custodial Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	3	144	0.432	2,600	1,123		Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	3	59	0.177	460	0.255	663	
8	Custodial Office	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34T12/U6, 1-ES ballast, prismatic lens	1	72	0.072	2,600	187	AB	Retrofit	F42ILL-R		2	FB32T8 lamps, 2 1 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.021	55	
9	Closet	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, 1-ES ballast, prismatic lens	1	72	0.072	2,600	187		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	133	0.021	55	
10	Locksmith- NO ACCESS	F44EE	1x4 Wrap	4	1x4, 4 lamp F34T12, 1-ES ballast, prismatic lens	10	144	1.440	2,600	3,744		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	10	51	0.510	1,326	0.930	2,418	

Aloha Systems Measured Savings
08. ISD Distric 3 Facilities Operation

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
10.1	Locksmith- NO ACCESS	F82EE	1x8 Strip	4	1x8, 2 lamp F96 60W, ES ballast, strip fixture	4	123	0.492	2,600	1,279		Retrofit	F44ILL-R		4	4F32T8 lamps, 1 low watt 2 lamp electronic ballast, conversion kit	4	102	0.408	1,061	0.084	218
11	Locked Doors- NO ACCESS	F42EE	1x4 Wrap	1	1x4, 2 lamp F34T12, 1-ES ballast, prismatic lens actually vandal resistant wall pack 13W	0	72	0.000	2,600	0		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	0	59	0.000	0	0.000	0
12	Hall	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	4	144	0.576	3,233	1,862		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	4	51	0.204	660	0.372	1,203
13	Hall	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	2	144	0.288	3,233	931		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	330	0.186	601
15	Men's Restroom	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	144	0.144	3,233	466		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	165	0.093	301
17	Women's Restroom	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, 1-ES ballast, prismatic lens	1	72	0.072	3,233	233		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	165	0.021	68
19	Lunch Room	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	8	144	1.152	3,188	3,673	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	8	51	0.408	1,301	0.744	2,372
20	Mechanical Room - NO ACCESS	F42EE	1x4 Box	2	1x4, 2 lamp F34T12, 1-ES ballast, no lens	2	72	0.144	2,600	374		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	265	0.042	109
21	Lunch Room	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	0	144	0.000	3,188	0	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	0	0	0.000	0	0.000	0
22	Bulpen - Main Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	4	144	0.576	3,233	1,862	WS	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	4	59	0.236	763	0.340	1,099
22.1	Closet	F42EE	1x4 wrap	2	1x4 2 lamp 34W ES balast wrap	1	72	0.072	780	56		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	40	0.021	16
22.2	Bulpen - Main Office RR	F42EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	72	0.072	3,233	233		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	165	0.021	68
24	Work Area	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	28	123	3.444	2,970	10,229	AB	Retrofit	F44ILL-R		4	4 F32T8 lamps, 2 2 lamp low watt electronic ballast, conversion kit, new sockets	28	102	2.856	8,482	0.588	1,746

Aloha Systems Measured Savings
08. ISD Distric 3 Facilities Operation

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
26	Parts Room	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	6	144	0.864	2,970	2,566		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	6	51	0.306	909	0.558	1,657
27	Office	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, broken lens	4	144	0.576	2,970	1,711	1G	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	4	59	0.236	701	0.340	1,010
29	Open Area	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	19	123	2.337	2,970	6,941	AB	Retrofit	F44ILL-R		4	4 F32T8 lamps, 2 2 lamp low watt electronic ballast, conversion kit, new sockets	19	102	1.938	5,756	0.399	1,185
30	Open Area	F44EE	1x8 strip	4	1x8, 4 lamp F34T12, strip	2	144	0.288	2,970	855		Retrofit	F44ILL-R		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, new sockets	2	102	0.204	606	0.084	249
31	Office	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	2	144	0.288	2,970	855		Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	303	0.186	552
31.1	Warehouse	F44EE	2x4 Wrap	4	2x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	144	0.144	7,131	1,027		Retrofit	F42ILL-R		4	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	364	0.093	663
31.2	Warehouse	F44EE	1x4 Wrap	4	1x4, 4 lamp F34T12, 2-ES ballast, prismatic lens	1	144	0.144	7,131	1,027		Retrofit	F42ILL-R		4	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	1	51	0.051	364	0.093	663
33	Open Area	F82EHE	1x8 strip	2	1x8, 2 lamp 95W HO, strip (11-14 fc)	75	207	15.525	7,131	110,709		Retrofit	F44ILL-R		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, conversion kit, new sockets	75	102	7.650	54,552	7.875	56,157
34	Work Bench	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	4	123	0.492	2,970	1,461		Retrofit	F44ILL-R		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, conversion kit, new sockets	4	102	0.408	1,212	0.084	249
35	Parts Room	F42EE	1x4 Strip	2	1x4, 2 lamp F34T12, 1-ES ballast	7	72	0.504	2,970	1,497	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	7	51	0.357	1,060	0.147	437
36	Mechanical/Tool Room	F42EE	1x4 Box	2	1x4, 2 lamp F34T12, 1-ES ballast, no lens	8	72	0.576	2,970	1,711	WS	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	8	51	0.408	1,212	0.168	499
37	Mechanical/Tool Room - NO ACCESS	F42EE	1x4 Box	2	1x4, 2 lamp F34T12, 1-ES ballast, no lens	4	72	0.288	2,970	855	WS	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	4	51	0.204	606	0.084	249
38	Plans/Blueprint Room	F44EE	2x4 Rec Troffer	4	2x4, 4 lamp F34T12, 2-ES ballast, broken lens	3	144	0.432	2,970	1,283	1G	Retrofit	F42ILL		2	F32T8/741K lamps, 1 2 lamp standard electronic ballast, new sockets	3	59	0.177	526	0.255	757

Aloha Systems Measured Savings
08. ISD Distric 3 Facilities Operation

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
39	Tools/Parts Room	F82EE	1x8 strip	2	1x8, 2 lamp 60W, strip	2	123	0.246	2,970	731	WS	Retrofit	F44ILL-R		4	4 F32T8 lamps, 1 4 lamp low watt electronic ballast, conversion kit, new sockets	2	102	0.204	606	0.042	125	
40	Tool Room	F42EE	1x4 Strip	2	1x4, 2 lamp F34T12, 1-ES ballast	2	72	0.144	2,970	428	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	2	51	0.102	303	0.042	125	
40.1	Tank Room	F42EE	x4 surface Troffe	2	1x4, 2 lamp F34T12, 1-ES ballast	4	72	0.288	2,970	855	1G	Retrofit	F42ILL-R		2	2 F32T8 lamps, 1 2 lamp low watt electronic ballast, new sockets	4	51	0.204	606	0.084	249	
Total T12-T8																	295				20.825	96,452	
14	Closet	I60/2	Drum	2	Drum, 2 lamp, 60W, no lens	1	120	0.120	780	94		Retrofit	CFQ18/1-L		2	19 watt compact fluorescent lamp	1	38	0.038	30	0.082	64	
16	Men's Restroom	I60/2	Drum	2	Drum, 2 lamp, 60W, opal lens	4	120	0.480	2,970	1,426		Retrofit	CFQ18/1-L		2	19 watt compact fluorescent lamp	4	38	0.152	451	0.328	974	
18	Women's Restroom	I60/2	Drum	1	Drum, 2 lamp, 60W, opal lens	3	60	0.180	2,970	535		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	3	19	0.057	169	0.123	365	
22.3	Bulpen - Main Office RR	I60/1	cessed Downlight	1	1 lamp 60W A19	1	60	0.060	3,233	194		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	1	19	0.019	61	0.041	133	
25	Tire Storage	I60/1	Jelly Jar	1	Jelly Jar, explosion proof, 60W, lens missing	4	60	0.240	2,970	713		Retrofit	CF18/1-SCRW		1	19W compact fluorescent lamp	4	19	0.076	226	0.164	487	
Total INCAN																	13				0.738	2,023	
Total						308		44.496		199,325			Total						308	23	100,850	21.563	98,475

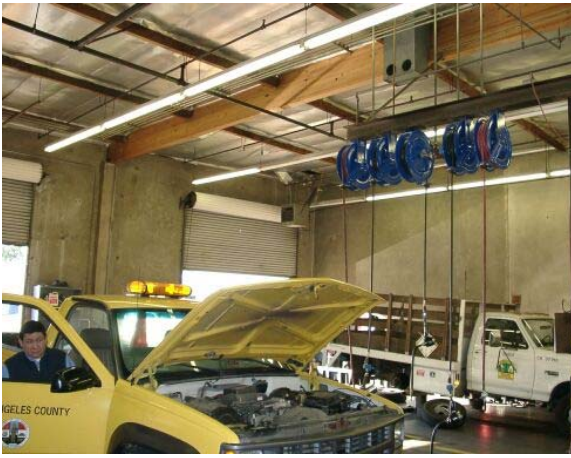
ISD - Dist. 3 Facilities Operations – 11236 Playa Ct., Culver City



Front Office, Bullpen Fluorescent Lights



ISD - Dist. 3 Facilities Building



Auto Repair Shop Fluorescent Lights



Warehouse, Shop HO Fluorescent Lights

Site Measurement and Verification Report

Site Number 9

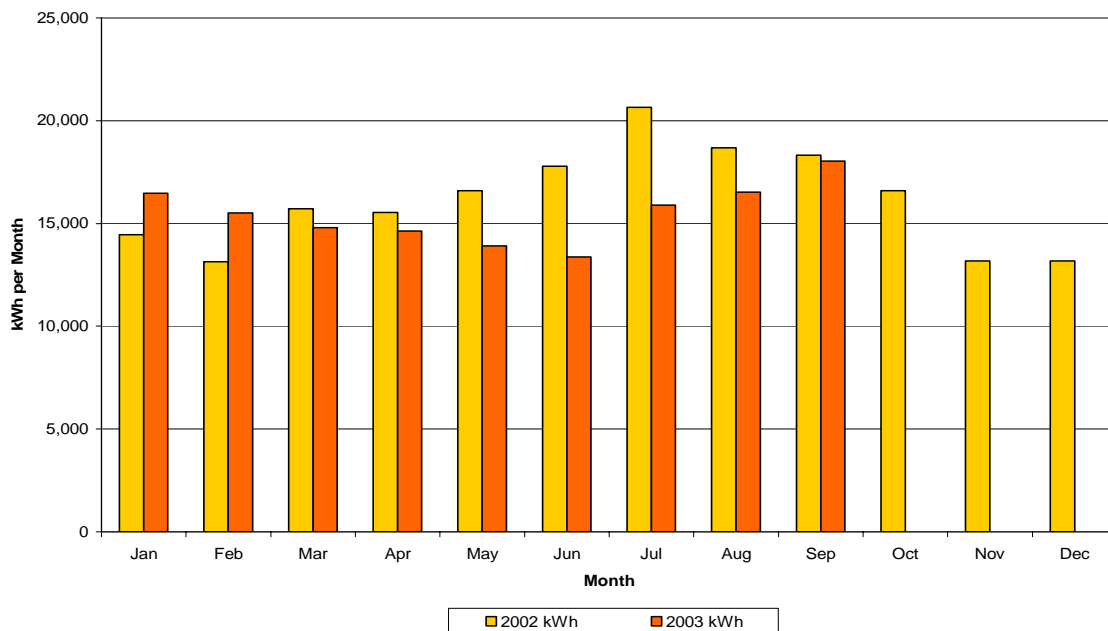
Sheriff Field Operations Region II
3010 E. Victoria Street, Rancho Dominguez
SCE Account 3-001-4064-11

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	148,359 kWh
Contractor's As-Built Estimate	51,187 kWh
<i>Ex-Ante</i> Evaluation	43,320 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	68,759 kWh

Site Description

The Sheriff Field Operations Region II is a two-story building used for the anti-gang units. It has a variety of small offices, bullpen areas both upstairs and downstairs, a conference room; break room, and rest rooms. Southern California Edison supplies the facility at 208/120 volts through meter PO801-002625. Its annual energy consumption in 2002 was 193,830 kWh, and its peak demand was 63 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

Sheriff Field Operations Region 2



The downstairs portion of the building is operational Monday-Thursday from 9:00 a.m. to 5:00 p.m., sometimes working later if workload dictates. All lights were on at the time, but we were told that the reason for this was that the lighting contractor had left them on after doing his comprehensive survey and did not turn them off afterwards. Normally, according to a worker, the lights are off on Fridays. Only people actually working have their lights on. The upstairs offices were in a reduced operating state during the audit.

Spreadsheet Errors

The spreadsheets were presented to us with direct values rather than formulas. Upon conversion to formulas, occasionally the rows did not multiply correctly and occasionally the rows did not add exactly to the reported total. Often this was the case when “no change” was reported because of the use of zero quantities. We corrected these problems by setting both the “existing” and “new” quantities to zero for any line item in which there were not fixtures changes. This will allow both the fixture and kWh sums to accurately represent the project. The purpose of the lighting spreadsheets is not to document every light in the facility, but rather to document only those that were retrofitted.

Changes made as a result of correcting the contractor’s spreadsheet errors are highlighted in lavender on Aloha’s “metered” spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor’s as-built spreadsheet.

Preliminary Site Visit

The site was visited on February 21, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts in 12% of the fixtures and 88% standard magnetic ballasts. The lamps used are a mixture of 34W and 40W bulbs. Existing fixture wattage values were adjusted in the spreadsheet to account for these ratios of energy-saving and standard lamps and ballasts.

One discrepancy was discovered. The spreadsheet had a count of 11 for the 2x2 hallway fixtures but we counted 12. These discrepancies were pointed out to LA County staff. The as-built spreadsheets from the installation contractor corrected for incorrect count on the 2x2 hallway fixtures.

Post-Retrofit Audit

The site was again visited on July 25, 2003. We specifically re-verified the observations noted during the preliminary site visit. All the retrofits were accurate when compare to the as-built spreadsheet.

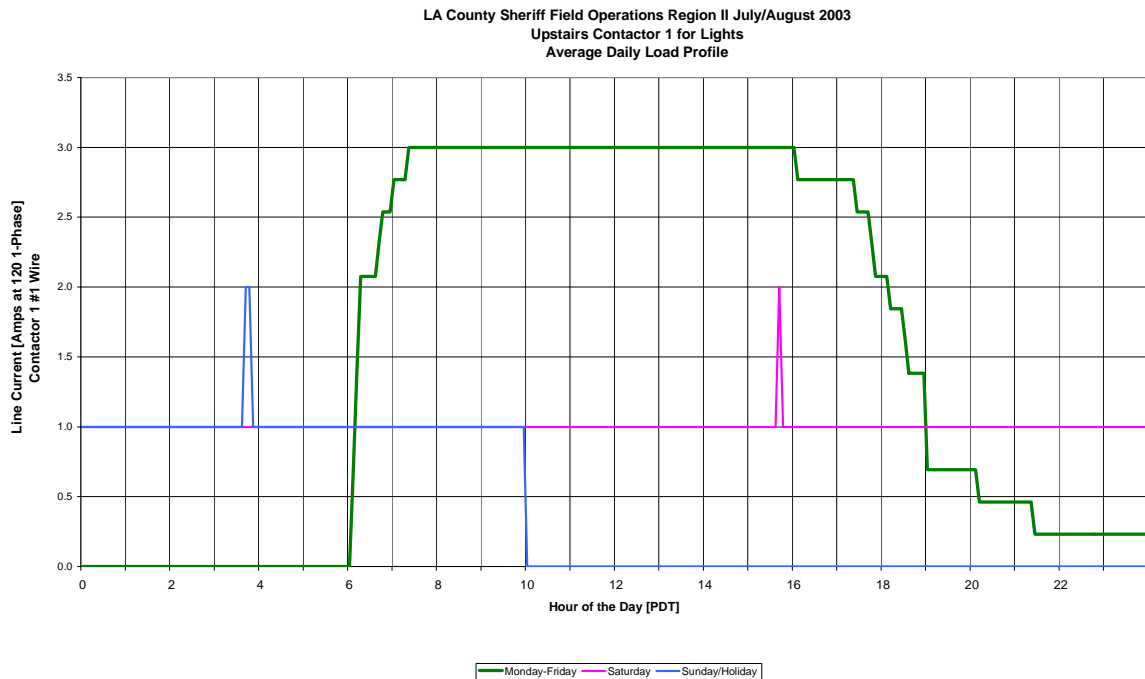
One discrepancy noted, on the as built spreadsheet it said 9 fixtures were installed in the MCAD bullpen. We counted 10 fixtures.

Metered Load Profiles

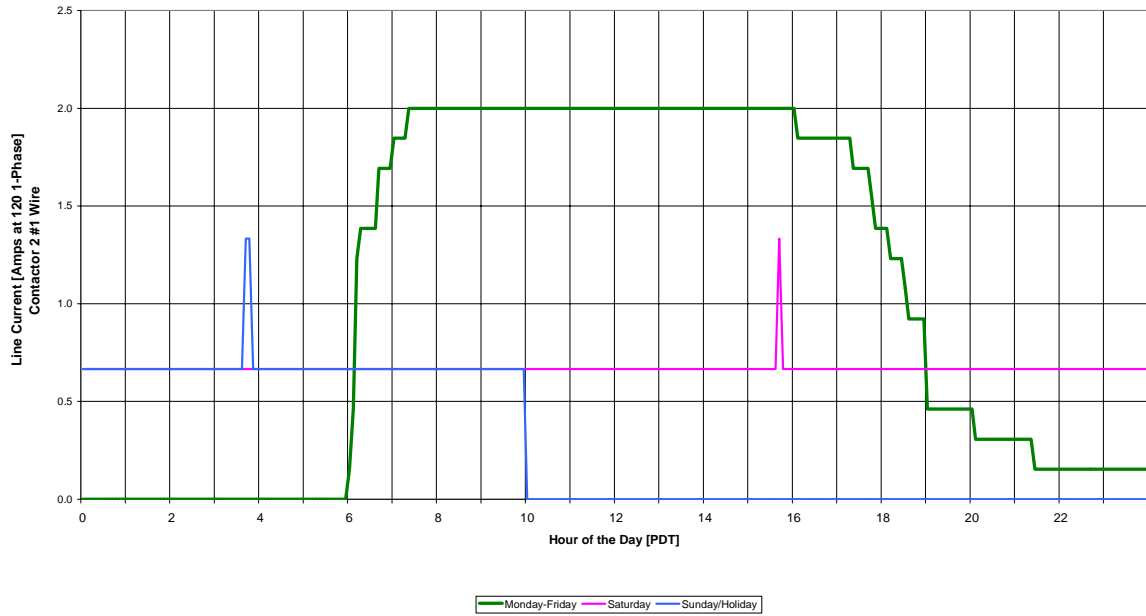
Although the facility is occupied and operational on a continuous basis, many areas are not in fact used throughout the night and weekends. We collected interval data for lighting loads in three locations. We selected loads that were either variable or were not certain to operate 24 hours per day. Those areas where continuous operation was indicated by local staff were assumed to operate in that manner due to the nature of the facility. The three lighting areas on which we collected data were:

- Upstairs Bullpen
- Lunch Room
- Downstairs Bullpen

Upstairs Bullpen: The upstairs bullpen lights are in use during the weekday from 7:00 a.m. to 5:00 p.m. During the weekend the upstairs bullpen lights are usually off. The weekend load seen in both profiles on the following page is attributed to the lights being on a full 24 hours on a Saturday and ten hours on a Sunday. The full load equivalent operating time is 3,790 hours per year as verified by the load profiles of the two contactors. (One contactor demonstrated 3,788 h/yr and the other 3,791 h/yr because of recording differences of the two meters.) The contractor as-built spreadsheet has full load equivalent operating time of 2868 hours per year.

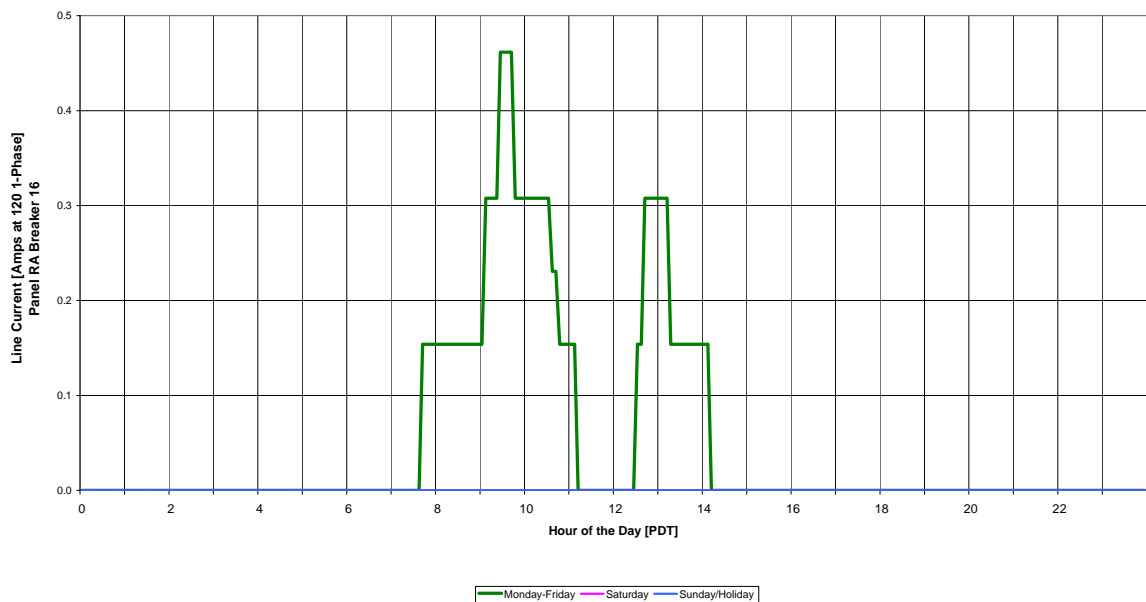


LA County Sheriff Field Operations Region II July/August 2003
 Upstairs Contactor 2 for Lights
 Average Daily Load Profile

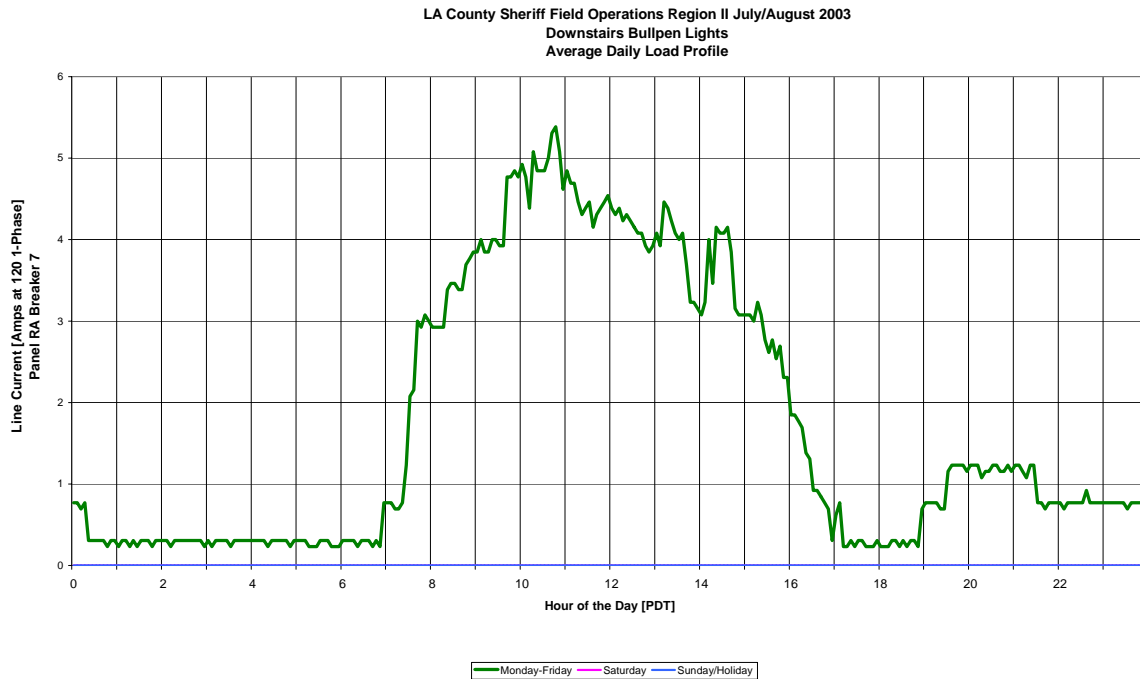


Lunch Room: The lunchroom lights operate sporadically in intervals from one to two hours per day from 8:00 a.m. to 11:00 a.m. and 12:30 p.m. to 2:00 p.m. during the week. Some days the lights are not used at all, and the average daily usage is less than one hour. The full load equivalent operating time is 148 hours per year. The contractor as-built spreadsheet has a full load equivalent operating time of 2868 hours per year.

LA County Sheriff Field Operations Region II July/August 2003
 Lunch Room Lights
 Average Daily Load Profile



Downstairs Bullpen: The downstairs bullpen lights are on from 8:00 a.m. to 4:00 p.m. Monday thru Friday. The operating schedule is consistent with the operating hours shown on the load profiles for both the upstairs and downstairs bullpen. The main difference is that the downstairs lights have more individual control. The early morning and late night loads are attributed to a Monday and a Tuesday when lights were left on during the day and night. The full load operating time for the downstairs bullpen is 1834 hours per year. The contractor as-built spreadsheet has a full load equivalent operating time of 2868 hours per year.



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. The contractor used 2,868 hours per year as a generic value for all locations of the building. This is approximately midway between the measured 3,790 h/yr for the group-controlled upstairs bullpen and the 1,834 h/yr for the downstairs bullpen where the lights are used less and are more easily controlled individually. We consider it to be a reasonable estimate of individual office lighting use and left it unchanged in these areas.

If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

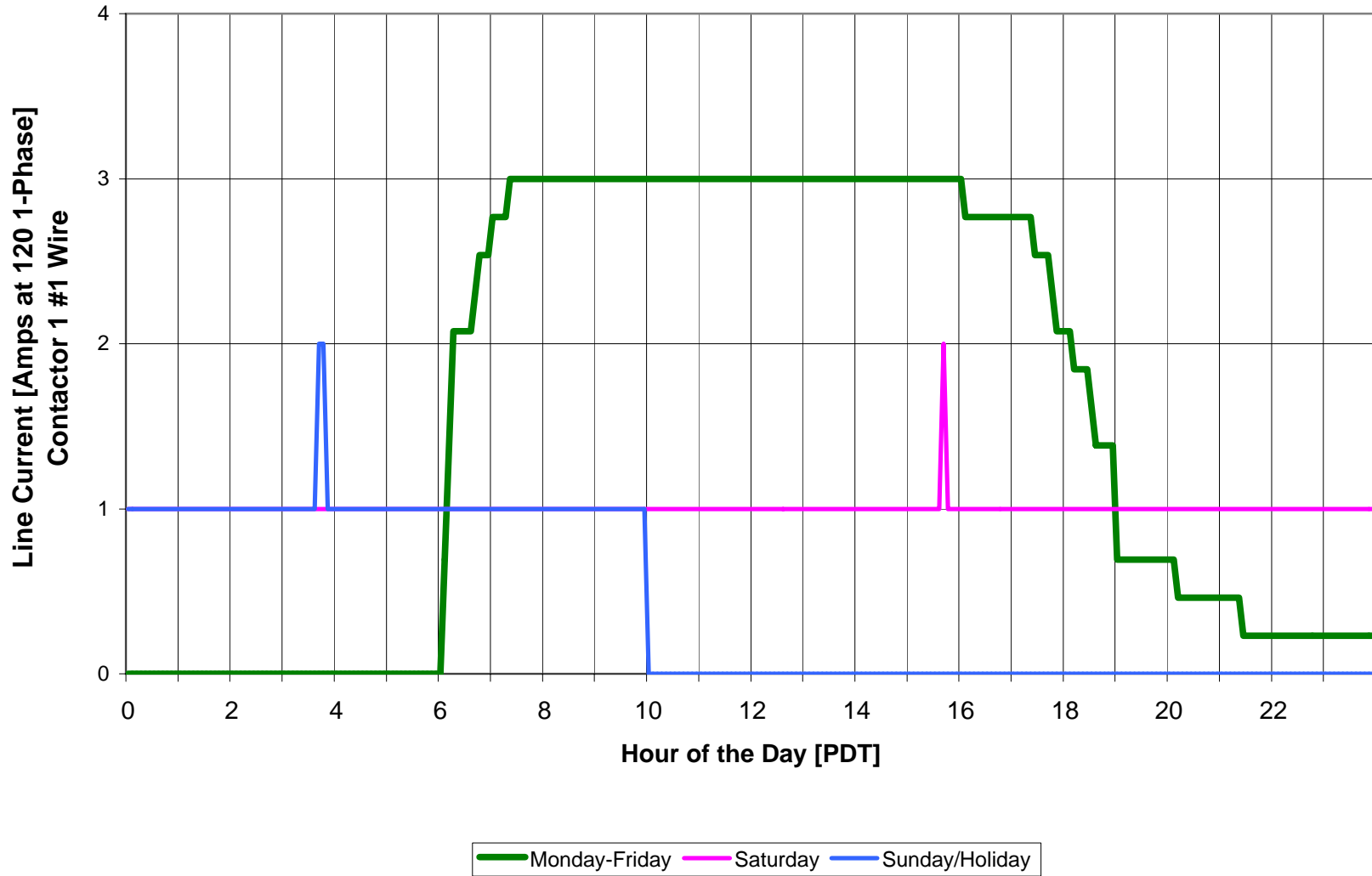
The following table delineates the savings at this site for each of the measure types included in the program.

Sheriff Field Operations Region II Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	9	2,825	6	1,448	2,165	1,866
T12 to T8	219	144,816	232	48,626	40,050	65,449
Inc to CFL	2	718	7	1,113	1,105	1,444
Total	230	148,359	245	51,187	43,320	68,759

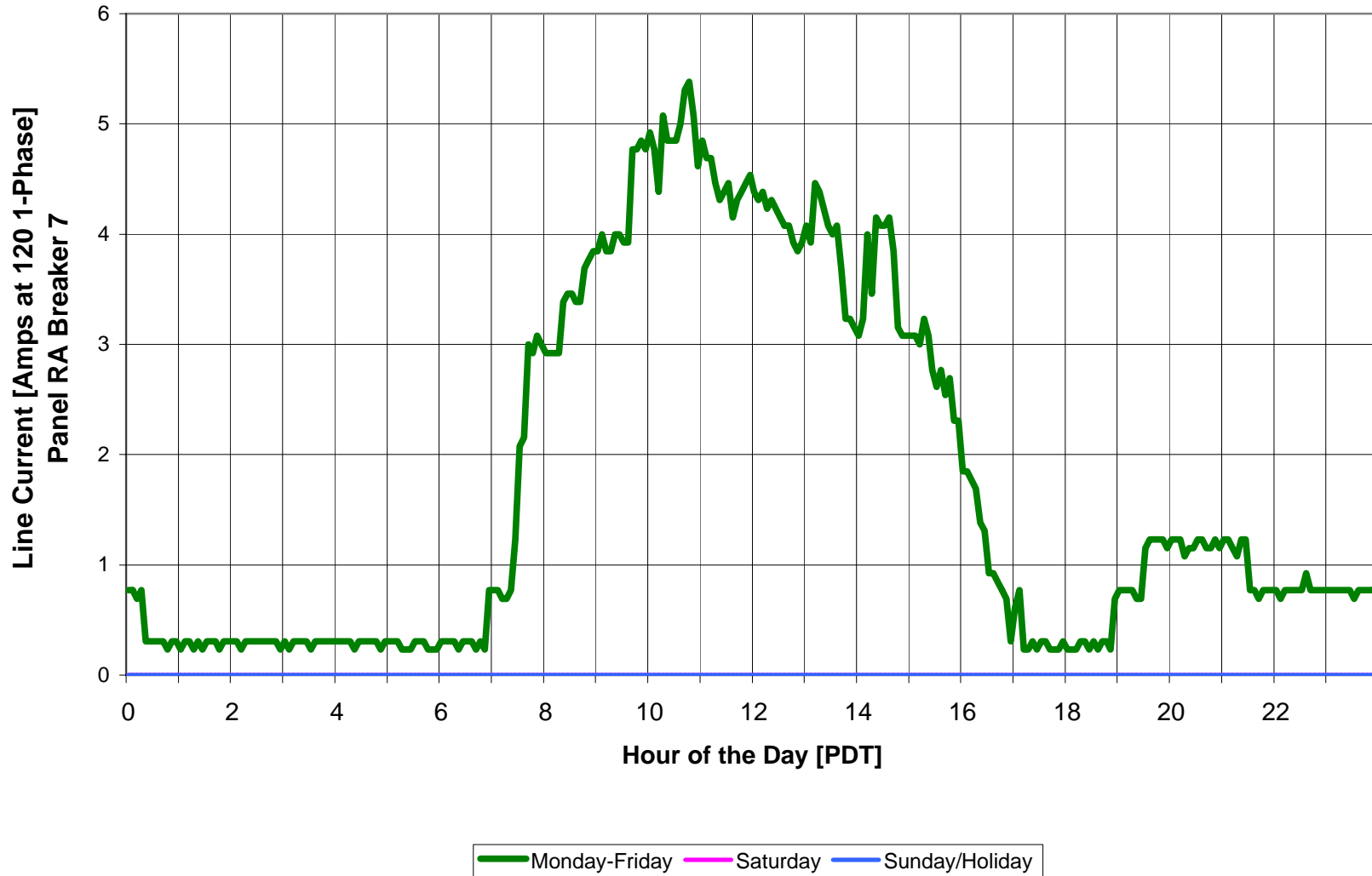
The original proposed savings estimate is much higher than the contractor’s final estimate or the *ex-ante* and *ex-post* savings estimate primarily because this facility was assumed to operate on a twenty-four hour per day basis. The contractor’s estimate is lower than the *ex-post* measurement because we found longer operating hours in some areas and also gave credit for pre-existing “standard” lamps and ballasts. The *ex-ante* evaluation is lower than these other values because the fixtures in this facility actually saved more energy per fixture than the project-wide average amount.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

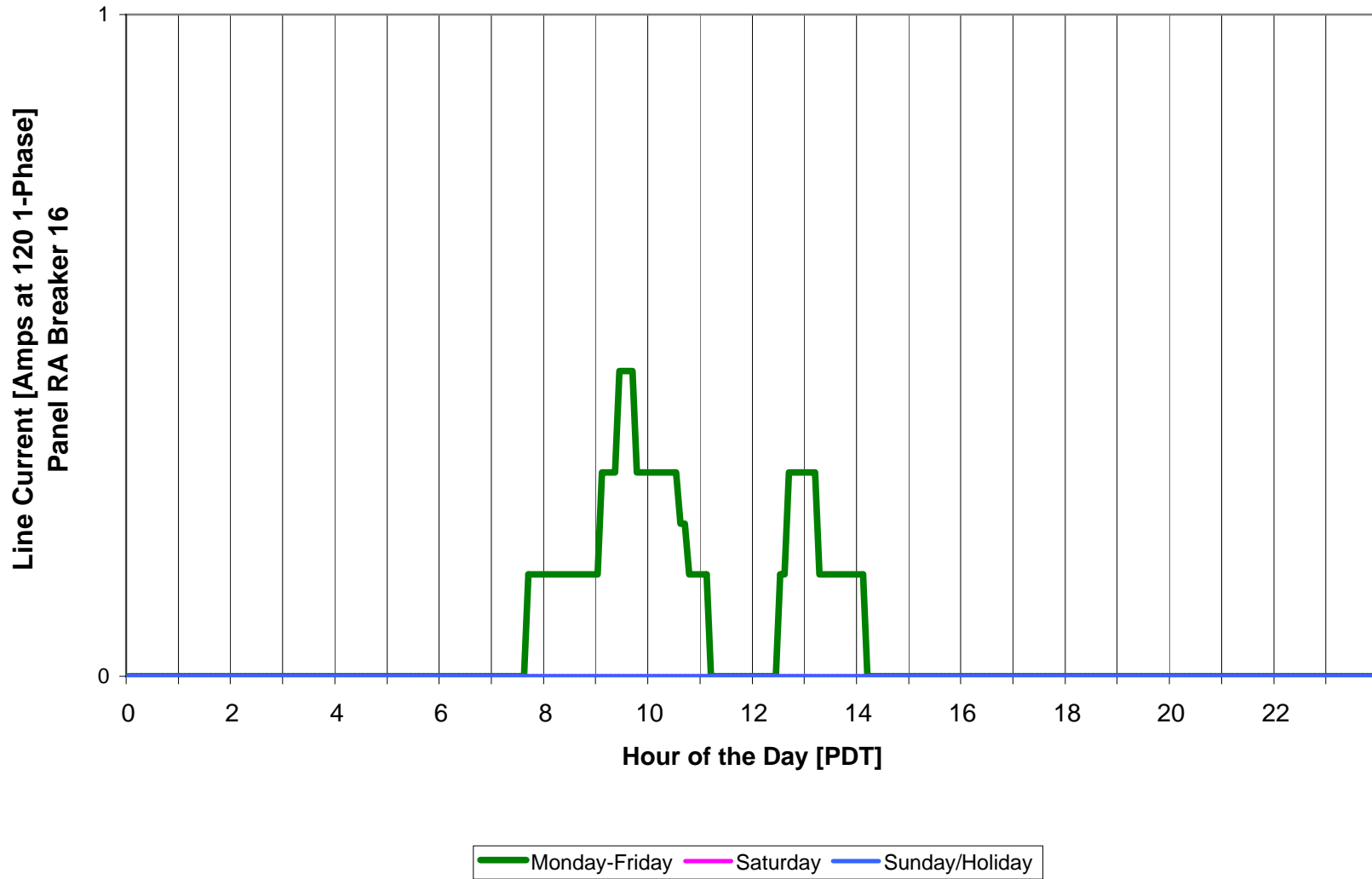
LA County Sheriff Field Operations Region II July/August 2003
Upstairs Contactor 1 for Lights
Average Daily Load Profile



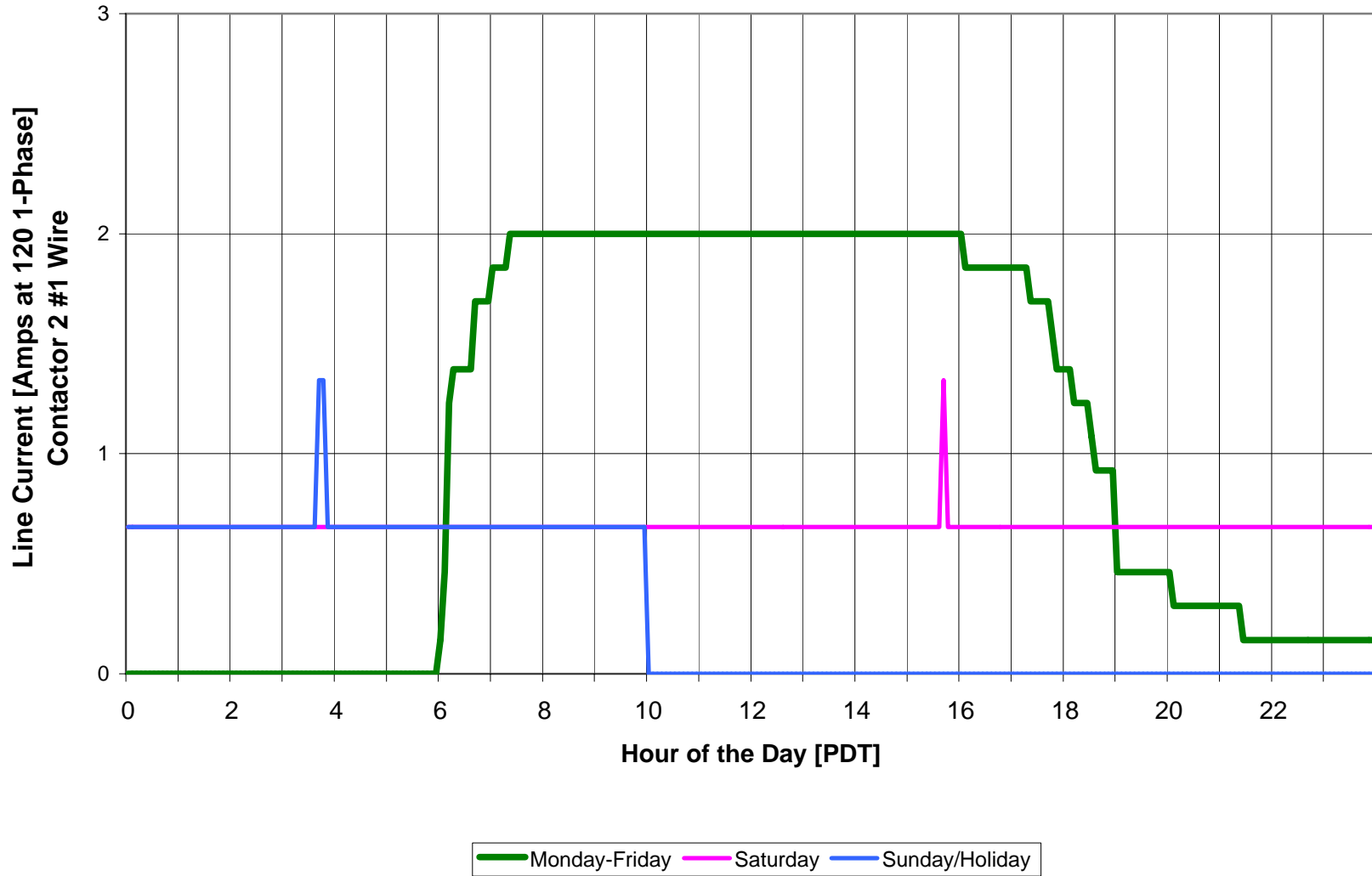
LA County Sheriff Field Operations Region II July/August 2003
Downstairs Bullpen Lights
Average Daily Load Profile



LA County Sheriff Field Operations Region II July/August 2003
Lunch Room Lights
Average Daily Load Profile



LA County Sheriff Field Operations Region II July/August 2003
Upstairs Contactor 2 for Lights
Average Daily Load Profile



Contractor As-Built Savings
09. Sheriff Field Operations Region II

Contractor As-Built Savings																						
09. Sheriff Field Operations Region II																						
Exitsting Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
49	Exterior		Wall Pack	1	UNKNOWN	6		0.000		0		NO CHANGE	-			NO CHANGE	0		0	0	0.000	0
																Total HID	0				0.000	0
19	Stairwell #2	EI20/2	Exit	2	2 lamp 20W T6 1/2 exit sign	3	40	0.120	8760	1,051	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	3	4.5	0.0135	118	0.107	933
33	Egress Door	EI20/2	Exit	2	2 lamp 20W T6 1/2 exit sign	1	40	0.040	8760	350	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	4.5	0.0045	39	0.036	311
45	Hallway	EI20/2	Exit	2	2 lamp 20W T6 1/2 exit sign	2	40	0.080	2868	229	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	2	4.5	0.009	26	0.071	204
																Total Exits	6				0.213	1,448
2	Bulpen	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	70	144	10.080	2868	28,909	Contactors	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	70	59	4.13	11,845	5.950	17,065
3	Computer Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.368	1,055
4	Room next to computer room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	144	0.432	2868	1,239	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	447	0.276	792
5	Coffee Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	144	0.432	2868	1,239	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	447	0.276	792
6	Womens Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	72	0.288	2868	826	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.080	229

Contractor As-Built Savings
09. Sheriff Field Operations Region II

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
8	Men's Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	72	0.288	2868	826	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.080	229	
9	Room next to Men's Room - NO ACCESS	F42EE	ESTIMATE - Troffer	2	ESTIMATE - 1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	72	0.288	2868	826	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.080	229	
10	Room 204	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	144	0.288	2868	826	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.184	528	
11	Room 203	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	144	0.288	2868	826	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.184	528	
12	Stairwell #1	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.368	1,055	
13	Room 202 - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	5	144	0.720	2868	2,065	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.26	746	0.460	1,319	
14	Room 218 - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.368	1,055	
15	Room 217	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.368	1,055	
16	Room 216	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.368	1,055	
18	Stairwell #2	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	72	0.216	2868	619	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	447	0.060	172	
21	Electric Room	F44EE	Strip	4	1x8, 4 lamp 34W, 2 ES ballast, chain hung	1	144	0.144	780	112	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	1	102	0.102	80	0.042	33	
22	MCAD Bullpen	FU2EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	7	72	0.504	2868	1,445	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	1,044	0.140	402	
23	MCAD Bullpen	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	9	144	1.296	2868	3,717	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,342	0.828	2,375	

Contractor As-Built Savings
09. Sheriff Field Operations Region II

Contractor As-Built Savings																						
09. Sheriff Field Operations Region II																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
24	Office #1	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	4	52	0.208	597	0.368	1,055
25	Office #2	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	144	0.288	2868	826	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.184	528
26	Office #3	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	144	0.288	2868	826	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.184	528
27	Office #4	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	4	52	0.208	597	0.368	1,055
28	Office #5	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	1	144	0.144	2868	413	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	1	52	0.052	149	0.092	264
29	Team Member Area	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	16	144	2.304	2868	6,608	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	16	52	0.832	2,386	1.472	4,222
30	Team Office #1	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	144	0.288	2868	826	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.184	528
31	Team Office #2	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	144	0.288	2868	826	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.184	528
32	Locker Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	144	0.432	2868	1,239	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	3	52	0.156	447	0.276	792
34	Conference Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	12	144	1.728	2868	4,956	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	12	52	0.624	1,790	1.104	3,166
35	Room 111 - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	144	0.576	2868	1,652	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	4	52	0.208	597	0.368	1,055
36	Copier Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	72	0.144	2868	413	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	298	0.040	115
37	Exercise Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	6	144	0.864	2868	2,478	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	895	0.552	1,583

Contractor As-Built Savings
09. Sheriff Field Operations Region II

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
39	Break Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	6	144	0.864	2868	2,478	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	6	52	0.312	895	0.552	1,583	
40	Men's Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	72	0.216	2868	619	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	447	0.060	172	
42	Women's Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	5	72	0.360	2868	1,032	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.26	746	0.100	287	
43	Telephone Room	F82EE	Strip	2	1x8, 2 lamp F96 60W, ES ballast, surface mount	1	123	0.123	780	96	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast, conversion kit	1	59	0.059	46	0.064	50	
44	Room next to Phone Room - NO ACCESS	F42EE	ESTIMATE - Troffer	2	ESTIMATE - 1x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	8	72	0.576	2868	1,652	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	1,193	0.160	459	
46	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	12	72	0.864	2868	2,478	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	12	52	0.624	1,790	0.240	688	
																Total T-12 to T-8	232				17.032	48,626	
7	Roof access	I60/1	Keyless	1	1 lamp 60W A keyless	1	60	0.060	2868	172	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	1	19	0.019	54	0.041	118	
17	Room 215 - NO ACCESS	I65/1	ESTIMATE - Troffer	1	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser actually 65W keyless	1	65	0.065	2868	186	None	Retrofit	CFQ18/1-L		1	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	19	0.019	54	0.046	132	
38	Exercise Room	I60/1	Square	1	1 lamp 60W A recessed	1	60	0.060	2868	172	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	1	19	0.019	54	0.041	118	
41	Room next to Men's Room - NO ACCESS	I60/1	ESTIMATE - Troffer	1	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser actually 1 lamp 60W keyless	1	60	0.060	2868	172	None	Retrofit	CFQ18/1-L		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	19	0.019	54	0.041	118	
47	Lobby	CFQ26/1	Can	1	26W compact fluorescent lamp, recessed	6	26	0.156	2868	447	None	NO CHANGE	CFQ26/1		2	NO CHANGE	0	26	0.156	447	0.000	0	

Contractor As-Built Savings
09. Sheriff Field Operations Region II

Contractor As-Built Savings																						
09. Sheriff Field Operations Region II																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
48	Exterior	I100/1	Canopy	1	1 lamp 100W ceiling mount	3	100	0.300	2868	860	None	Retrofit	CFQ26/1		1	27W compact fluorescent spring lamp	3	27	0.081	232	0.219	628
																Total INCAN to Compact	7				0.388	1,113
Total						257		30.584		88,100						Total	245		12.951	36,913	17.633	51,187

Aloha Systems Measured Savings
09. Sheriff Field Operations Region II

Aloha Systems Measured Savings 09. Sheriff Field Operations Region II																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
49	Exterior		Wall Pack	1	UNKNOWN	0		0.000		0		NO CHANGE				NO CHANGE	0		0.000	0	0.000	0
																Total HID	0				0.000	0
19	Stairwell #2	EI20/2	Exit	2	2 lamp 20W T6 1/2 exit sign	3	40	0.120	8,760	1,051	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	3	4.5	0.014	118	0.107	933
33	Egress Door	EI20/2	Exit	2	2 lamp 20W T6 1/2 exit sign	1	40	0.040	8,760	350	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	4.5	0.005	39	0.036	311
45	Hallway	EI20/2	Exit	2	2 lamp 20W T6 1/2 exit sign	2	40	0.080	8,760	701	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	2	4.5	0.009	79	0.071	622
																Total Exits	6				0.213	1,866
2	Bulphen	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	70	163	11.417	3,790	43,270	Contactors	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	70	59	4.130	15,653	7.287	27,618
3	Computer Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.444	1,275
4	Room next to computer room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	163	0.489	2,868	1,403	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52.0000	0.156	447	0.333	956
5	Coffee Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	163	0.489	2,868	1,403	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52.0000	0.156	447	0.333	956
6	Womens Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	91	0.363	2,868	1,042	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52.0000	0.208	597	0.155	445

Aloha Systems Measured Savings
09. Sheriff Field Operations Region II

		Existing Fixtures											New Fixtures									Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
8	Men's Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	91	0.363	2,868	1,042	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.155	445	
9	Room next to Men's Room - NO ACCESS	F42EE	ESTIMATE - Troffer	2	ESTIMATE - 1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	91	0.363	2,868	1,042	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.155	445	
10	Room 204	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	163	0.326	2,868	936	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.222	637	
11	Room 203	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	163	0.326	2,868	936	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.222	637	
12	Stairwell #1	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.444	1,275	
13	Room 202 - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	5	163	0.816	2,868	2,339	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.260	746	0.556	1,593	
14	Room 218 - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.444	1,275	
15	Room 217	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.444	1,275	
16	Room 216	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	597	0.444	1,275	
18	Stairwell #2	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	82	0.246	2,868	706	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	447	0.090	259	
21	Electric Room	F44EE	Strip	4	1x8, 4 lamp 34W, 2 ES ballast, chain hung	1	173	0.173	780	135	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	1	102	0.102	80	0.071	55	
22	MCAD Bullpen	FU2EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	7	91	0.636	1,834	1,166	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	668	0.272	498	
23	MCAD Bullpen	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	9	173	1.556	1,834	2,854	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	858	1.088	1,996	

Aloha Systems Measured Savings
09. Sheriff Field Operations Region II

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
24	Office #1	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	4	52	0.208	597	0.444	1,275
25	Office #2	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	163	0.326	2,868	936	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.222	637
26	Office #3	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	163	0.326	2,868	936	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.222	637
27	Office #4	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	163	0.652	2,868	1,871	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	4	52	0.208	597	0.444	1,275
28	Office #5	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	1	163	0.163	2,868	468	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	1	52	0.052	149	0.111	319
29	Team Member Area	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	16	173	2.766	2,868	7,934	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	16	52	0.832	2,386	1.934	5,548
30	Team Office #1	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	173	0.346	2,868	992	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.242	693
31	Team Office #2	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	173	0.346	2,868	992	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	52	0.104	298	0.242	693
32	Locker Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	173	0.519	2,868	1,488	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	3	52	0.156	447	0.363	1,040
34	Conference Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	12	163	1.957	2,868	5,613	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	12	52	0.624	1,790	1.333	3,824
35	Room 111 - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	4	173	0.692	2,868	1,984	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	4	52	0.208	597	0.484	1,387
36	Copier Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	2	91	0.182	2,868	521	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	298	0.078	223
37	Exercise Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	6	173	1.037	2,868	2,975	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	895	0.725	2,080

Aloha Systems Measured Savings
09. Sheriff Field Operations Region II

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
39	Break Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	6	173	1.037	148	154	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	6	52	0.312	46	0.725	107	
40	Men's Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	3	82	0.246	2,868	706	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	447	0.090	259	
42	Women's Room	F42EE	Troffer	2	1x4, 2 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	5	82	0.411	2,868	1,177	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.260	746	0.151	432	
43	Telephone Room	F82EE	Strip	2	1x8, 2 lamp F96 60W, ES ballast, surface mount	1	163	0.163	780	127	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast, conversion kit	1	59	0.059	46	0.104	81	
44	Room next to Phone Room - NO ACCESS	F42EE	ESTIMATE - Troffer	2	ESTIMATE - 1x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser	8	82	0.657	2,868	1,884	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	1,193	0.241	691	
46	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	12	91	1.090	2,868	3,125	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	12	52	0.624	1,790	0.466	1,335	
																Total T12-T8	232				21.784	65,449	
7	Roof access	I60/1	Keyless	1	1 lamp 60W A keyless	1	60	0.060	2,868	172	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	54	0.041	118	
17	Room 215 - NO ACCESS	I65/1	ESTIMATE - Troffer	1	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser actually 65W keyless	1	65	0.065	2,868	186	None	Retrofit	F41ILL-R		1	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	19	0.019	54	0.046	132	
38	Exercise Room	I60/1	Square	1	1 lamp 60W A recessed	1	60	0.060	2,868	172	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	54	0.041	118	
41	Room next to Men's Room - NO ACCESS	I60/1	ESTIMATE - Troffer	1	ESTIMATE - 2x4, 4 lamp 34W, 2 ES ballast, recessed, prismatic diffuser actually 1 lamp 60W keyless	1	60	0.060	2,868	172	None	Retrofit	F41ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	19	0.019	54	0.041	118	
47	Lobby	CFQ26/1	Can	1	26W compact fluorescent lamp, recessed	0	26	0.000	2,868	0	None	NO CHANGE	CFQ26/1		2	NO CHANGE	0	26	0.000	0	0.000	0	

Aloha Systems Measured Savings
09. Sheriff Field Operations Region II

		Existing Fixtures											New Fixtures							Savings							
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr					
48	Exterior	I100/1	Canopy	1	1 lamp 100W ceiling mount	3	100	0.300	4,380	1,314	None	Retrofit	CF26/1-SCRW		1	27W compact fluorescent spring lamp	3	27	0.081	355	0.219	959					
																	Total INCAN	7				0.388	1,444				
Total						245		35.180		107,499												Total	245	12.795	38,740	22.385	68,759

Sheriff Field Operations Region II – 3010 Victoria Blvd



Downstairs Bullpen Lighting Fixtures



Upstairs Bullpen Lighting Fixtures



Dr. Mark Shirilau, Inspecting a Lighting Fixture



Hallway 2x2 Fluorescent Fixtures

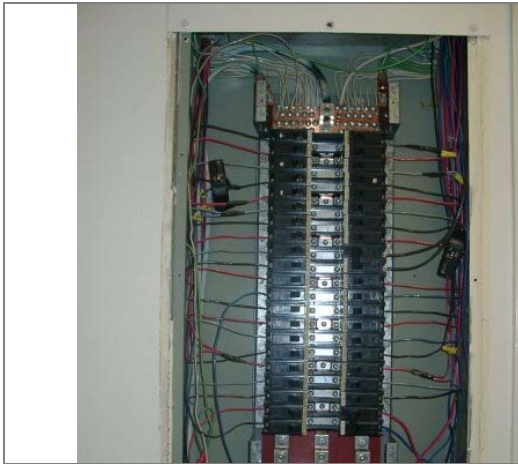


Rest Room 1x4 Fixture Ballast



Anti-Gang Unit Plaque

Sheriff Field Operations Region II – 3010 Victoria Blvd



Hallway Panel With Datalogger



Upstairs Lighting Contactor



Exercise / Storage Room Lights



Copy Room Light Fixture

Site Measurement and Verification Report

Site Number 10

ISD Monrovia Auto Shop and Warehouse

1703 Mountain Avenue, Monrovia

SCE Account 3-002-4370-24 and 3-002-4369-49

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	45,625 kWh
Contractor's As-Built Estimate	44,084 kWh
<i>Ex-Ante</i> Evaluation	56,692 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	39,086 kWh

Site Description

This location is a single story complex of offices, small warehouses, outdoor storage, and an auto repair facility with approximately six bays. County of Los Angeles vehicles from the area are regularly serviced and repaired at this facility. The office areas were mainly unoccupied at the time of the audit. Southern California Edison supplies the facility at 240 volts single phase through meter TP355-000771. Its annual energy consumption in 2002 was 108,102 kWh, and its peak demand was 33 kW. Consumption figures for the rest of 2003 were not available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The auto repair portion of the facility works Monday through Friday from 6:30 am to 4:00 pm. It is closed on Saturdays and Sundays. Workers of the auto shop told us that some of the offices in the complex have not been used for years.

Preliminary Site Visit

The site was visited on Thursday March 27, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. All 4-foot fluorescent fixtures observed had 34W energy-saver lamps. Inspection of a few fixtures yielded a ratio of 80% old "standard" magnetic ballasts and 20% newer energy-saving magnetic ballasts. The wattages of the existing fixtures were adjusted in our "metered" spreadsheet to account for this observation. These values were highlighted in magenta.

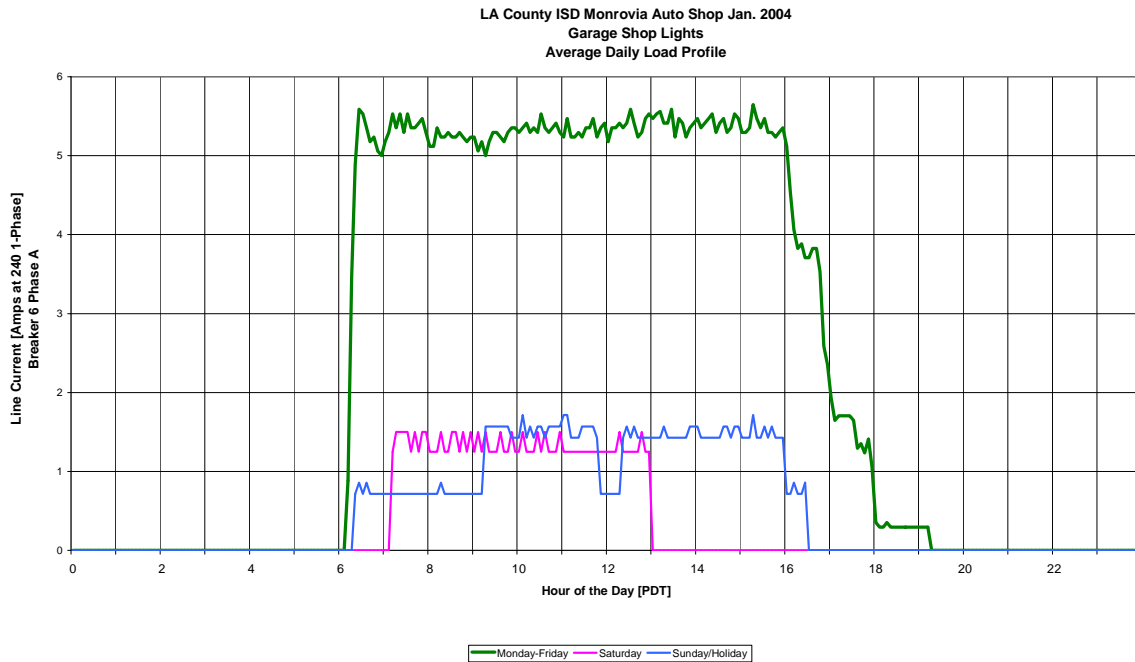
Post-Retrofit Audit

The site was again visited on December 29, 2003. We specifically re-verified the observations noted during the preliminary site visit. All the completed retrofits were verified and were correct.

Metered Load Profiles

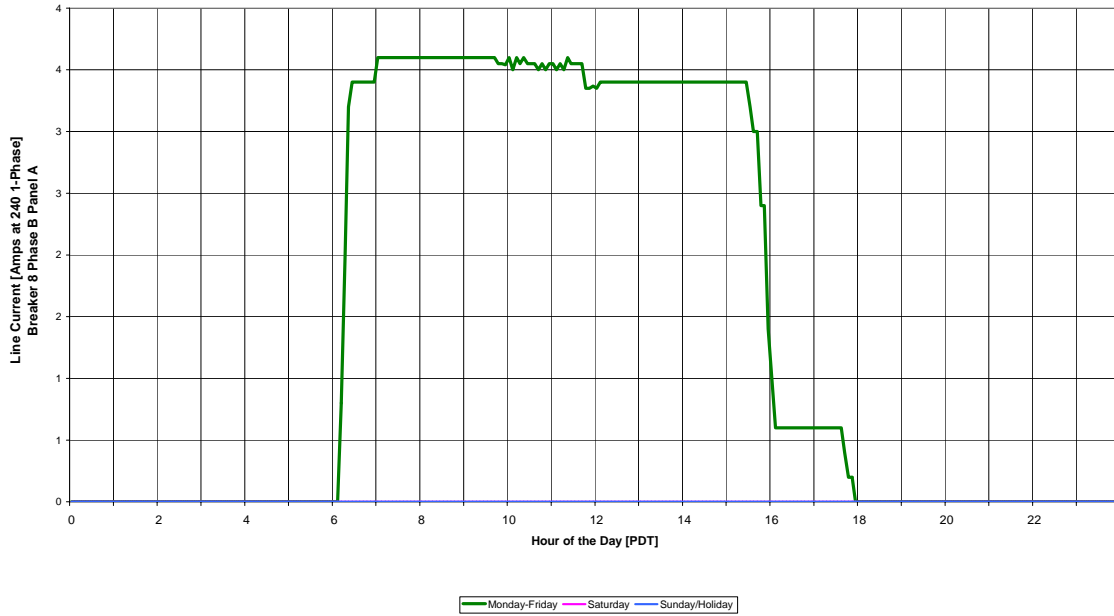
Dataloggers were installed to verify hours of operation at the facility. The areas that were monitored included the warehouse, carpenter shop, garage shop, and lube shop. The following load profiles depict the average daily operation of these areas.

Garage Shop: The load profile below represents the garage shop. The lights are on from about 6:00 a.m. to 7:00 p.m. during the week. The Saturday load is attributed to the lights being turned on one Saturday from 7:00 a.m. to 1:00 p.m. The Sunday and Holiday load is attributed to a light work day on the first of January and on Martin Luther King Day. The full load equivalent operating time is 2868 hours per year. The contractor used 2470 hours per year for this area.



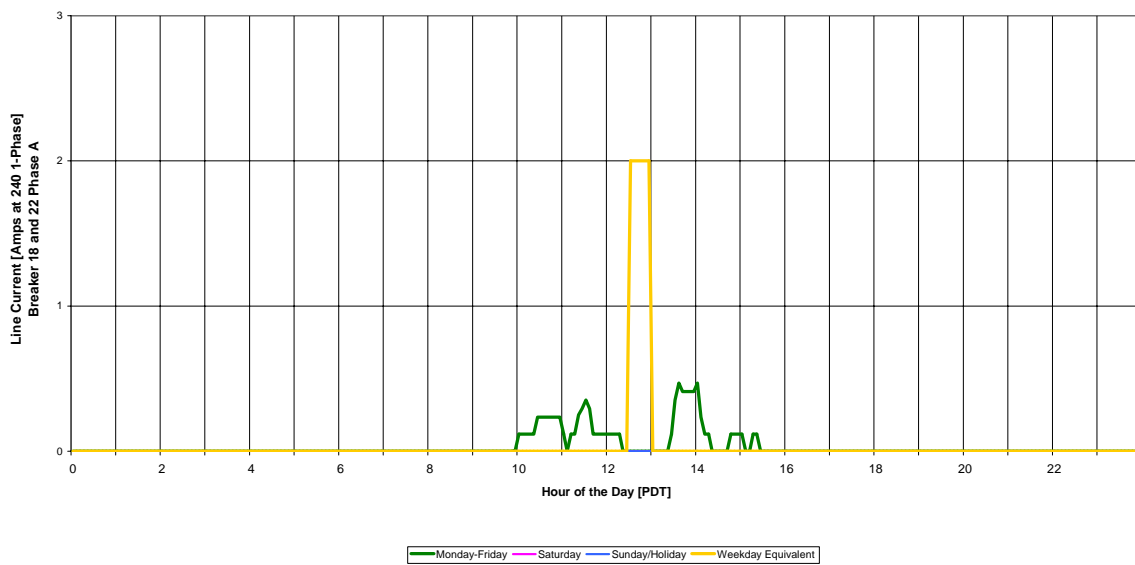
Lube Shop: The load profile below represents the lube shop. The lights are in use from 6:00 a.m. until 6:00 p.m. The full load equivalent operating time is 2412 hours per year.

LA County ISD Monrovia Auto Shop Jan. 2004
Lube Shop Lights
Average Daily Load Profile

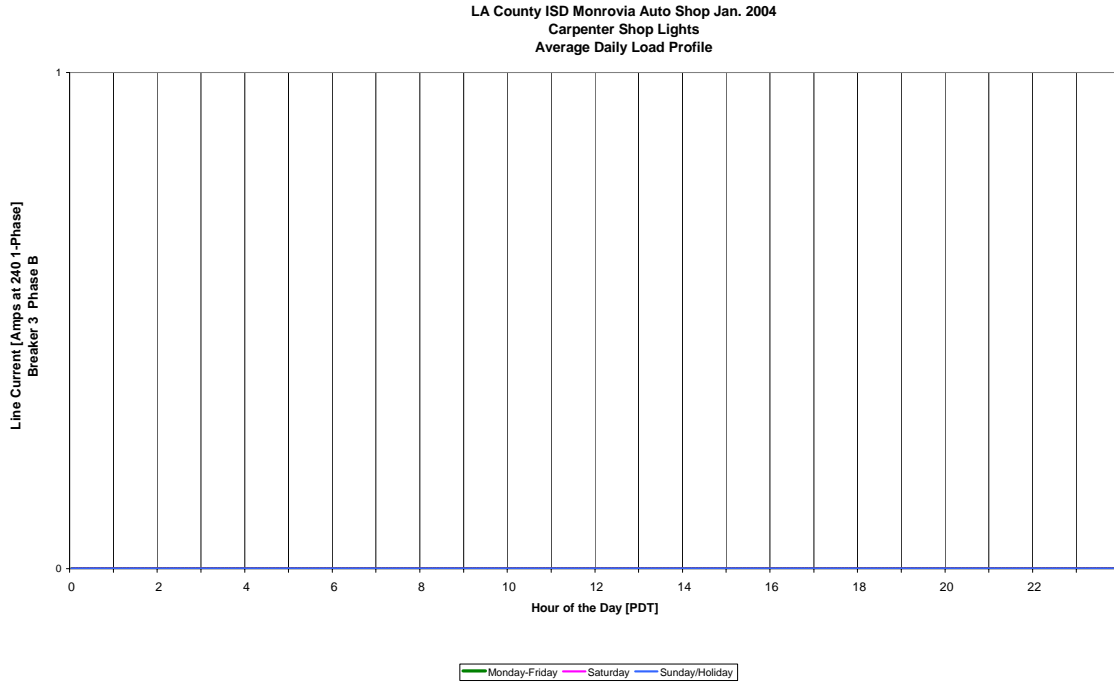


Warehouse: The load profile below represents the warehouse lights. This warehouse is not a very active area; consequently the graph shows a small load. The lights are on and off occasionally between 10:00 a.m. and 3:30 p.m. The full load (2-amp) equivalent operating time is 94 hours per year.

LA County ISD Monrovia Auto Shop Jan. 2004
Warehouse Lights
Average Daily Load Profile



Carpenter Shop: The load profile below represents the carpenter shop. Based upon discussions with staff and on-site observations, we expected low usage hours. The datalogger recorded no usage during the monitoring period.



The lube shop operating time (2412) was assigned to this area, listed as “small garage” on the spreadsheet. It was highlighted in blue because it essentially verified the contractor’s assumed 2470 h/yr value.

The main garage operating time (2868) was assigned to the main garage and its adjacent offices and equipment rooms. This value is slightly higher than the contractor’s 2470 h/yr value and was highlighted in tan.

The warehouse was locked and seldom used. Its 94 hour/year monitored operation is consistent with staff reports. This value was used only for this warehouse and was highlighted in tan. Likewise the carpenter shop, which was also gated, locked, and unused, actually recorded zero usage. The shop is gated but open to light from the outside and even if someone does go into it to retrieve something, it is not necessary (and also difficult) to turn on the lights. The zero value was used only for this area. It was highlighted in tan.

The locksmith office and the adjacent areas were occasionally, but not continuously used. They are locked and typically inaccessible to garage personnel. The contractor used a combination of 2470 and 520 h/yr estimates for these rooms. We consider 520 to be a reasonable estimate. The 2470 values were changed to 520 and highlighted in yellow.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

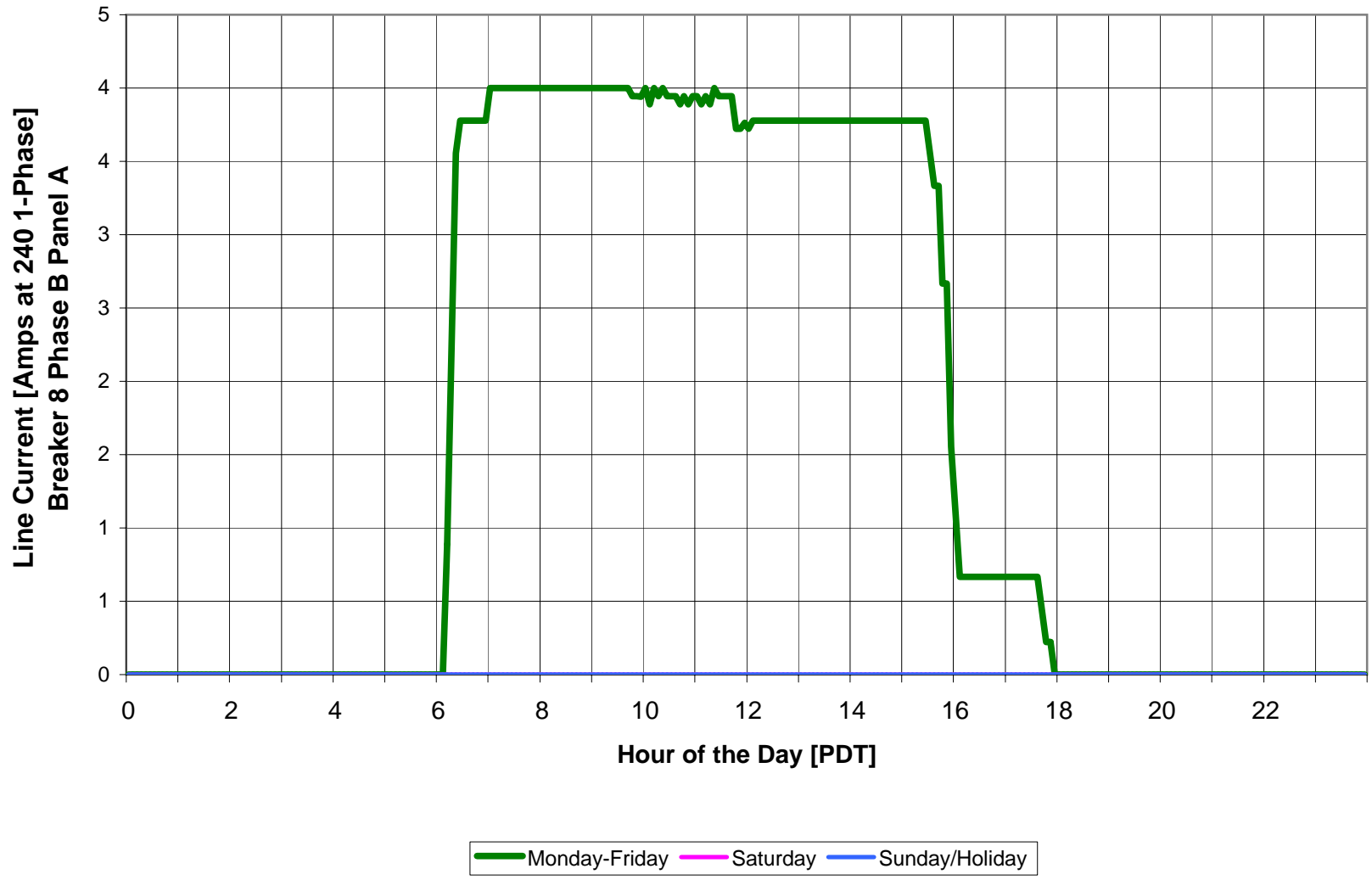
The following table delineates the savings at this site for each of the measure types included in the program.

ISD Monrovia Auto Shop and Warehouse Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	357	45,224	290	33,430	50,062	37,487
Inc to CFL	4	401	42	10,655	6,630	1,599
Total	361	45,625	332	44,084	56,692	39,086

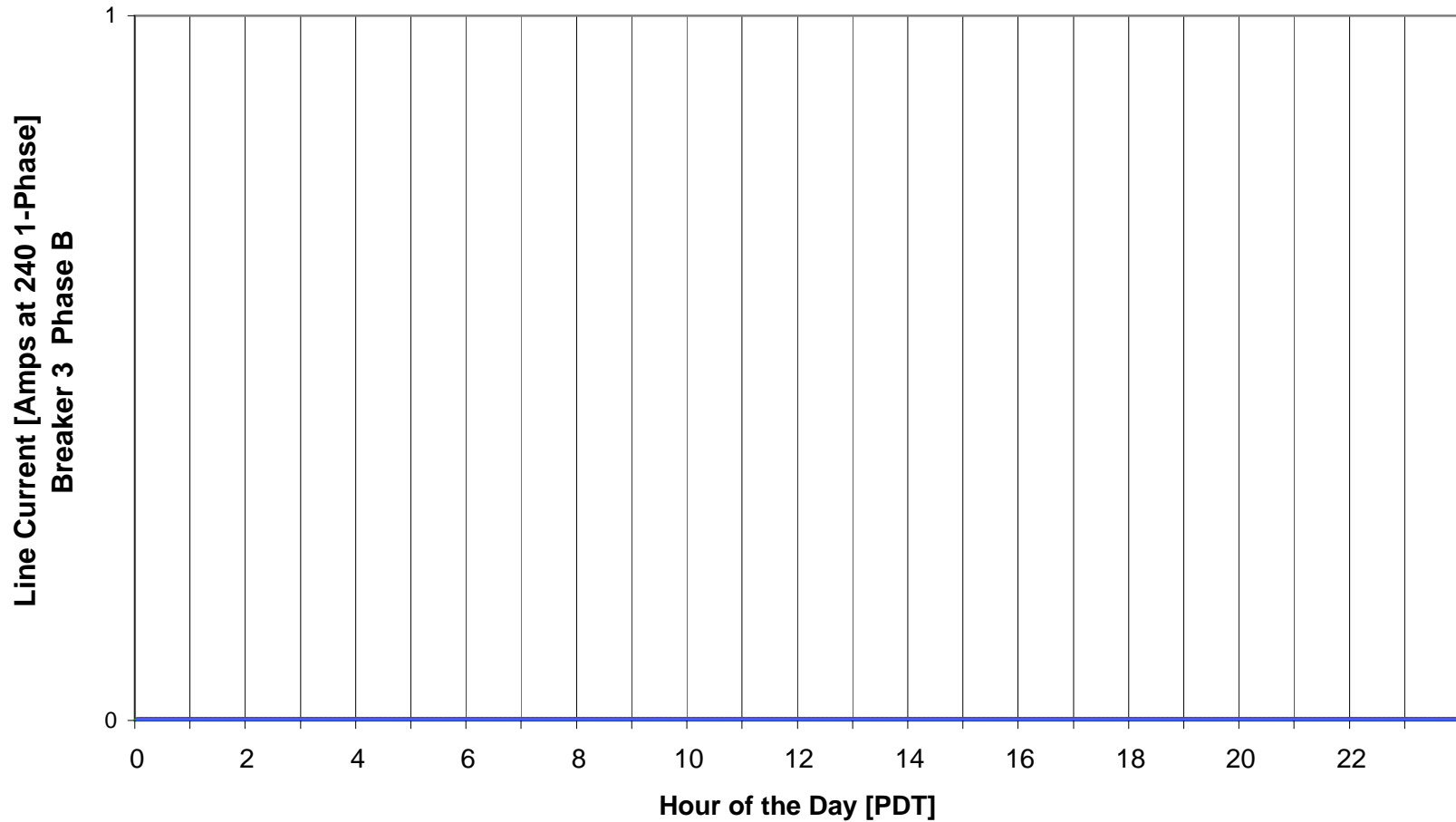
The *ex-ante* savings is higher than the other estimates because the average per-fixture savings at this site was less than the project-wide average. The *ex-post* measured savings estimate is slightly lower than the proposed or as-built savings because many of the areas had reduced operating hours. On the other hand, the main garage area had slightly higher than assumed operating hours and also had some existing standard bulbs and ballasts, which increased the project savings in these areas.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

LA County ISD Monrovia Auto Shop Jan. 2004
Lube Shop Lights
Average Daily Load Profile

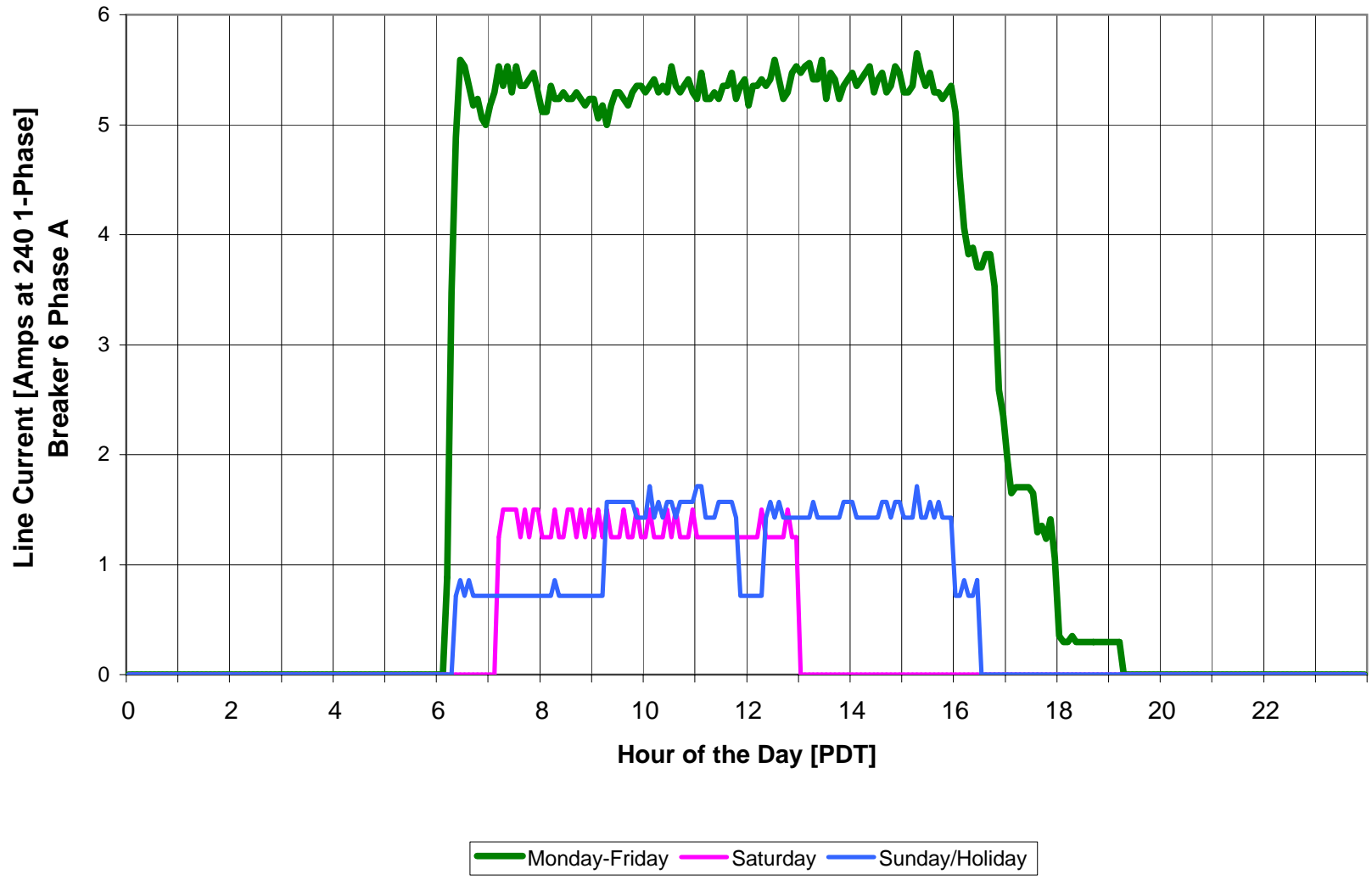


LA County ISD Monrovia Auto Shop Jan. 2004
Carpenter Shop Lights
Average Daily Load Profile

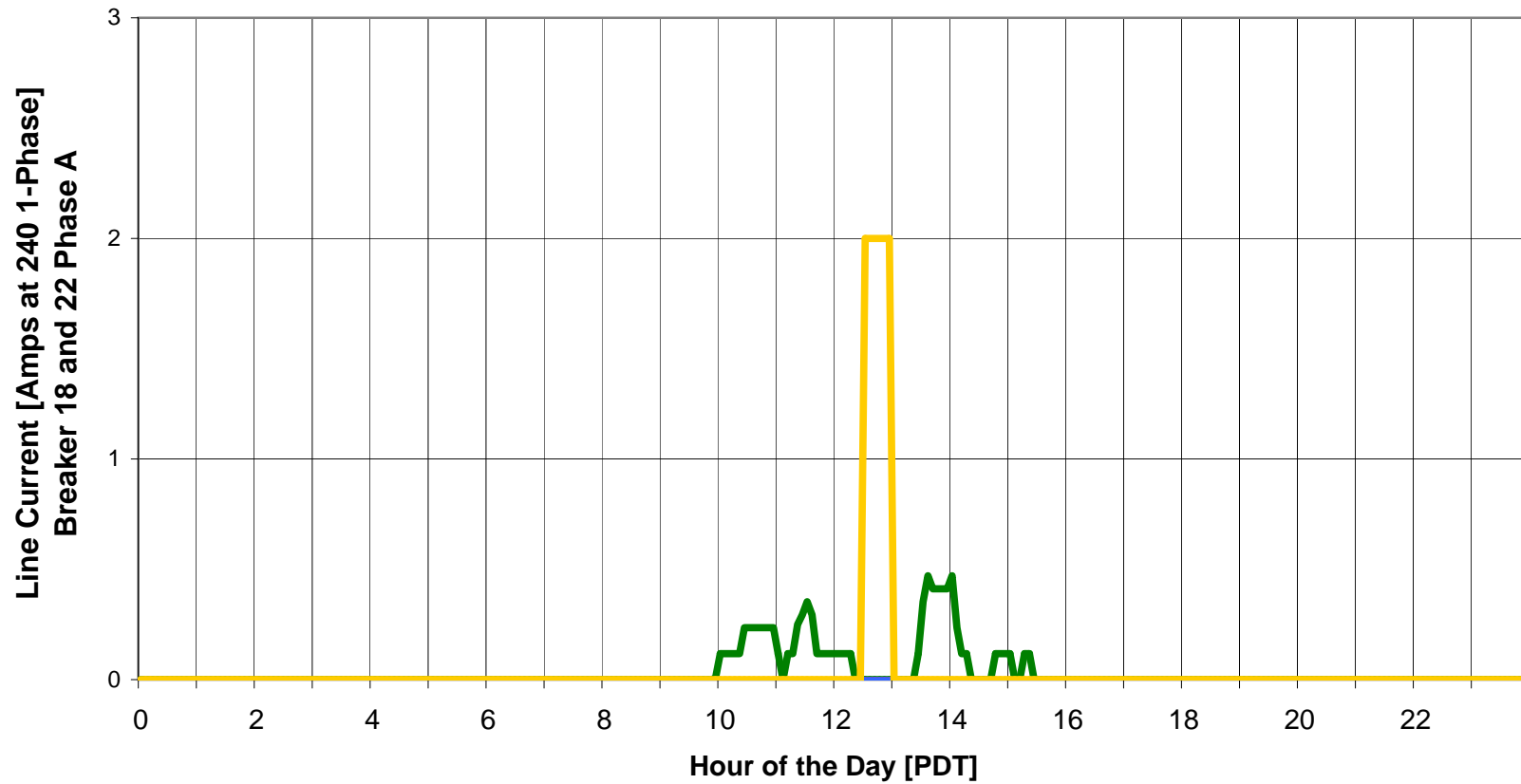


Monday-Friday Saturday Sunday/Holiday

LA County ISD Monrovia Auto Shop Jan. 2004
Garage Shop Lights
Average Daily Load Profile



LA County ISD Monrovia Auto Shop Jan. 2004
Warehouse Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday Weekday Equivalent

Contractor As-Built Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
49	PAINTBOOTH	MH100/1	Metal Hildie Bug Eyes	1	1lamp (100wmh)	0	128	0.00	520	0		NO CHANGE	MH100/1		1	Z	0	128	0.00	0	0.00	0	
50	EXTERIOR	MH100/1	Metal Hildie Bug Eyes	1	1lamp (100wmh)	0	128	0.00	4368	0		NO CHANGE	MH100/1		1	Z	0	128	0.00	0	0.00	0	
																Total HID	0				0.00	0	
2	LOCKSHOP	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	6	144	6/7	2470	2134		RETROFIT	F44ILL-R(G3)		4	LBO	6.0	88	0.528	1,304	0	830	
3	BACK RM	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	3	144	0.43	2470	1,067		RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.26	652	0.17	415	
4	UNM RM NXT TO LOCK SHOP	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	1	115	0.12	2470	284		RETROFIT	F43ILL-R(G3)		3	LBO	1	66	0.07	163	0.05	121	
5	CONT	F42EE	Troffer / Strip / Industrial Hood	2	1x4 2lamp (34wF40)	2	72	1/7	2470	355 2/3		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	222	0	133	
6	LOFT	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	1/7	520	74 7/8		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0	29	
7	UNDER LOFT	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	2	144	0.29	520	150		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	92	0.11	58	
8	BROWN DOUBLE DOOR	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	4	144	0.58	2470	1,423		RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.35	869	0.22	553	
9	MIRRORED WINDOWS RM	F42EE	Wrap	2	1x4 2lamp (34wF40)	10	72	0.72	2470	1,778		RETROFIT	F42ILL-R(G3)		2	LBO	10	45	0.45	1,112	0.27	667	
11	RR	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	217	0.06	138	

Contractor As-Built Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures											New Fixtures									Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
13	SHOWER	F44EE	Troffer	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	217	0.06	138	
14	SMALL OFFICE	F42EE	Wrap	2	1x4 2lamp (34wF40)	2	72	0.14	2470	356		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.09	222	0.05	133	
15	CARPENTER SHOP	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	20	144	2.88	2470	7,114		RETROFIT	F44ILL-R(G3)		4	LBO	20	88	1.76	4,347	1.12	2,766	
17	CONT	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	4	115	0.46	2470	1,136		RETROFIT	F43ILL-R(G3)		3	LBO	4	66	0.26	652	0.20	484	
18	CONT	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		REPLACE	F44ILL-R(G3)		4	New 144 Wrap T8	1	88	0.09	217	0.06	138	
19	CONT	F82EE	Strip	2	2 Lamp (60wF96)	1	123	0.12	2470	304		RETROFIT	F44ILL-R(G3)		2	Fitkit	1	88	0.09	217	0.04	86	
20	CONT	F42EE	Wrap	2	1x4 2lamp (34wF40)	3	72	0.22	2470	534		REPLACE	F42ILL-R(G3)		2	New Fixture 142 Wrap T8	3	45	0.14	333	0.08	200	
21	UNM CAGE STRG	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	10	144	1.44	520	749		RETROFIT	F44ILL-R(G3)		4	LBO	10	88	0.88	458	0.56	291	
22	CONT	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	2	115	0.23	520	120		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.13	69	0.10	51	
25	CONT	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	5	144	0.72	520	374		RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.44	229	0.28	146	
26	NXT CAGE	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	520	75		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	46	0.06	29	
27	NXT CAGE	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	3	144	0.43	520	225		RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.26	137	0.17	87	
29	CONT	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	2	144	0.29	520	150		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	92	0.11	58	

Contractor As-Built Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
30	HALL	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	1	115	0.12	2470	284		RETROFIT	F43ILL-R(G3)		3	LBO	1	66	0.07	163	0.05	121	
31	PICTURE WALL	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	4	144	0.58	2470	1,423		RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.35	869	0.22	553	
32	Warehouse	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	26	115	2.99	2470	7,385		RETROFIT	F43ILL-R(G3)		3	LBO	26	66	1.72	4,239	1.27	3,147	
34	WOMEN	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	217	0.06	138	
35	GARAGE AREA HALL ENTRY	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	217	0.06	138	
36	PARTS	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	8	115	0.92	2470	2,272		RETROFIT	F43ILL-R(G3)		3	LBO	8	66	0.53	1,304	0.39	968	
37	GARAGE	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	89	144	12.82	2470	31,656		RETROFIT	F44ILL-R(G3)		4	LBO	89	88	7.83	19,345	4.98	12,310	
38	SMALL GARAGE	F44EE	Surface Mounted	4	1x4 4lamp (34wF40)	18	144	2.59	2470	6,402		RETROFIT	F43ILL-R(G3)		4	Delamp to 3 Lamps	18	66	1.19	2,934	1.40	3,468	
39	SMALL GARAGE 2	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	27	144	3.89	2470	9,603		RETROFIT	F44ILL-R(G3)		4	LBO	27	88	2.38	5,869	1.51	3,735	
41	UNM STRG	F43EE	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	1	115	0.12	520	60		RETROFIT	F43ILL-R(G3)		3	LBO	1	66	0.07	34	0.05	25	
44	GARAGE OFFICE	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	217	0.06	138	
45	OFFICE	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	144	0.14	2470	356		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.09	217	0.06	138	
46	PARTS STRG	F82EE	Strip	2	2 Lamp (60wF96)	1	123	0.12	520	64		RETROFIT	F44ILL-R(G3)		2	Fitkit	1	88	0.09	46	0.04	18	

Contractor As-Built Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
47	MIRRORED WINDOW RM	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	2	144	0.29	2470	711		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.18	435	0.11	277	
48	LRG BAY DRS	F44EE	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	24	144	3.46	520	1,797		RETROFIT	F44ILL-R(G3)		4	LBO	24	88	2.11	1,098	1.34	699	
																Total T12-T8	290				15.80	33,430	
10	MEN ENTRY	I100/1	Keyless	1	100w 1lamp	1	100	0.10	2470	247		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.03	82	0.07	165	
12	CONT	I100/1	Keyless	1	100w 1lamp	1	100	0.10	2470	247		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	1	45	0.05	111	0.06	136	
16	NXT BROWN DR DOWN	I100/1	Keyless	1	100w 1lamp	6	100	0.60	2470	1,482		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	6	45	0.27	667	0.33	815	
23	CONT	I100/1	Keyless	1	100w 1lamp	3	100	0.30	520	156		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	3	45	0.14	70	0.17	86	
24	NXT CAGE STRG	I100/1	Keyless	1	100w 1lamp	3	100	0.30	520	156		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	3	45	0.14	70	0.17	86	
28	NXT CAGE	I100/1	Keyless	1	100w 1lamp	3	100	0.30	520	156		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	3	45	0.14	70	0.17	86	
33	Warehouse	I200/1	Keyless	1	100w 1lamp	21	200	4.20	2470	10,374		REPLACE	F22ILL-R		1	New 2' 2L T8 OS	21	29	0.60	1,494	3.60	8,880	
40	COMPRESSOR RM	I100/1	Keyless	1	100w 1lamp	1	100	0.10	520	52		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.03	17	0.07	35	
42	CONT	I100/1	Keyless	1	100w 1lamp	1	100	0.10	520	52		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.03	17	0.07	35	

Contractor As-Built Savings
 10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
43	MENS RR	I100/1	Keyless	1	100w 1lamp	2	100	0.20	2470	494		RETROFIT	CFQ26/1		1	TCP CFSI	2	33	0.07	163	0.13	331
																Total INCAN	42				4.810	10,655
Total						332		45.55		95,965						Total	332		24.937	51,881	20.61	44,084

Aloha Systems Measured Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
49	PAINTBOOTH	MH100/1	Metal Hilde Bug Eyes	1	1lamp (100wmh)	0	128	0.000	520	0		NO CHANGE	MH100/1		1	Z	0	128	0.000	0	0.00	0	
50	EXTERIOR	MH100/1	Metal Hilde Bug Eyes	1	1lamp (100wmh)	0	128	0.000	4368	0		NO CHANGE	MH100/1		1	Z	0	128	0.000	0	0.00	0	
																Total HID	0				0.00	0	
2	LOCKSHOP	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	6	160	0.960	520	499		RETROFIT	F44ILL-R(G3)		4	LBO	6.0	88	0.528	275	0	225	
3	BACK RM	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	3	160	0.480	520	250		RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	137	0.22	112	
4	UNM RM NXT TO LOCK SHOP	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	1	129	0.129	520	67		RETROFIT	F43ILL-R(G3)		3	LBO	1	66	0.066	34	0.06	33	
5	CONT	F42EE- F42ES	Troffer / Strip / Industrial Hood	2	1x4 2lamp (34wF40)	2	80	0.160	520	83		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0	36	
6	LOFT	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	520	83		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0	37	
7	UNDER LOFT	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	2	160	0.320	520	166		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	92	0.14	75	
8	BROWN DOUBLE DOOR	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	4	160	0.640	520	333		RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	183	0.29	150	
9	MIRRORED WINDOWS RM	F42EE- F42ES	Wrap	2	1x4 2lamp (34wF40)	10	80	0.800	520	416		RETROFIT	F42ILL-R(G3)		2	LBO	10	45	0.450	234	0.35	182	
11	RR	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	520	83		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0.07	37	

Aloha Systems Measured Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
13	SHOWER	F44EE- F44ES	Troffer	4	1x4 4lamp (34wF40)	1	160	0.160	520	83		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0.07	37	
14	SMALL OFFICE	F42EE- F42ES	Wrap	2	1x4 2lamp (34wF40)	2	80	0.160	520	83		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.07	36	
15	CARPENTER SHOP	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	20	160	3.200	0	0		RETROFIT	F44ILL-R(G3)		4	LBO	20	88	1.760	0	1.44	0	
17	CONT	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	4	129	0.518	520	269		RETROFIT	F43ILL-R(G3)		3	LBO	4	66	0.264	137	0.25	132	
18	CONT	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	520	83		REPLACE	F44ILL-R(G3)		4	New 144 Wrap T8	1	88	0.088	46	0.07	37	
19	CONT	F82EE- F82ES	Strip	2	2 Lamp (60wF96)	1	127	0.127	520	66		RETROFIT	F44ILL-R(G3)		2	Fitkit	1	88	0.088	46	0.04	20	
20	CONT	F42EE- F42ES	Wrap	2	1x4 2lamp (34wF40)	3	80	0.240	520	125		REPLACE	F42ILL-R(G3)		2	New Fixture 142 Wrap T8	3	45	0.135	70	0.11	55	
21	UNM CAGE STRG	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	10	160	1.600	520	832		RETROFIT	F44ILL-R(G3)		4	LBO	10	88	0.880	458	0.72	374	
22	CONT	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	2	129	0.259	520	135		RETROFIT	F43ILL-R(G3)		3	LBO	2	66	0.132	69	0.13	66	
25	CONT	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	5	160	0.800	520	416		RETROFIT	F44ILL-R(G3)		4	LBO	5	88	0.440	229	0.36	187	
26	NXT CAGE	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	520	83		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0.07	37	
27	NXT CAGE	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	3	160	0.480	520	250		RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	137	0.22	112	
29	CONT	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	2	160	0.320	520	166		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	92	0.14	75	

Aloha Systems Measured Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
30	HALL	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	1	129	0.129	520	67		RETROFIT	F43ILL-R(G3)		3	LBO	1	66	0.066	34	0.06	33	
31	PICTURE WALL	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	4	160	0.640	520	333		RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	183	0.29	150	
32	Warehouse	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	26	129	3.364	94	316		RETROFIT	F43ILL-R(G3)		3	LBO	26	66	1.716	161	1.65	155	
34	WOMEN	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	2868	459		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	252	0.07	206	
35	GARAGE AREA HALL ENTRY	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	2868	459		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	252	0.07	206	
36	PARTS	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	8	129	1.035	2868	2,969		RETROFIT	F43ILL-R(G3)		3	LBO	8	66	0.528	1,514	0.51	1,455	
37	GARAGE	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	89	160	14.240	2868	40,840		RETROFIT	F44ILL-R(G3)		4	LBO	89	88	7.832	22,462	6.41	18,378	
38	SMALL GARAGE	F44EE- F44ES	Surface Mounted	4	1x4 4lamp (34wF40)	18	160	2.880	2412	6,947		RETROFIT	F43ILL-R(G3)		4	Delamp to 3 Lamps	18	66	1.188	2,865	1.69	4,081	
39	SMALL GARAGE 2	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	27	160	4.320	2412	10,420		RETROFIT	F44ILL-R(G3)		4	LBO	27	88	2.376	5,731	1.94	4,689	
41	UNM STRG	F43EE- F43ES	Industrial Hood / Pendant	3	1x4 3lamp (34wF40)	1	129	0.129	2868	371		RETROFIT	F43ILL-R(G3)		3	LBO	1	66	0.066	189	0.06	182	
44	GARAGE OFFICE	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	2868	459		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	252	0.07	206	
45	OFFICE	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	1	160	0.160	2868	459		RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	252	0.07	206	
46	PARTS STRG	F82EE- F82ES	Strip	2	2 Lamp (60wF96)	1	127	0.127	2868	364		RETROFIT	F44ILL-R(G3)		2	Fitkit	1	88	0.088	252	0.04	112	

Aloha Systems Measured Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
47	MIRRORED WINDOW RM	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	2	160	0.320	2868	918		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	505	0.14	413	
48	LRG BAY DRS	F44EE- F44ES	Pendant Mounted / Wrap / Strip / Industrial Hood	4	1x4 4lamp (34wF40)	24	160	3.840	2868	11,013		RETROFIT	F44ILL-R(G3)		4	LBO	24	88	2.112	6,057	1.73	4,956	
																Total T12-T8	290				20.21	37,487	
10	MEN ENTRY	I100/1	Keyless	1	100w 1lamp	1	100	0.100	520	52		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	17	0.07	35	
12	CONT	I100/1	Keyless	1	100w 1lamp	1	100	0.100	520	52		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	1	45	0.045	23	0.06	29	
16	NXT BROWN DR DOWN	I100/1	Keyless	1	100w 1lamp	6	100	0.600	520	312		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	6	45	0.270	140	0.33	172	
23	CONT	I100/1	Keyless	1	100w 1lamp	3	100	0.300	520	156		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	3	45	0.135	70	0.17	86	
24	NXT CAGE STRG	I100/1	Keyless	1	100w 1lamp	3	100	0.300	520	156		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	3	45	0.135	70	0.17	86	
28	NXT CAGE	I100/1	Keyless	1	100w 1lamp	3	100	0.300	520	156		REPLACE	F42ILL-R(G3)		1	New OS 142 T8	3	45	0.135	70	0.17	86	
33	Warehouse	I200/1	Keyless	1	100w 1lamp	21	200	4.200	94	395		REPLACE	F22ILL-R		1	New 2' 2L T8 OS	21	29	0.605	57	3.60	338	
40	COMPRESSOR RM	I100/1	Keyless	1	100w 1lamp	1	100	0.100	2868	287		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	95	0.07	192	
42	CONT	I100/1	Keyless	1	100w 1lamp	1	100	0.100	2868	287		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	95	0.07	192	

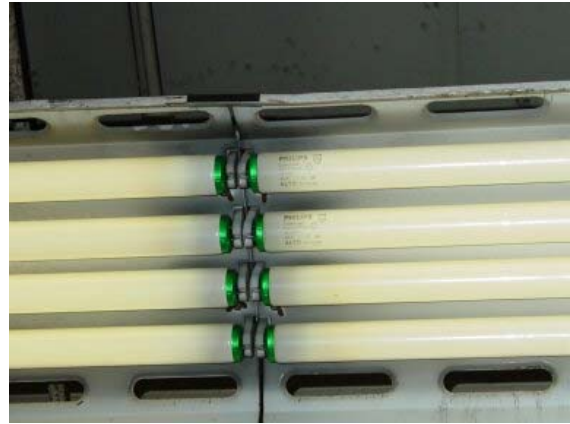
Aloha Systems Measured Savings
10. ISD Monrovia Auto Shop and Warehouse

		Existing Fixtures										New Fixtures								Savings				
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
43	MENS RR	I100/1	Keyless	1	100w 1lamp	2	100	0.200	2868	574		RETROFIT	CFQ26/1		1	TCP CFSI	2	33	0.066	189	0.13	384		
																Total INCAN	42				4.810	1,599		
Total						332		49.958		83.392			Total						332		24.937	44.306	25.02	39,086

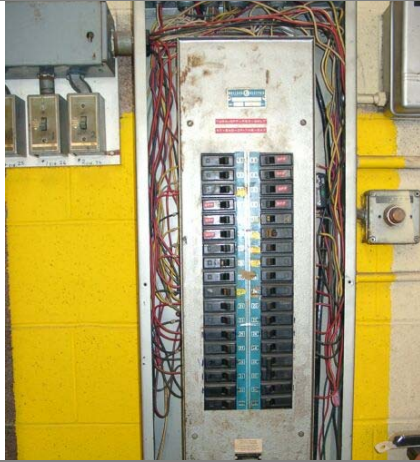
ISD Monrovia Auto Shop – 1703 S. Mountain Avenue



Auto Shop Lighting 4-lamp Old Light Fixtures



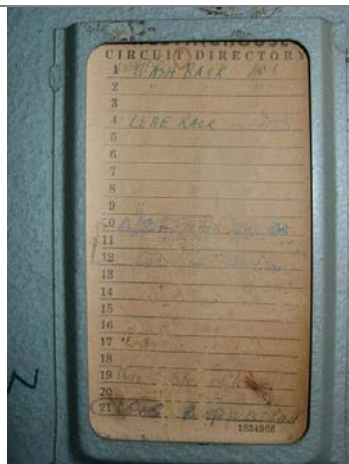
Auto Shop Old Light Fixtures And Lamps



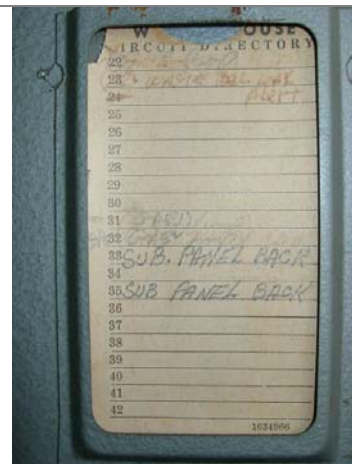
Auto Shop Main Breaker Panel



Warehouse Main Breaker Panel A



Warehouse Main Panel A Legend (Top)



Warehouse Main Panel A Legend (Bottom)

ISD Monrovia Auto Shop – 1703 S. Mountain Avenue



Warehouse 4-lamp Fluorescent Light Fixtures



Warehouse 2-foot Fluorescent Light Fixtures



Warehouse Lighting Breaker Panel



Warehouse Light Fixtures



**Warehouse Light Switch Located Behind Pallets
On Wall That Cannot Be Operated**



Carpenter Shop Light Fixtures

ISD Monrovia Auto Shop – 1703 S. Mountain Avenue



Carpenter Shop Breaker Panel with Datalogger

PANELBOARD		V.	PH.	DATE	PANELBOARD		V.	PH.	DATE
FED FROM PANEL	CIR.	LOAD DESCRIPTION			FED FROM PANEL	CIR.	LOAD DESCRIPTION		
1		DRINKING FOUNTAIN			22		B/C		
2		LIGHTS TO END CONVEYOR			23		DRILL PRESS		
3		NORTH SPARE BREAKER			24		TABLE SAW		
4		SOUTH SPARE BREAKER			25		TABLE SAW		
5		LIGHTS UNDER MAIN DOOR			26		TABLE SAW		
6		220 OUTLET 100' SW			27		BAND SAW		
7		110 OUTLET 100' SW			28		CUT OFF SAW		
8		110 OUTLET 100' SW			29		BAND SAW		
9		110 OUTLET 100' SW			30		CUT OFF SAW		
10		120 OUTLET 100' SW			31				
11		20 OUTLET 100' SW			32				
12		COLD ROOM LIGHTS			33				
13		CAMPUS 4 110V/200V/240V			34				
14		CAMPUS 4 110V/200V/240V			35				
15		HEATER			36				
16		HEATER			37				
17		DRINKING FOUNTAIN			38				
18		BAND SAW			39				
19		B/C			40				
20		B/C			41				
21		BAND SAW			42				

Carpenter Shop Panel Legend

Site Measurement and Verification Report

Site Number 11

Sheriff Central Communications Center

1277 N. Eastern Avenue, Los Angeles

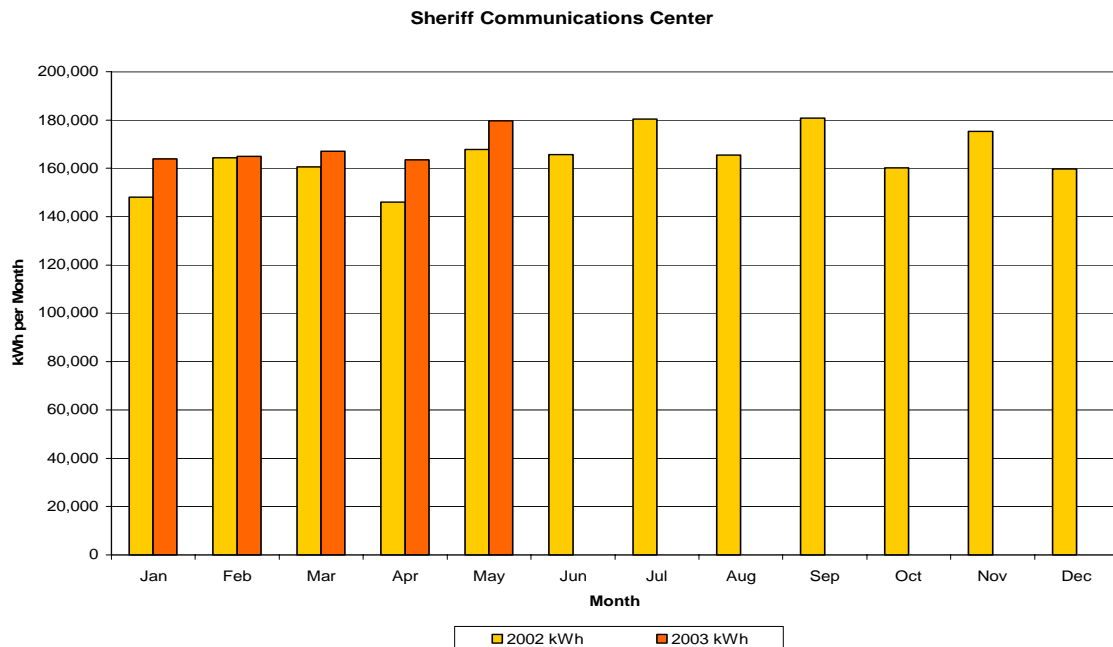
SCE Account 3-003-5328-45

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	235,718 kWh
Contractor's As-Built Estimate	208,765 kWh
Ex-Ante Evaluation	133,636 kWh
Aloha Ex-Post Measured Evaluation	169,584 kWh

Site Description

The Sheriff's Central Communications Center is a single main building with a garage and trailers on the facility as well. It is 53,813 square feet. It is located on top of a hill on the west side of Eastern Avenue. Southern California Edison supplies the facility at 480Y/277 volts through meter V349E-006600. Its annual energy consumption in 2002 was 1,974,608 kWh, and its peak demand was 319 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The facility includes communications operators who are on duty 24 hours per day, 365 days per year. Generators to enable continuous operation during a utility outage back up the power system. In addition to the 24/7 operations, there are also offices, classrooms, and workshops operating during normal business hours only.



Spreadsheet Errors

The spreadsheets were presented to us with direct values rather than formulas. Upon conversion to formulas, occasionally the rows did not multiply correctly and occasionally the rows did not add exactly to the reported total. Often this was the case when “no change” was reported because of the use of zero quantities. We corrected these problems by setting both the “existing” and “new” quantities to zero for any line item in which there were not fixtures changes. This will allow both the fixture and kWh sums to accurately represent the project. The purpose of the lighting spreadsheets is not to document every light in the facility, but rather to document only those that were retrofitted.

Changes made as a result of correcting the contractor’s spreadsheet errors are highlighted in lavender on Aloha’s “metered” spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor’s as-built spreadsheet.

Preliminary Site Visit

The site was visited on February 20, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

Two discrepancies were discovered. The spreadsheet did not include the thirty recessed ceiling lights in the center of the main lobby. The spreadsheet listed the exterior and interior recessed entryway lights as incandescent when in fact compact fluorescents were already installed.

These discrepancies were pointed out to LA County staff. The as-built spreadsheets from the installation contractor corrected for the existing lower “tread light” compact fluorescents, but not the ceiling fixtures. The recessed lobby ceiling lights were still not included on the as-built spreadsheet we were given.

Post-Retrofit Audit

The site was again visited on June 25, 2003. We specifically re-verified the observations noted during the preliminary site visit. The recessed lobby ceiling lights had indeed been retrofitted, and the sheriff’s staff working in the area indicated that the contractors had worked on those lights. The recessed ceiling fixtures were added as a line item and the spreadsheet was changed to note the existing lobby CFLs. These spreadsheet changes were highlighted in pink.

Additional discrepancies were also noted. Two fixtures in the MDCS Programming office had been de-lamped because the new lights were too bright. The kitchen lights, listed as new four-lamp fixtures, were in fact only two-lamp fixtures. These changes were also highlighted in pink and raised the energy savings estimate. The two-lamp fixtures in the maintenance shop and offices were replaced because they did

not provide sufficient light. The as-built spreadsheet made the wattage changes correctly and simply did not change the “lamps per fixture” quantity. This change was highlighted in lavender and did not affect the savings estimate.

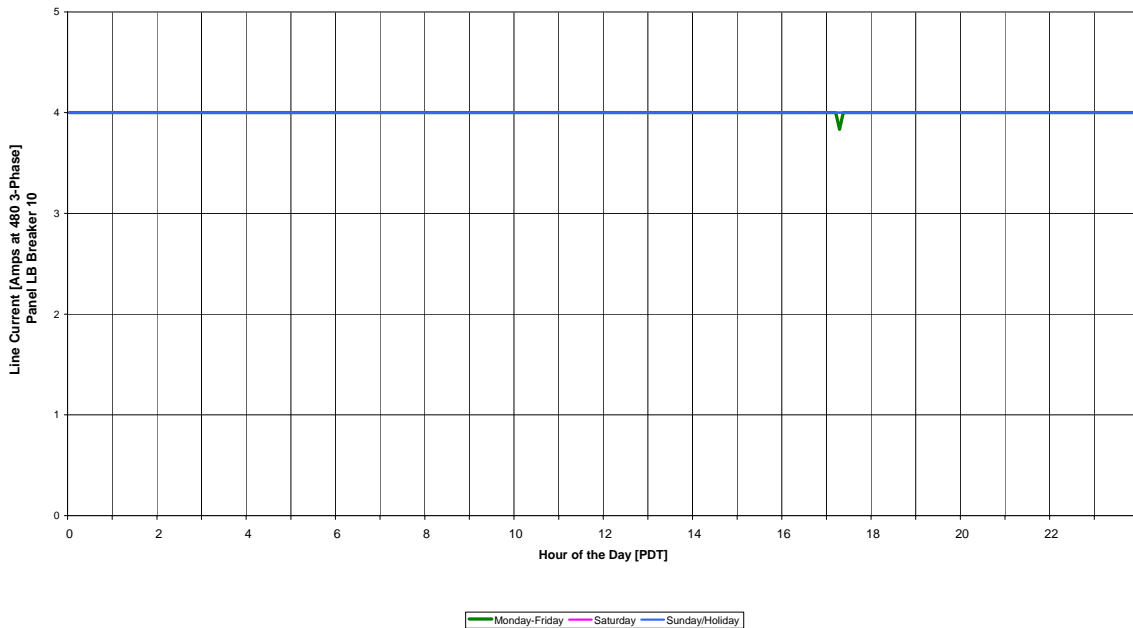
Metered Load Profiles

Although the facility is occupied and operational on a continuous basis, many areas are not in fact used throughout the night and weekends. We collected interval data for lighting loads in six locations. We selected loads that were either variable or were not certain to operate 24 hours per day. Those areas where continuous operation was indicated by local staff were assumed to operate in that manner due to the nature of the facility. The six lighting areas on which we collected data were:

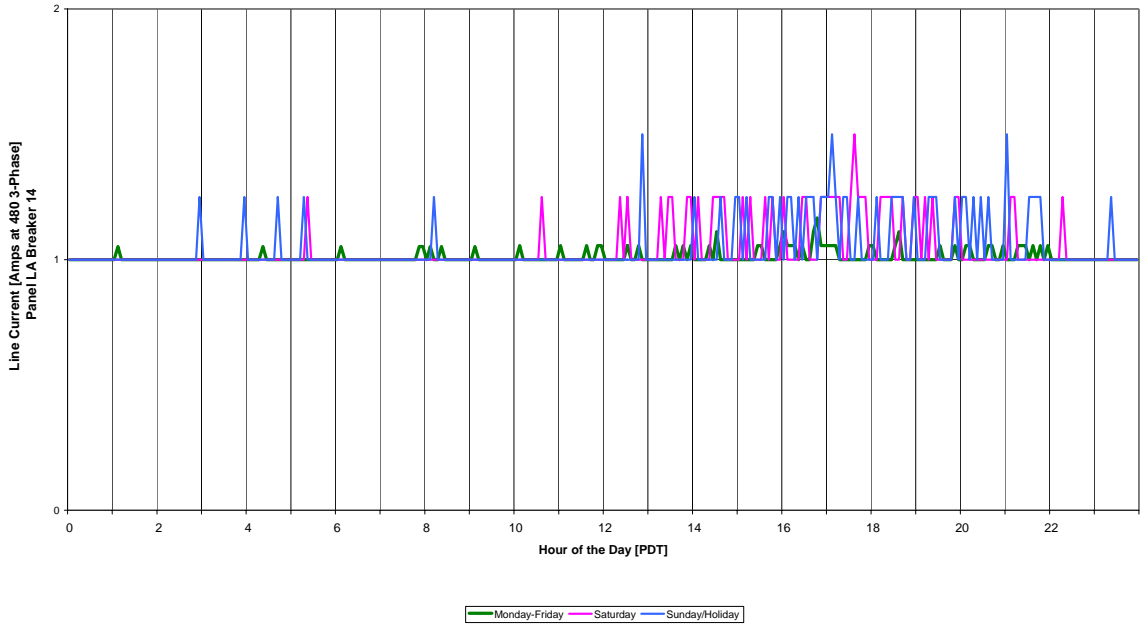
- Restroom/locker rooms
- Transmitter Room 109 behind Dispatch
- Offices of Room 133
- Computer Room 158
- Radio Equipment Room 130
- Trailer A Offices

Restrooms, Transmitter Room, Offices, and Computer Rooms: The restrooms, transmitter room, and Room 133 offices demonstrated continuous operation seven days per week. The computer room showed one Sunday morning of reduced operation, resulting in an effective full-load operating time of 8,725 hours per year.

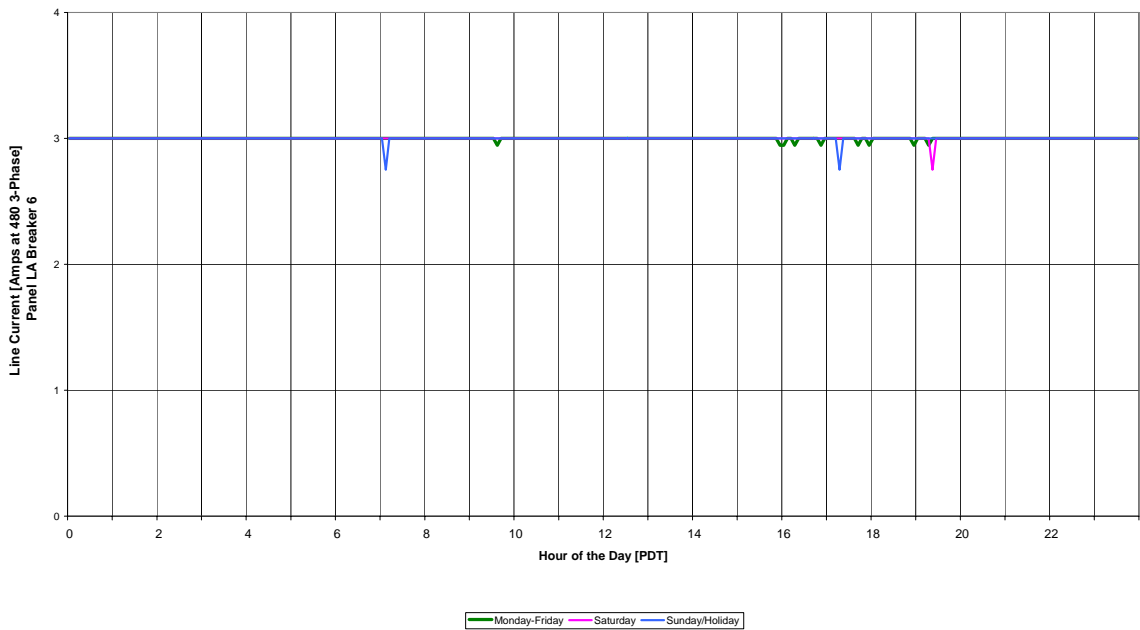
LA County Sheriff Communications Center June/July 2003
 Womens Restroom- Locker Room Lights
 Average Daily Load Profile



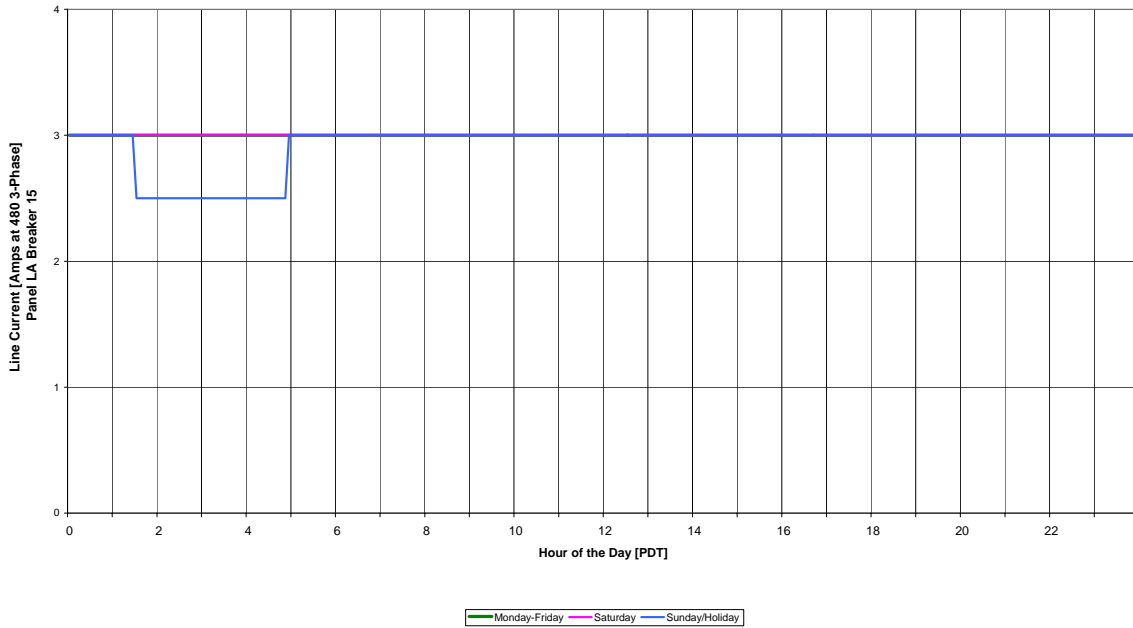
LA County Sheriff Communications Center June/July 2003
 Transmitter Room 109 Lights
 Average Daily Load Profile



LA County Sheriff Communications Center June/July 2003
 Offices 133 Lights
 Average Daily Load Profile

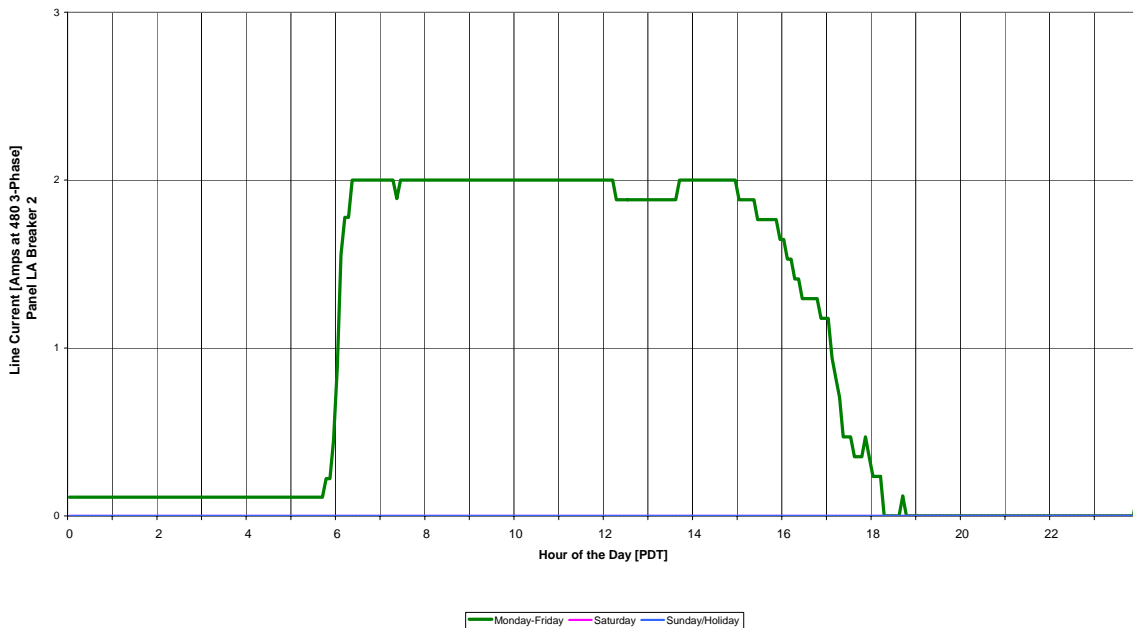


LA County Sheriff Communications Center June/July 2003
 Computer Room #158 Lights
 Average Daily Load Profile

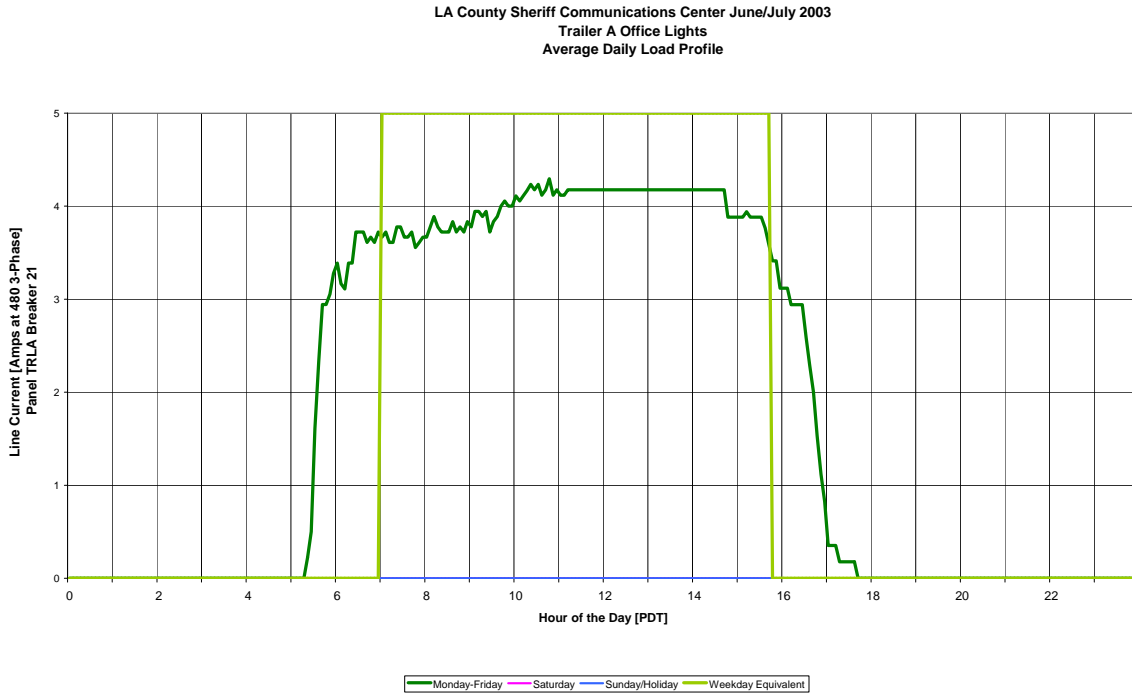


Radio Equipment Room: The radio equipment room demonstrated weekday operation from about 6:00 a.m. until about 5:00 p.m., which is consistent with the operating schedule reported by staff. This results in an equivalent full-load operating time of 2,785 hours per year.

LA County Sheriff Communication Center June/July 2003
 Radio Equipment Room 130 Lights
 Average Daily Load Profile



Trailer A: The office lights in Trailer A operated on weekdays from about 5:30 a.m. until about 4:30 p.m. They did not always operate at full load (which was recorded as 5A by the datalogger) because individual switch controls are available for different sections of the trailer. The resultant equivalent full-load operating time is 2,174 hours per year. The contractor as-built spreadsheet full load equivalent operating time is 8760 hours per year.



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the

stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

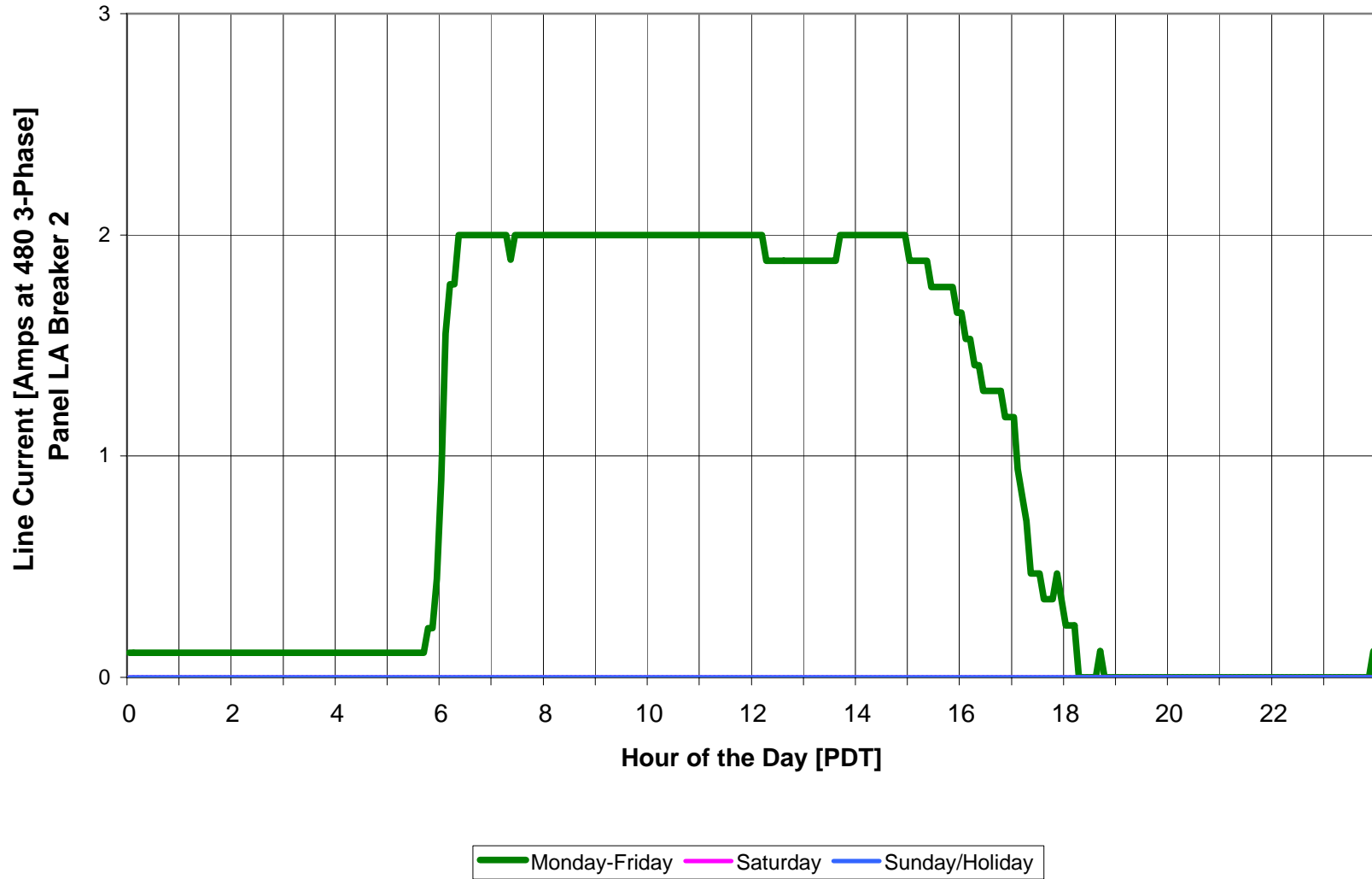
The following table delineates the savings at this site for each of the measure types included in the program.

Sheriff Central Communications Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit			0		0	
Exit Lights	30	12615	25	10,512	9,022	10,512
T12 to T8	700	214841	699	189,635	120,668	156,849
Inc to CFL	24	8262	25	8,618	3,964	2,224
Total	754	235,718	749	208,765	133,636	169,584

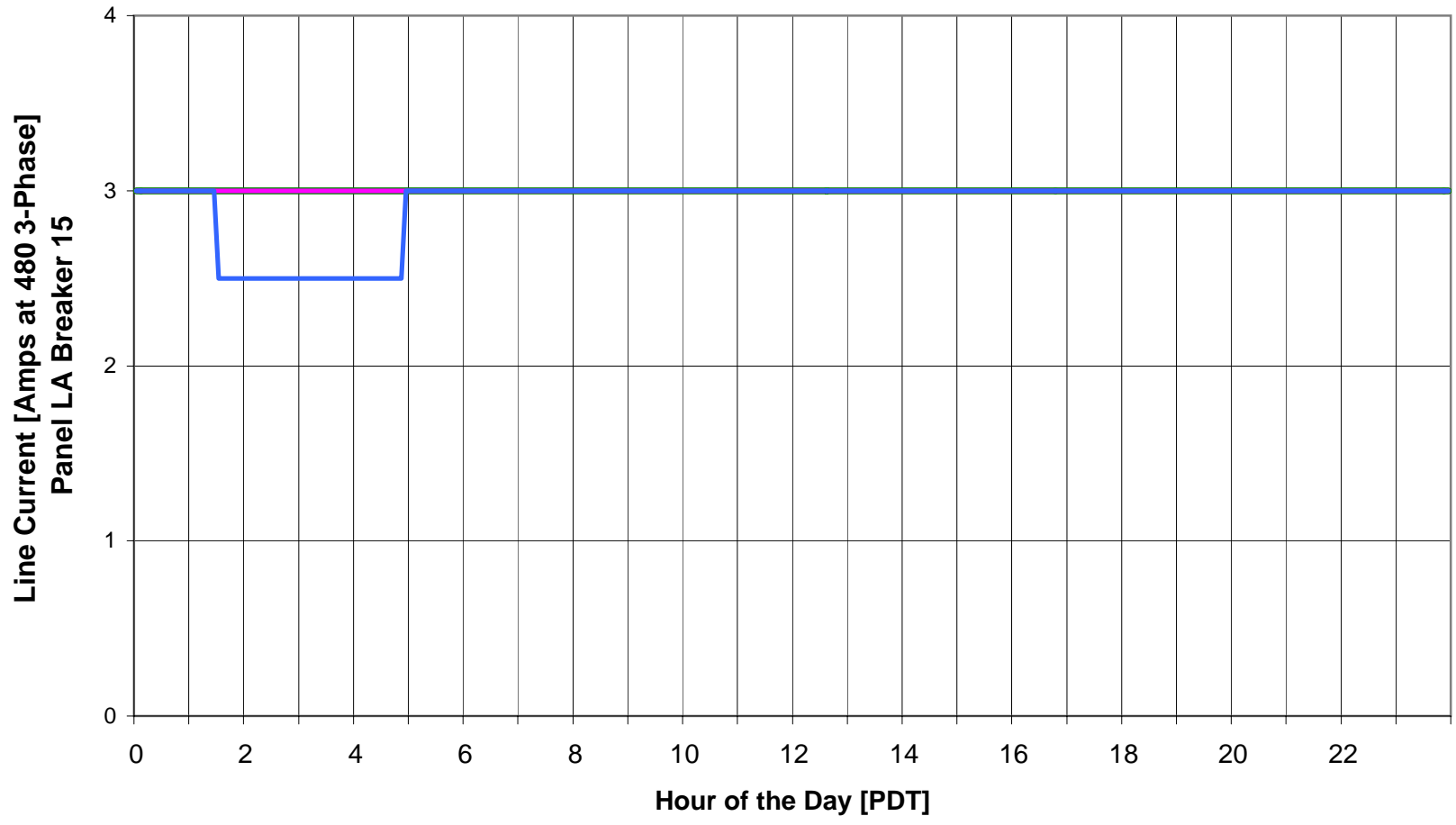
The contractor’s savings estimate is higher than both the *ex-ante* and *ex-post* savings primarily because a larger portion of this site was assumed to operate on a continuous basis than in fact it does. There are several offices and other areas that are not directly connected with the dispatch operators that operate during more standard business hours. The lower actual operating times are the reason why the *ex-post* estimate is lower than the contractor’s as-built. The *ex-ante* estimate is between the two because the generic operating hours numbers used in the CPUC spreadsheet for all building sites do not account for the long operating hours in many portions of this site, but the generic wattage reduction numbers assume a more aggressive lighting replacement strategy than was achievable in many laboratories and work areas at this site.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

LA County Sheriff Communication Center June/July 2003
Radio Equipment Room 130 Lights
Average Daily Load Profile

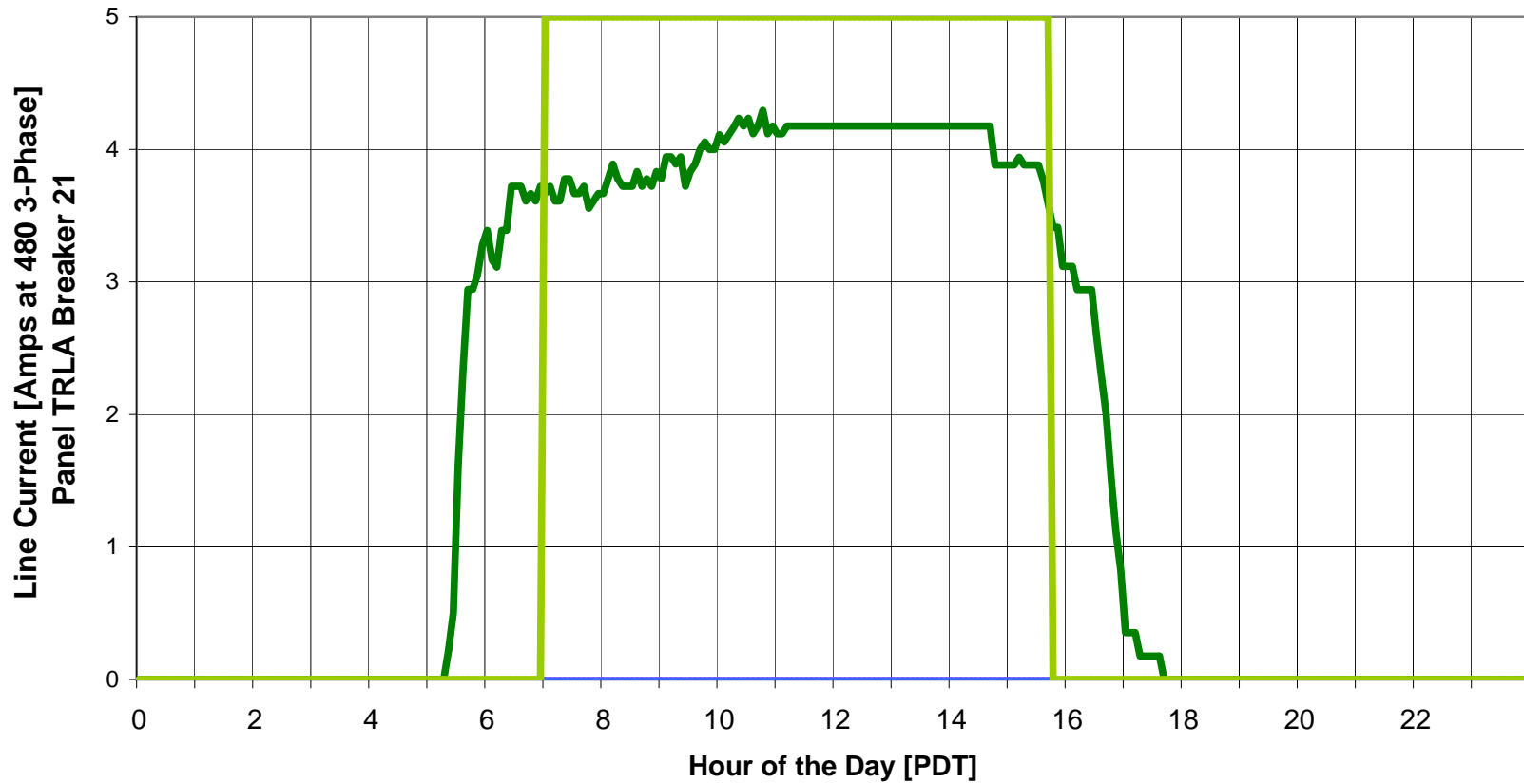


LA County Sheriff Communications Center June/July 2003
Computer Room #158 Lights
Average Daily Load Profile



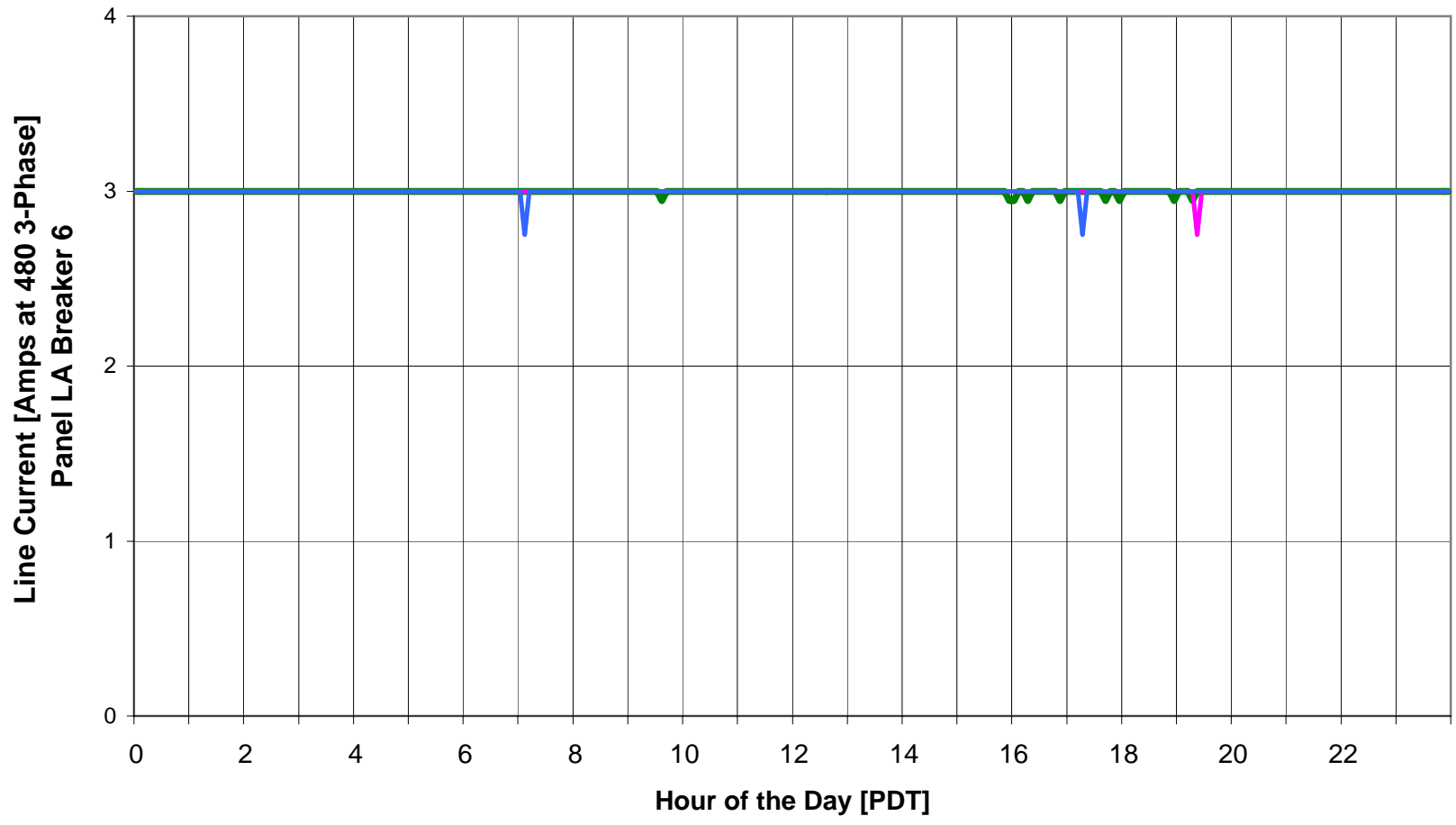
Monday-Friday Saturday Sunday/Holiday

LA County Sheriff Communications Center June/July 2003
Trailer A Office Lights
Average Daily Load Profile



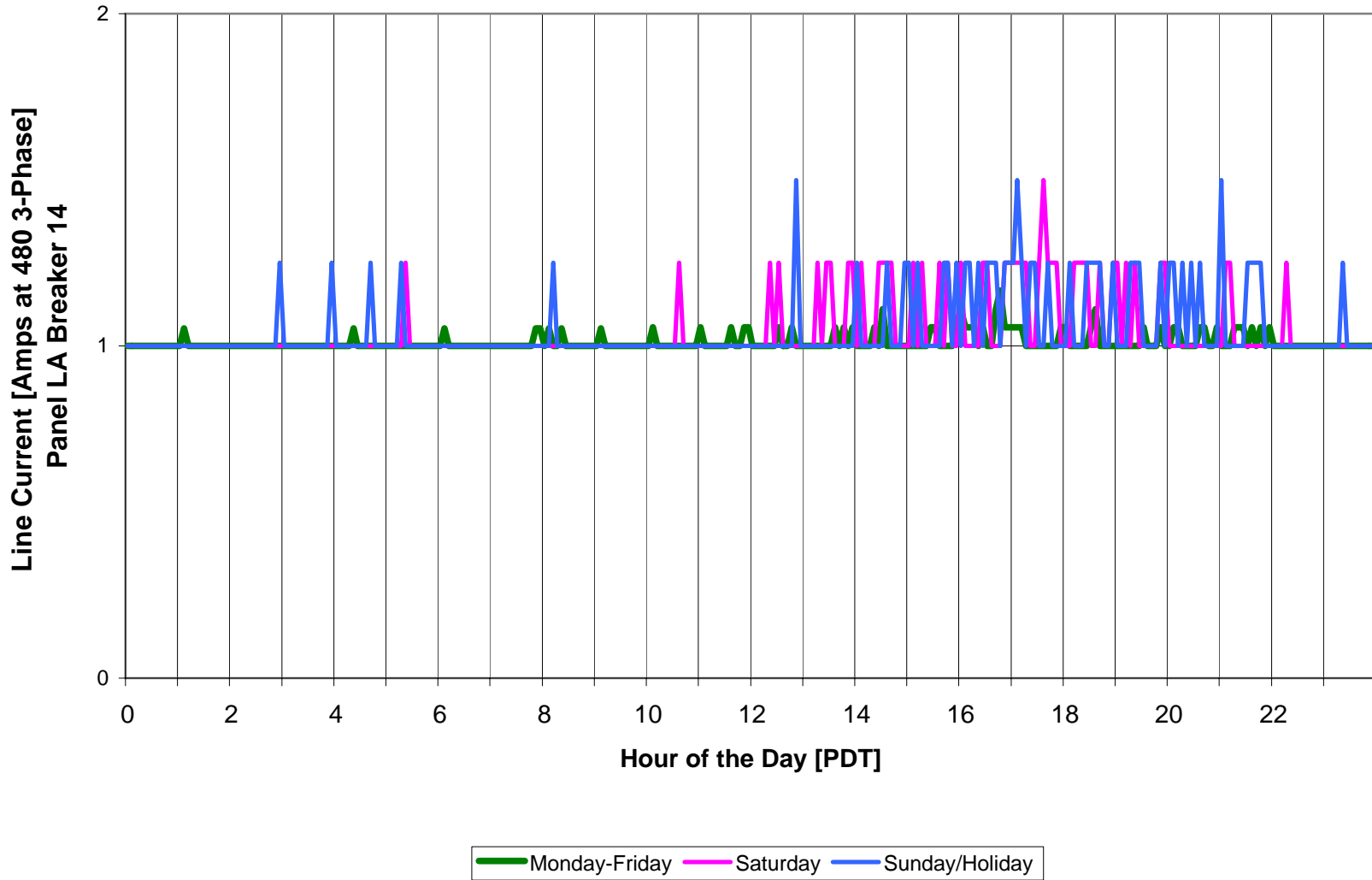
Monday-Friday Saturday Sunday/Holiday Weekday Equivalent

LA County Sheriff Communications Center June/July 2003
Offices 133 Lights
Average Daily Load Profile

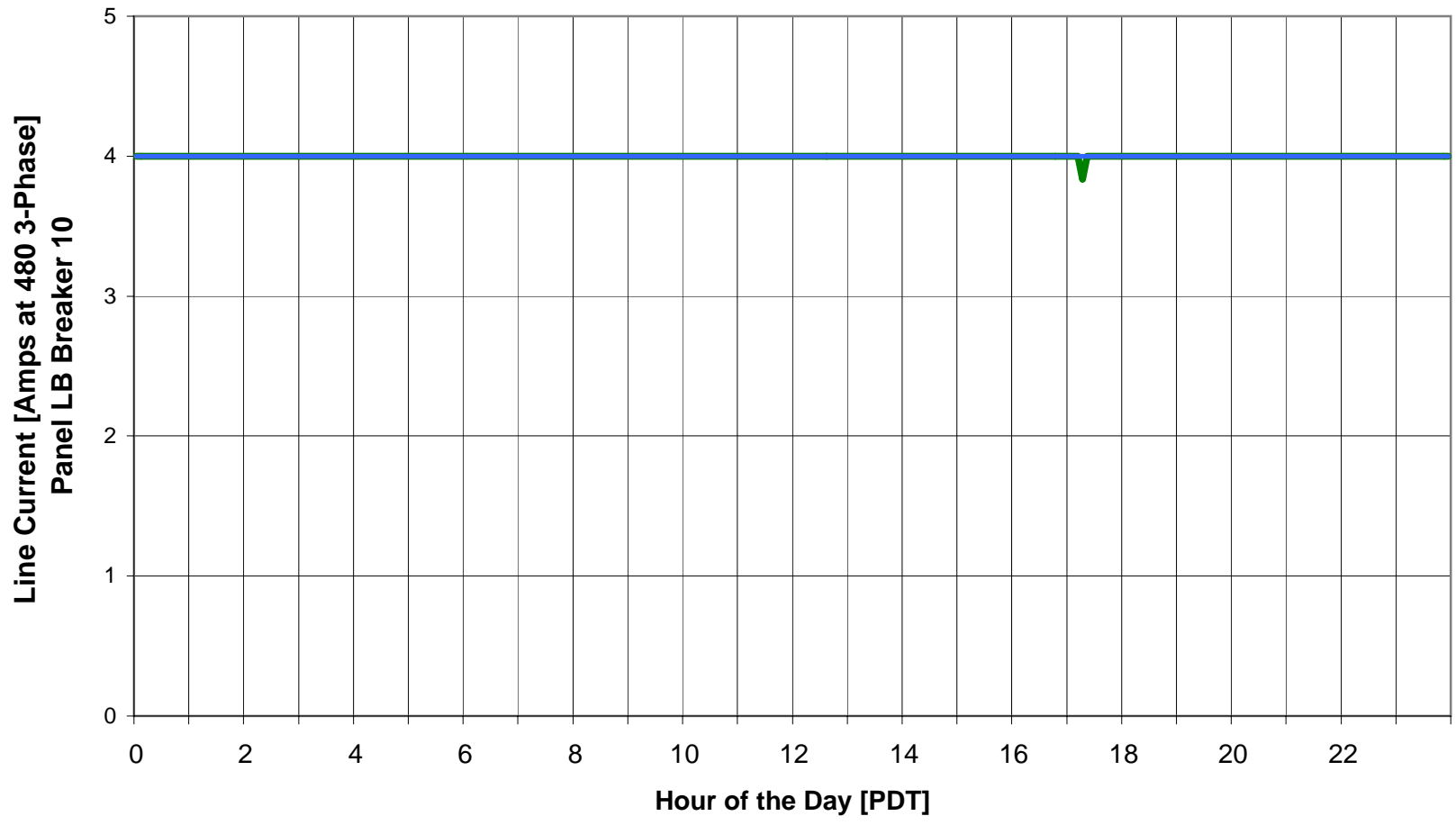


Monday-Friday Saturday Sunday/Holiday

LA County Sheriff Communications Center June/July 2003
Transmitter Room 109 Lights
Average Daily Load Profile



LA County Sheriff Communications Center June/July 2003
Womens Restroom- Locker Room Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
4	Interior Entry	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	1	50	0.050	8760	438	None	Retrofit	ELED2/1		1	New LED exit sign battery back up	1	2	0.002	18	0.048	420
9	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	8	50	0.400	8760	3,504	None	Replace	ELED2/1		1	New LED exit sign battery back up	8	2	0.016	140	0.384	3,364
13	Computer Rm B	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	1	50	0.050	8760	438	None	Replace	ELED2/1		1	New LED exit sign battery back up	1	2	0.002	18	0.048	420
19	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	1	50	0.050	8760	438	None	Replace	ELED2/1		1	New LED exit sign battery back up	1	2	0.002	18	0.048	420
27	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	3	50	0.150	8760	1,314	None	Replace	ELED2/1		1	New LED exit sign battery back up	3	2	0.006	53	0.144	1,261
36	Rm 128 - Assembly	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	3	50	0.150	8760	1,314	None	Replace	ELED2/1		1	New LED exit sign battery back up	3	2	0.006	53	0.144	1,261
39	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	4	50	0.200	8760	1,752	None	Replace	ELED2/1		1	New LED exit sign battery back up	4	2	0.008	70	0.192	1,682
46	Kitchen	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	2	50	0.100	8760	876	None	Replace	ELED2/1		1	New LED exit sign battery back up	2	2	0.004	35	0.096	841
65	Rm 109 - Computer	EITT	Exit	0	Tritium Exit Sign	2	0	0.000	0	0	None	NO CHANGE	EITT		0	NO CHANGE	0	0	0	0	0.000	0
82	Trailer	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	2	50	0.100	8760	876	None	Replace	ELED2/1		1	New LED exit sign battery back up	2	2	0.004	35	0.096	841
																Total Exits	25				1.200	10,512
5	Lobby		Strip	1	1x4, 1 lamp 34W, ES ballast, strip	24	43	1.032	8760	9,040	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	24	28	0.672	5,887	0.360	3,154
6	Lobby		Strip	1	1x2, 1 lamp 20W standard ballast, strip	16	28	0.448	8760	3,924	None	Retrofit	F21ILL-R		1	F17T8 lamp, 1 low watt 1 lamp electronic ballast	16	15	0.24	2,102	0.208	1,822
7	Room - NO ACCESS	F42EE	ESTIMATE - Strip	2	ESTIMATE - 1x4, 2 lamp 34W, ES ballast, strip	5	72	0.360	8760	3,154	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	5	52	0.26	2,278	0.100	876

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
8	Hallway	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	5	72	0.360	8760	3,154	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	5	52	0.26	2,278	0.100	876	
10	Rm 163 - JDIC Computer Lab	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	24	144	3.456	8760	30,275	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballasts	24	62	1.488	13,035	1.968	17,240	
11	Computer Rm A	F43EE	Troffer	3	2x4, 3 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	115	1.380	8760	12,089	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	12	52	0.624	5,466	0.756	6,623	
12	Computer Rm B	F43EE	Troffer	3	2x4, 3 lamp 34W, 2 ES ballasts, recessed, parabolic diffuser	24	115	2.760	8760	24,178	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	24	52	1.248	10,932	1.512	13,245	
14	Office	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	8760	10,092	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	3,644	0.736	6,447	
15	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
16	Rm 159	F42EE	Wrap	2	2x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
18	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
22	Rm 141 - Women's Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
24	Rm 138 - Men's Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
26	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	10	72	0.720	8760	6,307	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	10	52	0.52	4,555	0.200	1,752	
28	Rm 137	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175	
29	Rm 136	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	8760	5,046	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	1,822	0.368	3,224	
29.1	Rm 136	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	8	72	0.576	8760	5,046	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	3,644	0.160	1,402	
29.2	Rm 136	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
30	Rm 132	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1,296	8760	11,353	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	102	0.918	8,042	0.378	3,311	
31	Rm 133 - storage	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1,296	2500	3,240	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	102	0.918	2,295	0.378	945	
32	Rm 130 - Maintenance	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	20	144	2,880	2500	7,200	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	20	102	2.04	5,100	0.840	2,100	
33	Office - NO ACCESS	F44EE	ESTIMATE - Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2500	2,160	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	102	0.612	1,530	0.252	630	
34	Rm 129 - MDCS Training Staff	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	14	144	2,016	2500	5,040	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	14	52	0.728	1,820	1.288	3,220	
35	Rm 128 - Assembly	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	30	144	4,320	2500	10,800	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	30	52	1.56	3,900	2.760	6,900	
38	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	20	72	1,440	8760	12,614	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	20	52	1.04	9,110	0.400	3,504	
40	Rm 127 - Dispatch Equip	F43EE	Strip	1	1x4, 1 lamp 34W, ES ballast, strip	115	43	4,945	8760	43,318	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	115	28	3.22	28,207	1.725	15,111	
41	Rear Office	F41EE	Strip	1	1x4, 1 lamp 34W, ES ballast, strip	28	43	1,204	8760	10,547	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	28	28	0.784	6,868	0.420	3,679	
42	Rear Office	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	3	72	0.216	8760	1,892	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	3	52	0.156	1,367	0.060	526	
43	Rm 127 - Electrical closet	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	0	72	0.000	8760	0	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	0	52	0	0	0.000	0	
44	Xerox Room	F42EE	Wrap	2	1x4, 2 lamp F34T12, ES ballast, surface mount, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175	
44.1	Xerox Room	F42EE	Wrap	2	1x4, 2 lamp F34T12, ES ballast, surface mount, prismatic diffuser	1	52	0.052	8760	456	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	0	52	0.052	456	0.000	0	
45	Kitchen	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	144	1,728	8760	15,137	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	12	102	1.224	10,722	0.504	4,415	
47	Rm 117 - Women's Locker Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	17	72	1,224	8760	10,722	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	17	52	0.884	7,744	0.340	2,978	

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
48	Rm 117 - TV Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175
49	Rm 117 - Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	4	72	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	1,822	0.080	701
50	Rm 121 - Men's Locker Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	2500	1,440	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	520	0.368	920
51	Rm 120 - Men's Rest Room	F42EE	Wrap	2	2x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
52	Rm 124 - Generator Control Rm	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	8	72	0.576	8760	5,046	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	8	52	0.416	3,644	0.160	1,402
53	Rm 123 - Electrical	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
54	Rm 122 - Mechanical	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	6	72	0.432	8760	3,784	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	6	52	0.312	2,733	0.120	1,051
55	Rm 161	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175
57	Rm 113	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
58	Rm 114 - Supply Room	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	12	72	0.864	8760	7,569	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	12	52	0.624	5,466	0.240	2,102
59	Rm 104 - Communication	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	144	1.728	8760	15,137	None	Retrofit	F42ILL		2	F32T8 lamps, 1 std watt 2 lamp electronic ballast	12	59	0.708	6,202	1.020	8,935
60	Rm 102 - Supply	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.184	1,612
61	Rm 103 - Office	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1.296	8760	11,353	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	102	0.918	8,042	0.378	3,311
62	Rm 107 - Office	F44EE	Troffer	4	4x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	Dimmer	Retrofit	F42ILL		2	F32T8 lamps, 1 dimming 2 lamp electronic ballast	2	59	0.118	1,034	0.170	1,489
63	Rm 106	F44EE	Troffer	4	4x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	Dimmer	Retrofit	F42ILL		2	F32T8 lamps, 1 dimming 2 lamp electronic ballast	2	59	0.118	1,034	0.170	1,489

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
63.1	Rm 105	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	2	102	0.204	1,787	0.084	736	
64	Rm 109 - Computer	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	28	144	4.032	8760	35,320	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	28	102	2.856	25,019	1.176	10,302	
66	Dispatch (radio room)	F42EE	Troffer	2	2x4, 2 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	36	72	2.592	8760	22,706	Dimmer	Retrofit	F42ILL		2	F32T8/750 lamps, 1 dimming 2 lamp electronic ballast	36	59	2.124	18,606	0.468	4,100	
67	Dispatch (bridge)	F42EE	Troffer	2	2x4, 2 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	11	72	0.792	8760	6,938	Dimmer	Retrofit	F42ILL		2	F32T8/750 lamps, 1 dimming 2 lamp electronic ballast	11	59	0.649	5,685	0.143	1,253	
68	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	0	72	0.000	8760	0	Dimmer	Retrofit	F42ILL		2	F32T8 lamps, 1 dimming 2 lamp electronic ballast	0	59	0	0	0.000	0	
69	Rm 162 - Shower hall	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, ES ballast	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175	
71	Rm 126 - Generator	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, ES ballast	11	72	0.792	8760	6,938	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	11	52	0.572	5,011	0.220	1,927	
74	Exterior Storage	F42EE	Wrap	2	1x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175	
80	Trailer	F42EE	Wrap	2	1x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	18	72	1.296	8760	11,353	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	18	52	0.936	8,199	0.360	3,154	
81	Trailer	F44EE	Wrap	4	1x4, 4 lamp 34W, 2 ES ballast, surface mount, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.184	1,612	
83	Trailer D - Storage	F42ILL	Wrap	2	1x4, 2 lamp F32T8, electronic ballast, surface mount, prismatic diffuser	6	59	0.354	8760	3,101	None	NO CHANGE	F42ILL		2	NO CHANGE	0	59	0.354	3,101	0.000	0	
84	Garage	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, ES ballast	30	72	2.160	8760	18,922	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	30	52	1.56	13,666	0.600	5,256	
86	Trailer	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	28	144	4.032	8760	35,320	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	28	62	1.736	15,207	2.296	20,113	
87	Hallway	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.184	1,612	
88	Office	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	8760	5,046	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	4	62	0.248	2,172	0.328	2,873	

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures								Savings			
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
89	Conference Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	8760	5,046	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	4	62	0.248	2,172	0.328	2,873	
91	Office 1	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
92	Office 2	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
93	CR	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	6	72	0.432	8760	3,784	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	2,733	0.120	1,051	
94	Closet	F42EE	Wrap	2	1x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175	
95	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
96	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350.4	
Total T12-T8																	699					25.854	189,635
1	Exterior Entry	I100/1	Square	1	1 lamp 100W recessed square	12	100	1.200	4380	5,256	None	Retrofit	CFQ28/1		1	27W compact fluorescent spring lamp	12	27	0.324	1,419	0.876	3,837	
2	Exterior Entry		Tread Light	1	1 lamp F6T5	18	6	0.108	4380	473	None	NO CHANGE			1	NO CHANGE	0	6	0.108	473	0.000	0	
3	Interior Entry	I100/1	Square	1	1 lamp 100W recessed square	4	100	0.400	8760	3,504	None	Retrofit	CFQ28/1		1	27W compact fluorescent spring lamp	4	27	0.108	946	0.292	2,558	
17	Rm 164 - Electrical closet	I60/1	Keyless	1	1 lamp 60W A keyless	2	60	0.120	780	94	None	Retrofit			1	19W compact fluorescent spring lamp	2	19	0.038	30	0.082	64	
20	Hallway	I60/1	Can	1	1 lamp 60W A downlight can	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359	

Contractor As-Built Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures										Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr				
21	Rm 141 - Women's Rest Room	I60/1	Square	1	1 lamp 60W A recessed square	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359				
23	Rm 138 - Men's Rest Room	I60/1	Square	1	1 lamp 60W A recessed square	2	60	0.120	8760	1,051	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	333	0.082	718				
25	Janitor closet	I60/1	Square	1	1 lamp 60W A recessed square	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359				
37	Rm 128 - Assembly	I150/1	Track	1	1 lamp 150W track head flood	8	150	1.200	8760	10,512	Dimmer	NO CHANGE			1	NO CHANGE	0	150	1.2	10,512	0.000	0				
56	Rm 115 - Janitor	I25/1	Keyless	1	1 lamp 25W A Keyless	1	25	0.025	780	20	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.006	5				
68.1	Exterior Rear Entry	CF15/1-SCRW	Square	1	1 lamp 15W compact fluorescent screw-in	4	15	0.060	4380	263	None	NO CHANGE	CF15/1-SCRW		1	NO CHANGE	0	15	0.06	263	0.000	0				
70	Rm 125 - Shower	I60/1	Jelly Jar	1	1 lamp 60W A Jelly Jar	1	60	0.060	8760	526	None	NO CHANGE	I60/1		1	NO CHANGE	0	60	0.06	526	0.000	0				
72	Exterior Entry	I60/1	Square	1	1 lamp 60W A recessed square	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359				
73	Exterior Storage	CFQ15/1	Can	1	1 lamp 15W downlight can	9	15	0.135	780	105	None	NO CHANGE	CFQ15/1		1	NO CHANGE	0	15	0.135	105	0.000	0				
75	Rear Exterior		Tread Light	1	1 lamp F6T5 tread light	8	6	0.048	4380	210	None	NO CHANGE			1	NO CHANGE	0	6	0.048	210	0.000	0				
77	Exterior Entry		Tread Light	1	1 lamp F6T5 tread light	8	6	0.048	4380	210	None	NO CHANGE			1	NO CHANGE	0	6	0.048	210	0.000	0				
78	Exterior Entry	CF15/1-SCRW	Can	1	1 lamp 15W compact fluorescent screw-in	8	15	0.120	4380	526	None	NO CHANGE	CF15/1-SCRW		1	NO CHANGE	0	15	0.12	526	0.000	0				
84.1	Exterior		Pole Head	1	Unknown	21	0									NO CHANGE	0	0								
																Total INCAN							1.502	8.618		
						Total	843	68.933		519,861											Total	749	40	311,096	28.556	208,765

Aloha Systems Measured Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures									Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
4	Interior Entry	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	1	50	0.050	8760	438	None	Retrofit	ELED2/1		1	New LED exit sign battery back up	1	2	0.002	18	0.048	420
9	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	8	50	0.400	8760	3,504	None	Replace	ELED2/1		1	New LED exit sign battery back up	8	2	0.016	140	0.384	3,364
13	Computer Rm B	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	1	50	0.050	8760	438	None	Replace	ELED2/1		1	New LED exit sign battery back up	1	2	0.002	18	0.048	420
19	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	1	50	0.050	8760	438	None	Replace	ELED2/1		1	New LED exit sign battery back up	1	2	0.002	18	0.048	420
27	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	3	50	0.150	8760	1,314	None	Replace	ELED2/1		1	New LED exit sign battery back up	3	2	0.006	53	0.144	1,261
36	Rm 128 - Assembly	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	3	50	0.150	8760	1,314	None	Replace	ELED2/1		1	New LED exit sign battery back up	3	2	0.006	53	0.144	1,261
39	Hallway	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	4	50	0.200	8760	1,752	None	Replace	ELED2/1		1	New LED exit sign battery back up	4	2	0.008	70	0.192	1,682
46	Kitchen	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	2	50	0.100	8760	876	None	Replace	ELED2/1		1	New LED exit sign battery back up	2	2	0.004	35	0.096	841
65	Rm 109 - Computer	EITT	Exit	0	Tritium Exit Sign	0	0	0.000	0	0	None	NO CHANGE	EITT		0	NO CHANGE	0	0	0	0	0.000	0
82	Trailer	EI25/2	Exit	2	2 lamp 25W T6 1/2 exit sign	2	50	0.100	8760	876	None	Replace	ELED2/1		1	New LED exit sign battery back up	2	2	0.004	35	0.096	841
																Total Exits	25				1.200	10,512
5	Lobby	F41EE	Strip	1	1x4, 1 lamp 34W, ES ballast, strip	24	43	1.032	8760	9,040	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	24	28	0.672	5,887	0.360	3,154
6	Lobby	F21SS	Strip	1	1x2, 1 lamp 20W standard ballast, strip	16	28	0.448	8760	3,924	None	Retrofit	F21ILL-R		1	F17T8 lamp, 1 low watt 1 lamp electronic ballast	16	15	0.24	2,102	0.208	1,822
6.5	Lobby Recessed Ceiling	F42EE		2	F42EE	30	72	2.160	8760	18,922			F42ILL			F42ILL	30	52	1.56	13,666	0.600	5,256

Aloha Systems Measured Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures									Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
7	Room - NO ACCESS	F42EE	ESTIMATE - Strip	2	ESTIMATE - 1x4, 2 lamp 34W, ES ballast, strip	5	72	0.360	8760	3,154	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	5	52	0.26	2,278	0.100	876
8	Hallway	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	5	72	0.360	8760	3,154	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	5	52	0.26	2,278	0.100	876
10	Rm 163 - JDIC Computer Lab	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	24	144	3.456	8725	30,154	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballasts	24	62	1.488	12,983	1.968	17,171
11	Computer Rm A	F43EE	Troffer	3	2x4, 3 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	115	1.380	8725	12,041	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	12	52	0.624	5,444	0.756	6,596
12	Computer Rm B [Room 158]	F43EE	Troffer	3	2x4, 3 lamp 34W, 2 ES ballasts, recessed, parabolic diffuser	24	115	2.760	8725	24,081	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	24	52	1.248	10,889	1.512	13,192
14	Office [MDCS Programming]	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	8725	10,051	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	3,630	0.736	6,422
15	Office [MDCS Programming]	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		1	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	32	0.064	561	0.080	701
16	Rm 159	F42EE	Wrap	2	2x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
18	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
22	Rm 141 - Women's Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
24	Rm 138 - Men's Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
26	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	10	72	0.720	8760	6,307	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	10	52	0.52	4,555	0.200	1,752
28	Rm 137	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175
29	Rm 136	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	8725	5,026	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	1,815	0.368	3,211
29.1	Rm 136	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	8	72	0.576	8760	5,046	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	3,644	0.160	1,402

Aloha Systems Measured Savings

11. Sheriff Communication Center

Existing Fixtures																							New Fixtures						Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr								
29.2	Rm 136	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350								
30	Rm 132	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1.296	2785	3,609	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	102	0.918	2,557	0.378	1,053								
31	Rm 133 - storage	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1.296	2785	3,609	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	102	0.918	2,557	0.378	1,053								
32	Rm 130 - Maintenance	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	20	144	2.880	2785	8,021	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 2 lamp electronic ballast	20	102	2.04	5,681	0.840	2,339								
33	Office - Lieutenant	F44EE	STIMATE - Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2785	2,406	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	102	0.612	1,704	0.252	702								
34	Rm 129 - MDCS Training Staff	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	14	144	2.016	2785	5,615	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	14	52	0.728	2,027	1.288	3,587								
35	Rm 128 - Assembly [classroom]	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	30	144	4.320	2500	10,800	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	30	52	1.56	3,900	2.760	6,900								
38	Hallway	F42EE	Troffer	2	2x2, 2 lamp 34W Ubend, ES ballast, surface mount, prismatic diffuser	20	72	1.440	8760	12,614	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	20	52	1.04	9,110	0.400	3,504								
40	Rm 127 - Dispatch Equip	F41EE	Strip	1	1x4, 1 lamp 34W, ES ballast, strip	115	43	4.945	2785	13,772	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	115	28	3.22	8,968	1.725	4,804								
41	Rear Office [127]	F41EE	Strip	1	1x4, 1 lamp 34W, ES ballast, strip	28	43	1.204	2785	3,353	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	28	28	0.784	2,183	0.420	1,170								
42	Rear Office [127]	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	3	72	0.216	2785	602	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	3	52	0.156	434	0.060	167								
43	Rm 127 - Electrical closet [generator room]	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	0	72	0.000	8760	0	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	0	52	0	0	0.000	0								
44	Xerox Room	F42EE	Wrap	2	1x4, 2 lamp F34T12, ES ballast, surface mount, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175								
44.1	Xerox Room	F42EE	Wrap	2	1x4, 2 lamp F34T12, ES ballast, surface mount, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175								
45	Kitchen	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	144	1.728	8760	15,137	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 4 lamp electronic ballast	12	52	0.624	5,466	1.104	9,671								

Aloha Systems Measured Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures									Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
47	Rm 117 - Women's Locker Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	17	72	1.224	8760	10,722	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	17	52	0.884	7,744	0.340	2,978
48	Rm 117 - TV Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175
49	Rm 117 - Rest Room	F42EE	Troffer	2	1x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	4	72	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	1,822	0.080	701
50	Rm 121 - Men's Locker Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	8760	5,046	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	1,822	0.368	3,224
51	Rm 120 - Men's Rest Room	F42EE	Wrap	2	2x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
52	Rm 124 - Generator Control Rm	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	8	72	0.576	4380	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	8	52	0.416	1,822	0.160	701
53	Rm 123 - Electrical	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	2	72	0.144	4380	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	2	52	0.104	456	0.040	175
54	Rm 122 - Mechanical	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	6	72	0.432	4380	1,892	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	6	52	0.312	1,367	0.120	526
55	Rm 161	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175
57	Rm 113	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350
58	Rm 114 - Supply Room	F42EE	Strip	2	1x4, 2 lamp 34W, ES ballast, strip	12	72	0.864	8760	7,569	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	12	52	0.624	5,466	0.240	2,102
59	Rm 104 - Communication	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	144	1.728	8760	15,137	None	Retrofit	F42ILL		2	F32T8 lamps, 1 std watt 2 lamp electronic ballast	12	59	0.708	6,202	1.020	8,935
60	Rm 102 - Supply	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.184	1,612
61	Rm 103 - Office [commander]	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1.296	8760	11,353	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	102	0.918	8,042	0.378	3,311
62	Rm 107 - Office [radio lieut.]	F44EE	Troffer	4	4x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	Dimmer	Retrofit	F42ILL		2	F32T8 lamps, 1 dimming 2 lamp electronic ballast	2	59	0.118	1,034	0.170	1,489

Aloha Systems Measured Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
63	Rm 106	F44EE	Troffer	4	4x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	Dimmer	Retrofit	F42ILL		2	F32T8 lamps, 1 dimming 2 lamp electronic ballast	2	59	0.118	1,034	0.170	1,489
63.1	Rm 105	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	2	102	0.204	1,787	0.084	736
64	Rm 109 - Computer	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	28	144	4.032	8760	35,320	None	Retrofit	F44ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	28	102	2.856	25,019	1.176	10,302
66	Dispatch (radio room)	F42EE	Troffer	2	2x4, 2 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	36	72	2.592	8760	22,706	Dimmer	Retrofit	F42ILL		2	F32T8/750 lamps, 1 dimming 2 lamp electronic ballast	36	59	2.124	18,606	0.468	4,100
67	Dispatch (bridge)	F42EE	Troffer	2	2x4, 2 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	11	72	0.792	8760	6,938	Dimmer	Retrofit	F42ILL		2	F32T8/750 lamps, 1 dimming 2 lamp electronic ballast	11	59	0.649	5,685	0.143	1,253
68	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	0	72	0.000	8760	0	Dimmer	Retrofit	F42ILL		2	F32T8 lamps, 1 dimming 2 lamp electronic ballast	0	59	0	0	0.000	0
69	Rm 162 - Shower hall	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, ES ballast	1	72	0.072	8760	631	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	1	52	0.052	456	0.020	175
71	Rm 126 - Generator	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, ES ballast	11	72	0.792	4380	3,469	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	11	52	0.572	2,505	0.220	964
74	Exterior Storage	F42EE	Wrap	2	1x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	4380	315	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	228	0.020	88
80	Trailer	F42EE	Wrap	2	1x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	18	72	1.296	2174	2,818	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	18	52	0.936	2,035	0.360	783
81	Trailer	F44EE	Wrap	4	1x4, 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	2174	626	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	226	0.184	400
83	Trailer D - Storage	F42ILL	Wrap	2	1x4, 2 lamp F32T8, electronic ballast, surface mount, prismatic diffuser	0	59	0.000	2174	0	None	NO CHANGE	F42ILL		2	NO CHANGE	0	59	0	0	0.000	0
84	Garage	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, ES ballast	30	72	2.160	4380	9,461	None	Retrofit	F42ILL-R		2	F32T8 lamp, 1 low watt 2 lamp electronic ballast	30	52	1.56	6,833	0.600	2,628
86	Trailer	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	28	144	4.032	2174	8,766	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	28	62	1.736	3,774	2.296	4,992
87	Hallway	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2174	626	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	226	0.184	400

Aloha Systems Measured Savings
11. Sheriff Communication Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
88	Office	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	2174	1,252	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	4	62	0.248	539	0.328	713	
89	Conference Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	2174	1,252	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	4	62	0.248	539	0.328	713	
91	Office 1	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	2174	313	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	226	0.040	87	
92	Office 2	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	2174	313	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	226	0.040	87	
93	CR	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	6	72	0.432	2174	939	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	678	0.120	261	
94	Closet	F42EE	Wrap	2	1x4, 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	2174	157	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	113	0.020	43	
95	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	2174	313	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	226	0.040	87	
96	Office	F42EE	Troffer	2	2x4, 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	2174	313	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	226	0.040	87	
																Total T12-T8	730				27.114	156,849	
1	Exterior Entry	CFQ26/1	Square	1	Existing CFL	12	27	0.324	4380	1,419	None	Retrofit	CF26/1-SCRW		1	27W compact fluorescent spring lamp	12	27	0.324	1,419	0.000	0	
3	Interior Entry	CFQ26/1	Square	1	Existing CFL	4	27	0.108	8760	946	None	Retrofit	CF26/1-SCRW		1	27W compact fluorescent spring lamp	4	27	0.108	946	0.000	0	
17	Rm 164 - Electrical closet	I60/1	Keyless	1	1 lamp 60W A keyless	2	60	0.120	780	94	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	30	0.082	64	
20	Hallway	I60/1	Can	1	1 lamp 60W A downlight can	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359	
21	Rm 141 - Women's Rest Room	I60/1	Square	1	1 lamp 60W A recessed square	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359	

Aloha Systems Measured Savings
11. Sheriff Communication Center

Aloha Systems Measured Savings 11. Sheriff Communication Center																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
23	Rm 138 - Men's Rest Room	I60/1	Square	1	1 lamp 60W A recessed square	2	60	0.120	8760	1,051	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	333	0.082	718
25	Janitor closet	I60/1	Square	1	1 lamp 60W A recessed square	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359
37	Rm 128 - Assembly	I150/1	Track	1	1 lamp 150W track head flood	0	150	0.000	8760	0	Dimmer	NO CHANGE	I150/1		1	NO CHANGE	0	150	0	0	0.000	0
56	Rm 115 - Janitor	I25/1	Keyless	1	1 lamp 25W A Keyless	1	25	0.025	780	20	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.006	5
68.1	Exterior Rear Entry	CF15/1-SCRW	Square	1	1 lamp 15W compact fluorescent screw-in	0	15	0.000	4380	0	None	NO CHANGE	CF15/1-SCRW		1	NO CHANGE	0	15	0	0	0.000	0
70	Rm 125 - Shower	I60/1	Jelly Jar	1	1 lamp 60W A Jelly Jar	0	60	0.000	8760	0	None	NO CHANGE	I60/1		1	NO CHANGE	0	60	0	0	0.000	0
72	Exterior Entry	I60/1	Square	1	1 lamp 60W A recessed square	1	60	0.060	8760	526	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	166	0.041	359
73	Exterior Storage	CRQ15/1	Can	1	1 lamp 15W downlight can	0	15	0.000	780	0	None	NO CHANGE	CRQ15/1		1	NO CHANGE	0	15	0	0	0.000	0
78	Exterior Entry	CF15/1-SCRW	Can	1	1 lamp 15W compact fluorescent screw-in	0	15	0.000	4380	0	None	NO CHANGE	CF15/1-SCRW		1	NO CHANGE	0	15	0	0	0.000	0
																Total INCAN	25				0.334	2,224
2	Exterior Entry		Tread Light	1	1 lamp F6T5	0	6	0.000	4380	0	None	NO CHANGE			1	NO CHANGE	0	6	0	0	0.000	0
75	Rear Exterior		Tread Light	1	1 lamp F6T5 tread light	0	6	0.000	4380	0	None	NO CHANGE			1	NO CHANGE	0	6	0	0	0.000	0
77	Exterior Entry		Tread Light	1	1 lamp F6T5 tread light	0	6	0.000	4380	0	None	NO CHANGE			1	NO CHANGE	0	6	0	0	0.000	0
84.1	Exterior		Pole Head	1	Unknown	0	0	0.000		0						NO CHANGE	0	0	0	0	0.000	0
																Total ?	0					

Aloha Systems Measured Savings
11. Sheriff Communication Center

Aloha Systems Measured Savings 11. Sheriff Communication Center																							
Existing Fixtures											New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
					Total	780		67.812		404,279							Total	780		39.164	234,695	28.648	169,584

Sheriff Communication Center - 1277 N. Eastern Avenue



Sheriff's Communication's Center Entrance



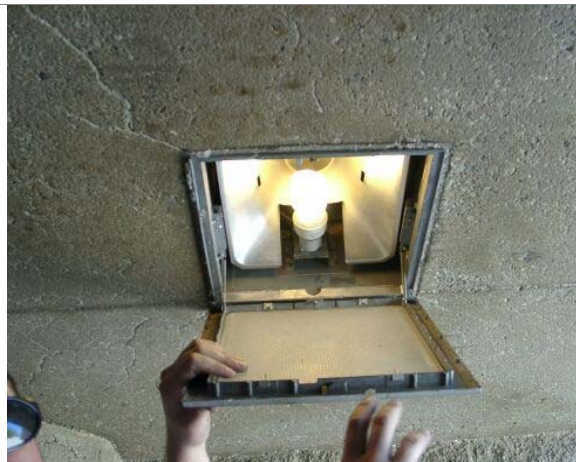
Sheriff's Communication's Center Entrance



Sheriff's Communication's Center Lobby



Fluorescent Exit Sign



Outdoor CFL Light Fixture



2-Lamp Light Fixture And Ballast

Site Measurement and Verification Report

Site Number 12
Biscailuz Center - Sheriffs
1060 N. Eastern Ave., Los Angeles
SCE Account 3-000-0599-41

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	143,893 kWh
Contractor's As-Built Estimate	125,300 kWh
<i>Ex-Ante</i> Evaluation	139,586 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	209,722 kWh

Site Description

The Biscailuz Center is a site of a previous correctional/recovery facility. The center no longer houses inmates but instead is used as a training facility, office complex, and multi-purpose complex. The areas in use are administrative offices, classrooms, a shooting range, carpenter shop, carpet shop, storage warehouse, and other miscellaneous-use areas. The large dormitories that previously housed inmates are no longer in use.

Spreadsheet Errors

The spreadsheets were presented to us with direct values rather than formulas. Upon conversion to formulas, occasionally the rows did not multiply correctly and occasionally the rows did not add exactly to the reported total. Often this was the case when “no change” was reported because of the use of zero quantities. We corrected these problems by setting both the “existing” and “new” quantities to zero for any line item in which there were not fixtures changes. This will allow both the fixture and kWh sums to accurately represent the project. The purpose of the lighting spreadsheets is not to document every light in the facility, but rather to document only those that were retrofitted.

Changes made as a result of correcting the contractor's spreadsheet errors are highlighted in lavender on Aloha's “metered” spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor's as-built spreadsheet.

Preliminary Site Visit

The site was visited on February 18, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

During the visit many vacant dormitories were not being used at all. There were also no plans to use these buildings in the near future. Yet the contractor spreadsheets were including these vacant areas in the retrofit. This was pointed out to LA County staff. As a result of our observation, these buildings were removed from the lighting retrofit plan.

Post-Retrofit Audit

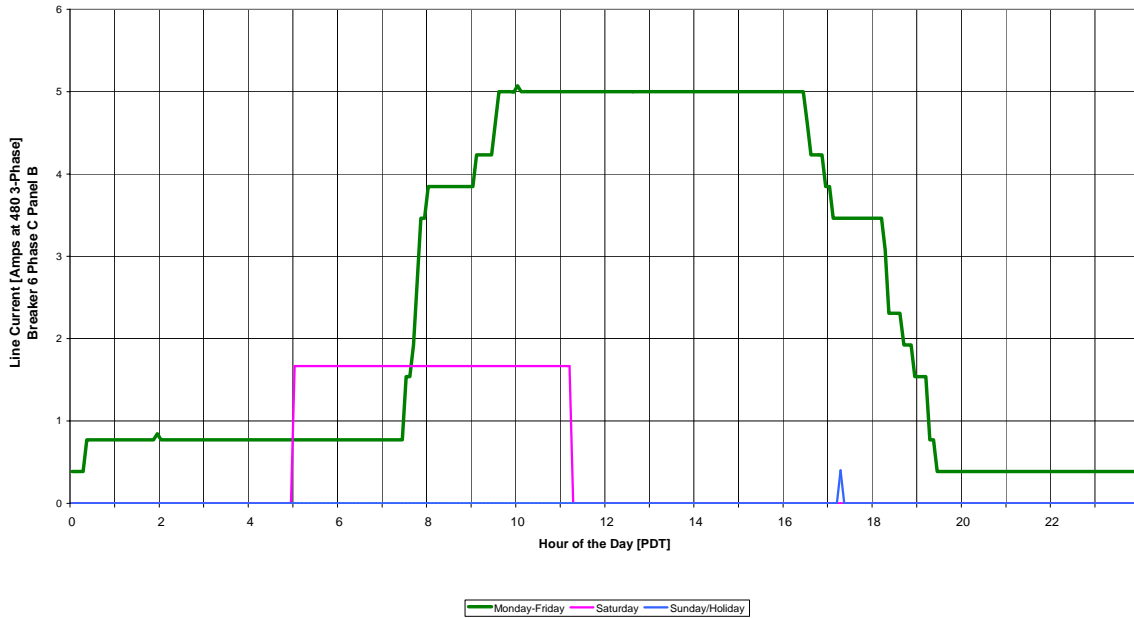
The site was again visited on November 20, 2003. We specifically re-verified the observations noted during the preliminary site visit. LA County staff decided not to retrofit the vacant areas we pointed out, because no savings would be achieved from an area that is not in use.

Metered Operating Hours

This facility has such varying operating hours that dataloggers were installed to get a general understanding of the hours of operation of the facility. The locations that we chose to monitor are areas that are very active in use. The areas were also chosen based on the amount of lights that can be represented.

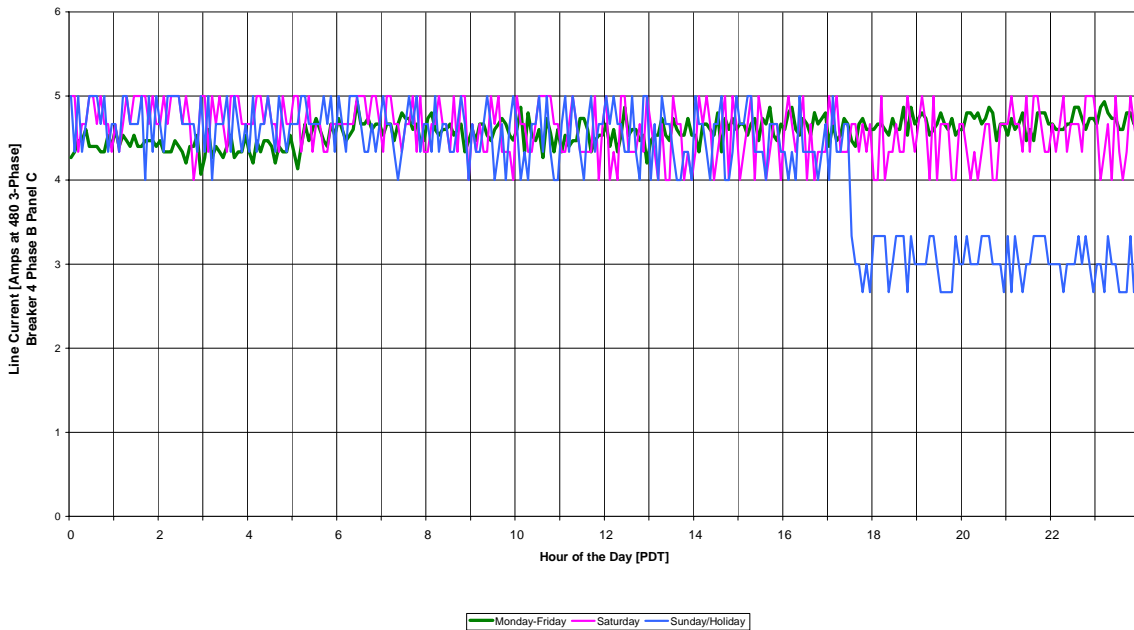
Offices: The load profile on the following page represents 12 fluorescent lamps located in offices. These lights are most active between 10:00 a.m. and 4:00 p.m. On Saturday the load profile shows that there is a small load between 5:00 a.m. and 11:00 a.m. Estimating from the load profile the full load equivalent hours of operation is 3028 hours per year. The contractor as-built spreadsheet's full load equivalent hours of operation is 2250 hours per year. Greater savings are achieved in these areas because the equivalent hours of operation are higher than anticipated.

LA County Biscailuz Recovery Center Nov./Dec. 2003
Office Lights
Average Daily Load Profile

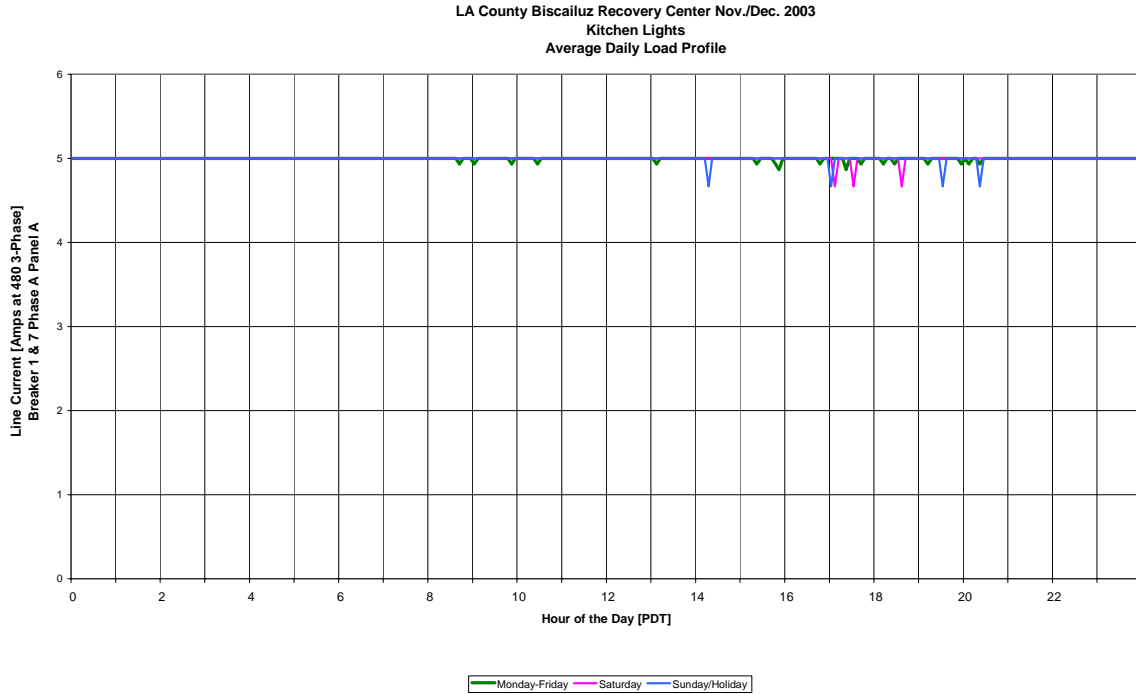


Men's Locker Room: The load profile below represents the lights located in the men's locker room in the main administration building. The lights operated continuously except for a shut-off period on one Sunday evening. The estimated full load equivalent hours of operation are 8599 hours per year. The contractor as built spreadsheet full load equivalent hours of operation for the men's locker room is 8760 hours per year.

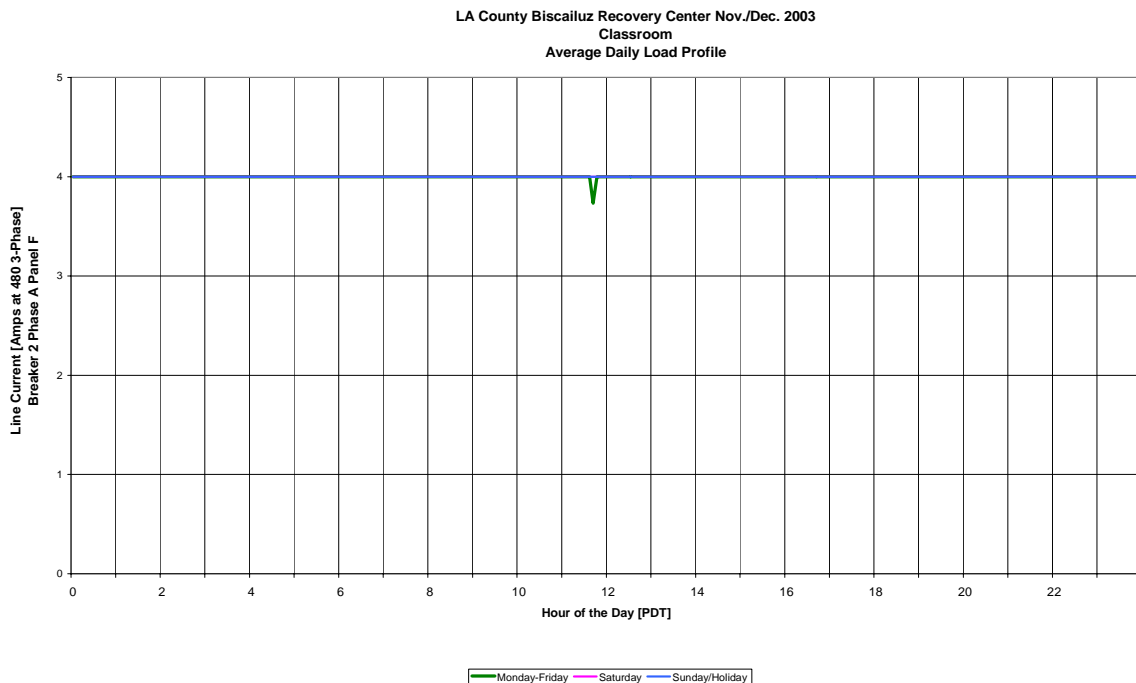
LA County Biscailuz Recovery Center Nov./Dec. 2003
Men's Locker Room
Average Daily Load Profile



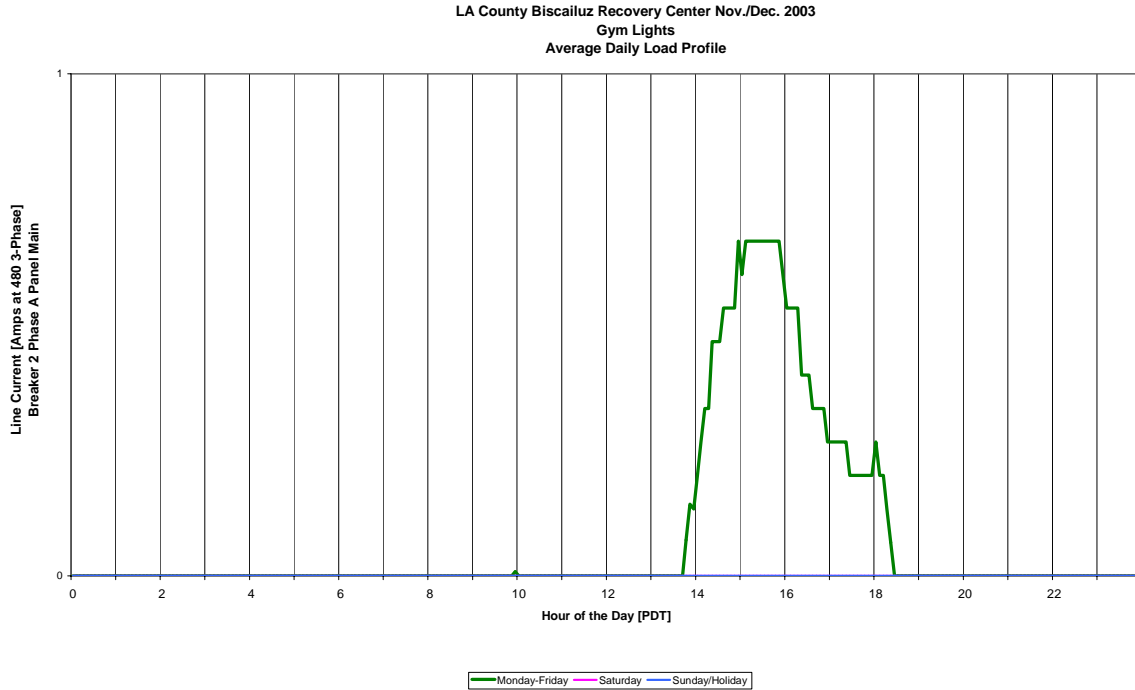
Kitchen: The load profile below represents the lights in the main kitchen area. The load profile shows that the kitchen lights do not turn off. The estimated full load equivalent hours of operation are 8760 hours per year. The contractor had used 2250 hours per year.



Classroom: The load profile below represents lights in a classroom. The load profile show that these lights are never turned off. Therefore the full load equivalent operating hours are 8760 hours per year.



Gym: The load profile below represents the gym lights. These lights are operated on an on-demand basis and have sporadic hours of operation which average to a full load equivalent of 533 hours per year. The contractor’s spreadsheet showed 2250 hours per year.



The offices operating time (3028) was assigned to general offices, lobbies, hallways, and entries used by staff. This value is slightly higher than the contractor’s 2250 h/yr value and was highlighted in tan. This value was also used for offices and miscellaneous areas in other sections of the center, including classrooms.

The kitchen operating time (8760) was assigned to the kitchen and its adjacent equipment rooms. The lights in the kitchen have no available light switch other than the breakers themselves. This value is higher than the contractor’s 2250 h/yr value and was highlighted in tan.

The classroom operating time (8760) was assigned only to the classrooms in the same building as the kitchen and was highlighted in tan. All the other classrooms were not assigned this operating time due to the fact that all to other classrooms are in other buildings with different operating behaviors.

The gym operating time (533) was assigned only to the gym. Its monitored operation showed low and sporadic usage of the lights leading to a much lower operating time than the estimated time of 2250 h/yr by the contractor. The corrected operating hours were highlighted in tan.

Some storage, mechanical, and other seldom-occupied rooms were changed from 2250 to 780 h/yr, the contractor’s generic number for such rooms. These changes were highlighted in yellow.

Energy Savings Calculations

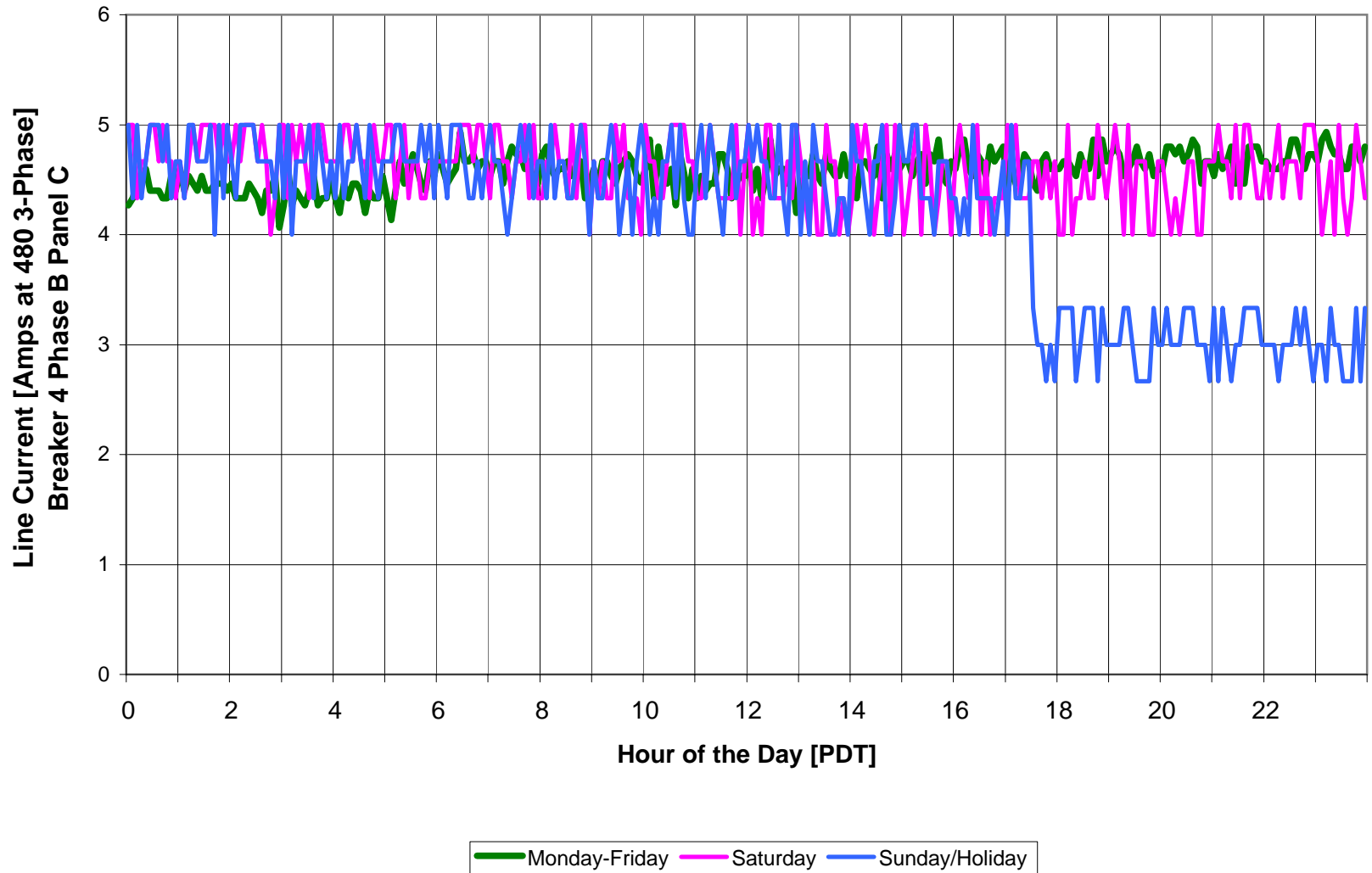
The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

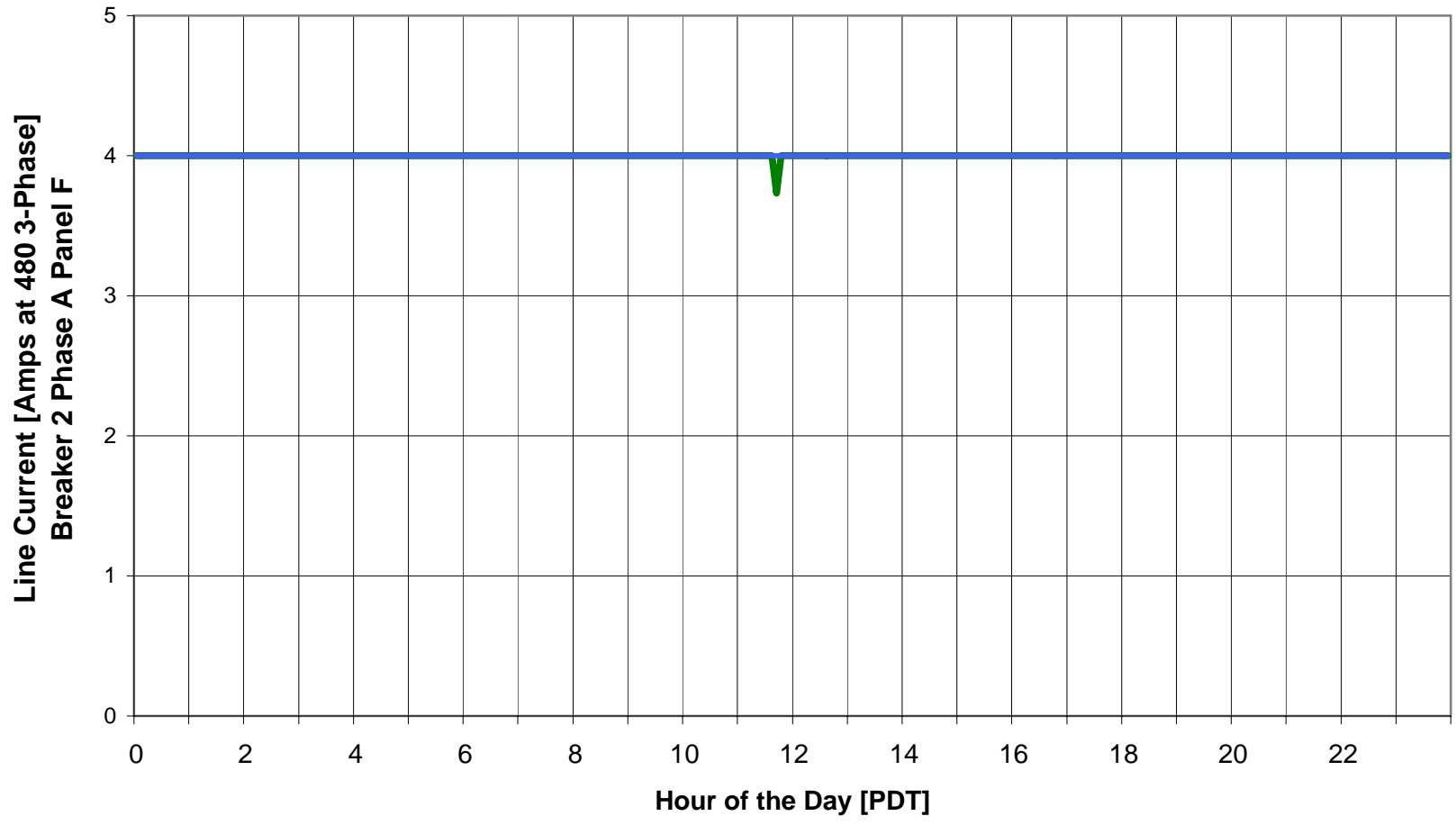
Biscailuz Center Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	30	8400	30	8,432	10,827	8,432
T12 to T8	1096	115895	659	96,513	113,763	182,586
Inc to CFL	152	19598	95	20,355	14,996	18,705
Total	1278	143,893	784	125,300	139,586	209,722

The *ex-post* energy savings estimate is higher than the county’s and the contractor’s estimates or the *ex-ante* calculation primarily because of the longer operating hours observed, including both the sections that were observed to operate 24 hours per day and the general office areas that operated somewhat more than the assumed value.

LA County Biscailuz Recovery Center Nov./Dec. 2003
Men's Locker Room
Average Daily Load Profile

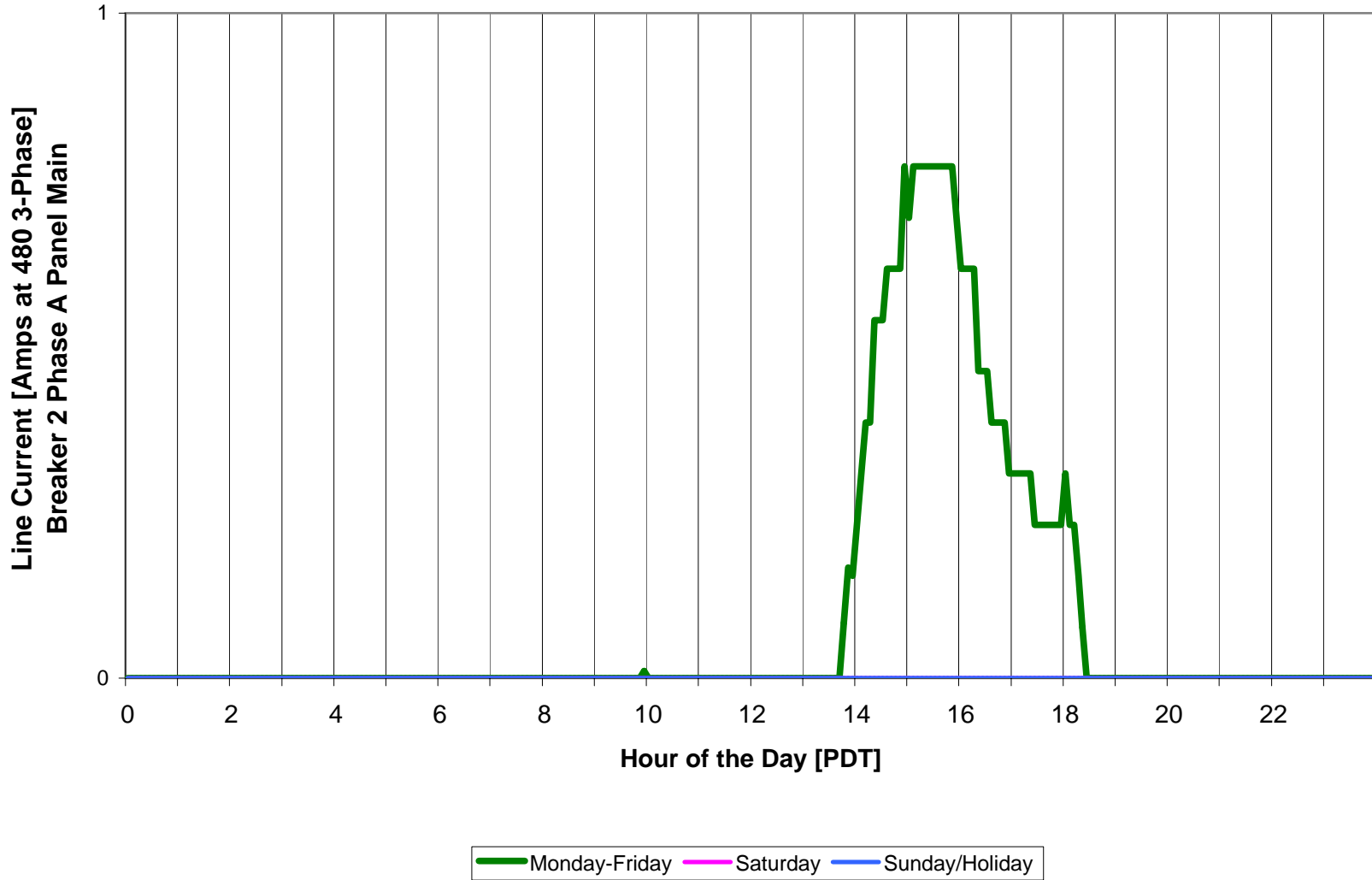


LA County Biscailuz Recovery Center Nov./Dec. 2003
Classroom
Average Daily Load Profile

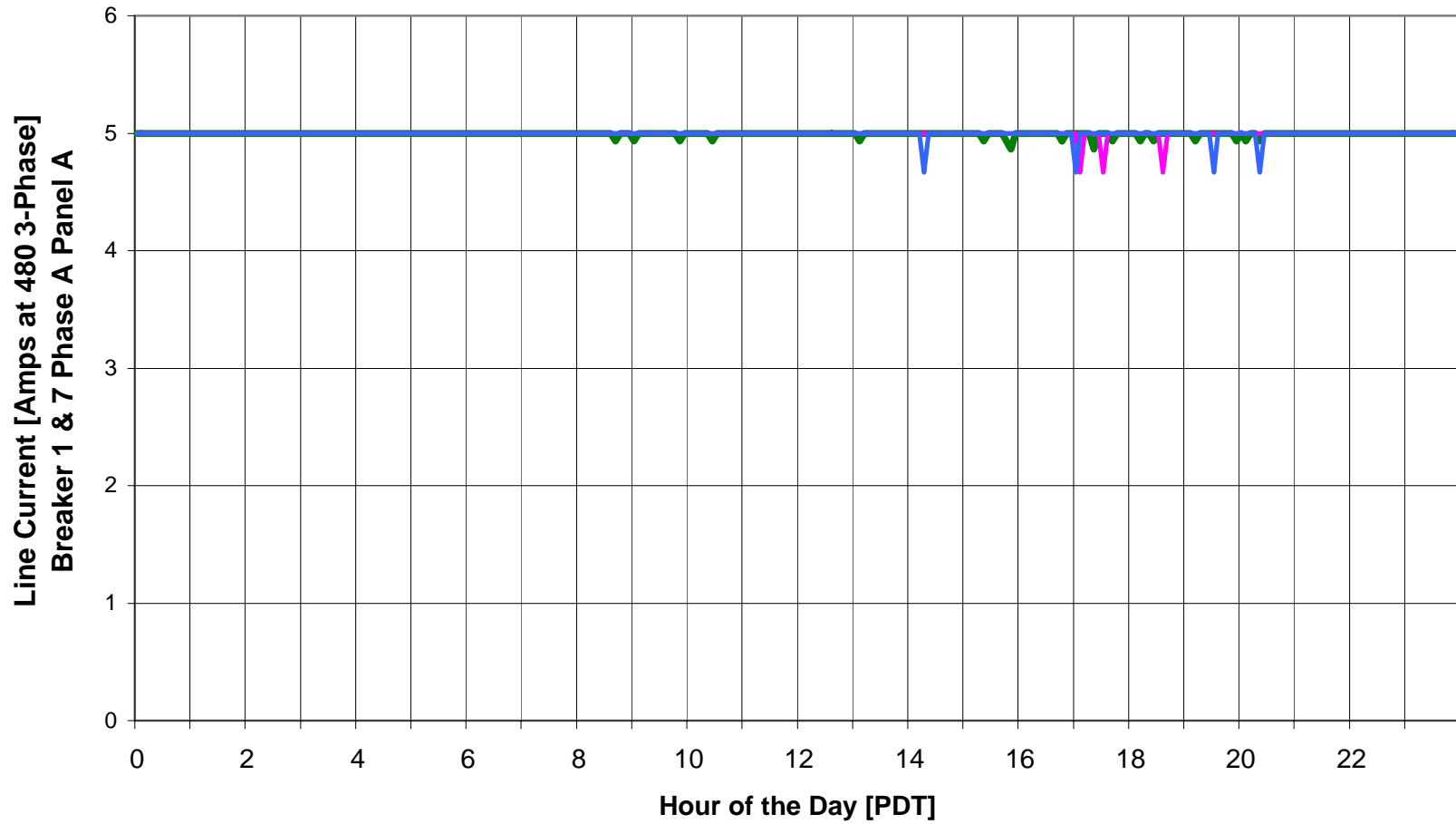


Monday-Friday Saturday Sunday/Holiday

LA County Biscailuz Recovery Center Nov./Dec. 2003
Gym Lights
Average Daily Load Profile

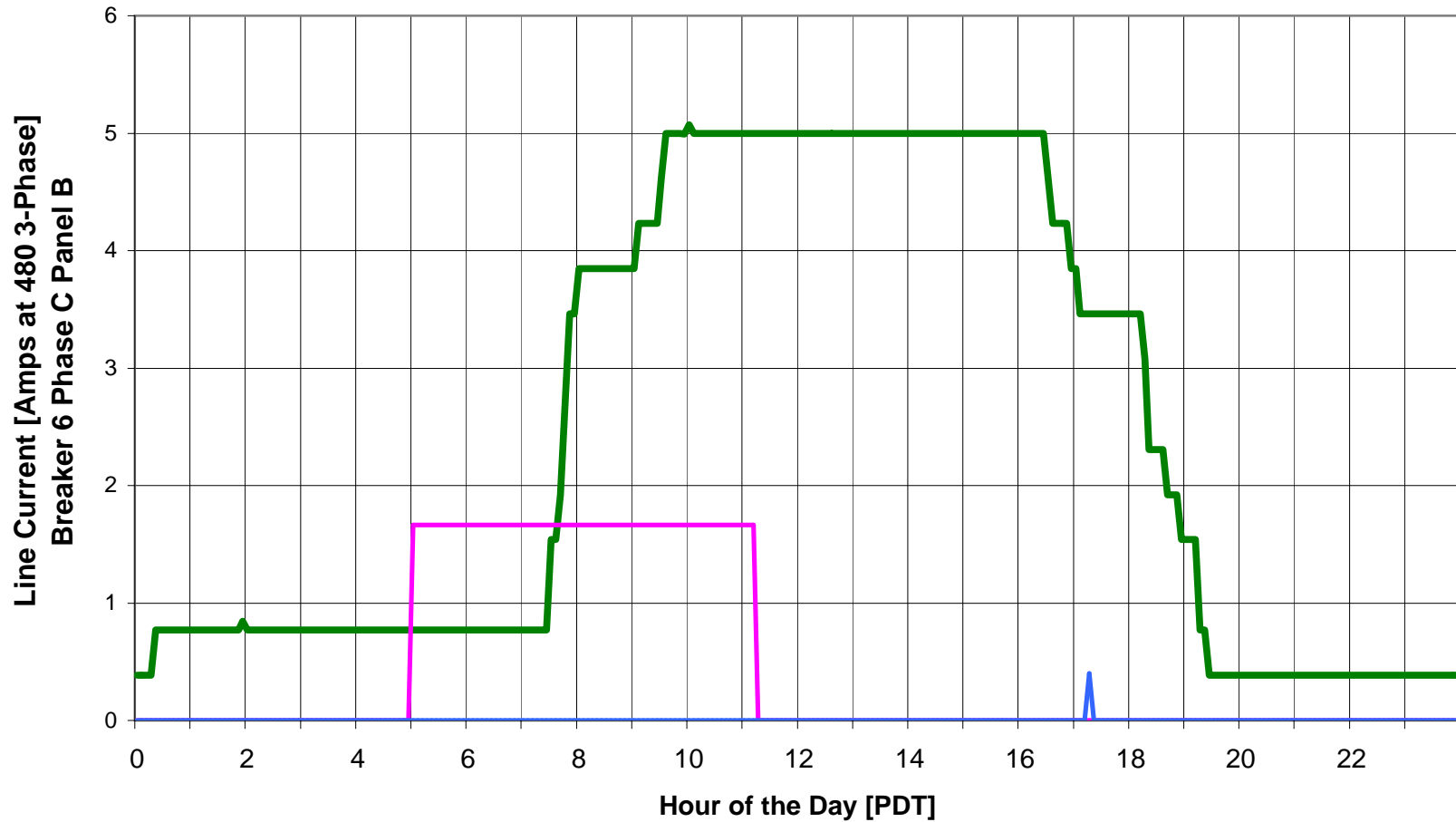


LA County Biscailuz Recovery Center Nov./Dec. 2003
Kitchen Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

LA County Biscailuz Recovery Center Nov./Dec. 2003
Office Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																						
12. Bizcailuz Recovery Center																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
119	Exterior	MV175/1	Jar	1	1 lamp 60W A jelly jar fixture ACTUALLY 175W MH	0	215	1.505	4380	6,592	None	Replace	MV175/1		2	New 2 lamp 13W vandal resistant wall pack	0	215	1.505	6,592	0.000	0
172	Storage Area - NO ACCESS	MH100/1	ESTIMATE - Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser actually 100W MH	0	128	0.256	2250	576	None	Retrofit	MH100/1		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	0	128	0.256	576	0.000	0
																Total HID	0				0.000	0
7	Lobby	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	3	30	0.090	8760	788	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	3	2	0.006	53	0.084	736
11	Classroom	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	3	30	0.090	8760	788	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	3	2	0.006	53	0.084	736
17	Lobby	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
19	Classroom #1	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
23	Lunch Area	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
36	Stairwell	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
39	Women's Rest Room	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
41	Women's Locker Room	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	2	30	0.060	8760	526	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	2	2	0.004	35	0.056	491
51	Hallway	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	3	30	0.090	8760	788	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	3	2	0.006	53	0.084	736

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Exitsting Fixtures											New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
62	Men's Locker Room	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245		
65	Office	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245		
74	Classroom #2	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	1	50	0.050	8760	438	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	5	0.0045	39	0.046	399		
78	Classroom #3	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	2	50	0.100	8760	876	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	2	5	0.009	79	0.091	797		
82	Entry	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	1	50	0.050	8760	438	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	5	0.0045	39	0.046	399		
97	Cafeteria	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	2	50	0.100	8760	876	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	2	5	0.009	79	0.091	797		
102	Hallway	E125/2	Exit	2	2 lamp 25W A green face, exit sign	1	50	0.050	8760	438	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	5	0.0045	39	0.046	399		
190	Hallway	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	2	30	0.060	8760	526	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	2	2	0.004	35	0.056	491		
199	Storage	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245		
204	Office	EITT	Exit	0	Tritium exit sign	2	0	0.000	0	0	None	NO CHANGE	EITT		0	NO CHANGE	0	0	0	0	0.000	0		
209	Men's Rest Room	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	2	30	0.060	8760	526	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	2	2	0.004	35	0.056	491		
																Total Exits	30				0.963	8,432		

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
2	Trailer	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	4	123	0.492	2250	1,107	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	4	102	0.408	918	0.084	189	
6	Lobby	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	2250	2,592	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	8	56	0.448	1,008	0.704	1,584	
8	Hallway	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	3	144	0.432	2250	972	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	351	0.276	621	
9	Hallway	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, 1 ES ballasts, recessed, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
10	Classroom	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	2250	2,592	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	8	62	0.496	1,116	0.656	1,476	
12	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828	
13	Office	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
14	Rear Entry	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, opal diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45	
16	Lobby	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1.296	2250	2,916	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,053	0.828	1,863	
18	Classroom #1	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	144	1.728	2250	3,888	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	12	62	0.744	1,674	0.984	2,214	
20	Office #1	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414	
21	Office #2	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414	
22	Lunch Area	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	14	144	2.016	2250	4,536	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	14	62	0.868	1,953	1.148	2,583	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Existing Fixtures											New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
24	Closet	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	780	112	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.040	31		
25	Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90		
26	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	3	144	0.432	2250	972	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	351	0.276	621		
27	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414		
28	Office	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90		
29	Office (large)	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	702	0.552	1,242		
30	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414		
31	Kitchen	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	702	0.552	1,242		
32	Phone closet	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	3	72	0.216	780	168	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	122	0.060	47		
33	Phone closet	F42EE	Strip	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	780	112	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.040	31		
34	Stairwell	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.184	1,612		
35	Stairwell	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350		
38	Women's Rest Room	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	780	112	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.040	31		

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Exitsting Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
40	Women's Locker Room	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	13	144	1.872	2250	4,212	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	13	56	0.728	1,638	1.144	2,574	
42	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	252	0.176	396	
44	Showers	F42EE	VT Wrap	2	1x4 34W, ES ballast, surface mount, vapor tight, prismatic diffuser	4	72	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.080	180	
45	Showers	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207	
47	LT Norris Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2250	1,944	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	6	56	0.336	756	0.528	1,188	
48	LT Norris Office	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
49	LT Norris Office	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45	
50	Hallway	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	5	144	0.720	2250	1,620	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.26	585	0.460	1,035	
53	Lobby	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	2250	2,592	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	8	56	0.448	1,008	0.704	1,584	
54	Deputy Emenger Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	702	0.552	1,242	
55	Sgt Rivero	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828	
56	Men's Rest Room	F22SS	Wrap	2	1x2, 20W, standard ballast, surface mount, prismatic diffuser	1	56	0.056	2250	126	None	Retrofit	F22ILL-R		2	F17T8 lamps, 1 low watt 2 lamp electronic ballast	1	28	0.028	63	0.028	63	
57	Men's Rest Room	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
58	Men's Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45	
59	Showers	FC22	Drum	1	1 lamp 22W circline drum fixture	1	24	0.024	2250	54	None	NO CHANGE	FC22		1	NO CHANGE	0	24	0.024	54	0.000	0	
60	Men's Locker Room	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	21	144	3.024	2250	6,804	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	21	56	1.176	2,646	1.848	4,158	
61	Men's Locker Room	FU2EE	Troffer	2	2x4 2 lamp 34W, ES ballast, recessed, prismatic diffuser actually 2x2 2 lamp ubend	7	72	0.504	2250	1,134	A/B	Retrofit	F42ILL-R		2	FB32T8 lamps, 2 low watt 1 lamp electronic ballast	7	56	0.392	882	0.112	252	
64	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	7	144	1.008	2250	2,268	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	7	56	0.392	882	0.616	1,386	
66	Kitchen	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
67	Kitchen	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	252	0.176	396	
68	Copier Room	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	252	0.176	396	
71	Basement	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	1	123	0.123	2250	277	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	1	102	0.102	230	0.021	47	
73	Classroom #2	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	18	144	2.592	2250	5,832	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	18	59	1.062	2,390	1.530	3,443	
75	Office - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207	
76	Kitchen	F44ILL	Wrap	4	2x4 4 lamp F32T8, electronic ballasts, surface mount, prismatic diffuser	0	112	0.672	2250	1,512	None	Retrofit	F44ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	0	112	0.672	1,512	0.000	0	
77	Classroom #3	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	18	144	2.592	2250	5,832	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	18	59	1.062	2,390	1.530	3,443	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Existing Fixtures											New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
79	Storage (Cl Rm #3)	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	780	112	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	41	0.092	72		
80	Kitchen	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	33	144	4.752	2250	10,692	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	33	59	1.947	4,381	2.805	6,311		
81	Entry	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	2250	648	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	252	0.176	396		
83	Office	F43ILL	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	1	115	0.115	2250	259	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.063	142		
84	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828		
85	Office	F44EE	Industrial Hood	4	1x4 4 lamp 34W, 2 ES ballasts	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414		
86	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414		
87	Hallway	F44EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90		
88	Rest Room	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207		
89	Locked Area NO ACCESS	F44EE	ESTIMATE - Wrap	4	ESTIMATE - 1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207		
90	kitchen wash area	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	2	59	0.118	266	0.170	383		
91	Clean Station	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	6	59	0.354	797	0.510	1,148		
93	Dish Wash Area	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	4	59	0.236	531	0.340	765		

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
94	Room - NO ACCESS	F44EE	ESTIMATE - Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	4	59	0.236	531	0.340	765	
95	Kitchen	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	6	59	0.354	797	0.510	1,148	
96	Cafeteria	F44ILL	Wrap	4	1x4 4 lamp F32T8, electronic ballasts, surface mount, no diffuser	30	112	3.360	2250	7,560	None	NO CHANGE	F44ILL		2	NO CHANGE	0	112	3.36	7,560	0.000	0	
99	Motor Room	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	1	123	0.123	2250	277	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	1	102	0.102	230	0.021	47	
100	Motor Room	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414	
101	Hallway	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	4	72	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.080	180	
103	Generator Room	F43EE	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	8	115	0.920	2250	2,070	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	936	0.504	1,134	
104	Tool Room	F82EE	Wrap	2	1x8 2 lamp F96 60W ES ballast strip fixture	6	123	0.738	2250	1,661	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	6	102	0.612	1,377	0.126	284	
105	Boiler Room	F82EE	Wrap	2	1x8 2 lamp F96 60W ES ballast strip fixture	5	123	0.615	2250	1,384	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	5	102	0.51	1,148	0.105	236	
106	Boiler Room	F43EE	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	2	115	0.230	2250	518	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.126	284	
107	Boiler Room	F42EE	Wrap	2	1x4, 2 lamp 34W, 2 ES ballasts	4	72	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.080	180	
109	Refrigerator #3	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	6	72	0.432	2250	972	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	702	0.120	270	
110	Lock Up	F44EE	Industrial Hood	4	1x4 4 lamp 34W, 2 ES ballasts	10	144	1.440	2250	3,240	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	10	52	0.52	1,170	0.920	2,070	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
111	Lock Up	F44EE	Industrial Hood	4	1x4 4 lamp 34W, 2 ES ballasts	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414	
113	Refrigerator #5 - NO ACCESS	F42EE	ESTIMATE - Industrial Hood	2	ESTIMATE - 1x4, 2 lamp 34W, 2 ES ballasts	3	72	0.216	2250	486	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	351	0.060	135	
114	Rest Room	F42EE	Wrap	2	1x4, 2 lamp 34W, 2 ES ballasts	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
115	Generator Room	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	5	72	0.360	2250	810	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.26	585	0.100	225	
116	Refrigerator Hall	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	7	144	1.008	2250	2,268	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	819	0.644	1,449	
118	Outdoor Lunch Area	F44ILL	Wrap	4	1x4 4 lamp F32T8, electronic ballasts, surface mount, no diffuser	14	112	1.568	2250	3,528	None	NO CHANGE	F44ILL		2	NO CHANGE	0	112	1.568	3,528	0.000	0	
120	Ammunition Rm	F44EE	Wrap	4	1x4 2 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	4380	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	911	0.368	1,612	
120	Ammunition Rm	F43EE	Troffer	3	1x4, 3 lamp 34W, 2 ES ballasts recessed, prismatic diffuser	8	115	0.920	2250	2,070	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	936	0.504	1,134	
126	Men's Locker Room	F42ILL	Wrap	2	1x4 2 lamp F32T8, electronic ballasts, surface mount, prismatic diffuser	4	59	0.236	2250	531	None	NO CHANGE	F42ILL		2	NO CHANGE	0	59	0.236	531	0.000	0	
128	Classroom	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	30	72	2.160	2250	4,860	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	30	52	1.56	3,510	0.600	1,350	
129	Office	F42EE	Troffer	2	1x4 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
130	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207	
133	Kitchen	F43EE	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	8	115	0.920	2250	2,070	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	936	0.504	1,134	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Exitsting Fixtures											New Fixtures									Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
134	Storage - NO ACCESS	F42EE	ESTIMATE - Industrial Hood	2	ESTIMATE - 1x4 2 lamp 34W, ES ballast	7	72	0.504	2250	1,134	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	819	0.140	315	
137	Office (armory hall)	F43EE	Troffer	3	1x4, 3 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	115	0.460	2250	1,035	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.252	567	
138	Armory	F43EE	Troffer	3	1x4, 3 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	115	1.035	2250	2,329	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,053	0.567	1,276	
139	Armory	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828	
140	Armory	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	3	72	0.216	2250	486	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	351	0.060	135	
143	Hallway	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828	
144	Office	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828	
147	Entry	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	702	0.552	1,242	
150	Booth	F42EE	Troffer	2	1x4 2 lamp 34W, ES ballast, recessed, opal diffuser	4	72	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.080	180	
151	Range	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414	
152	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, "egg crate"	1	144	0.144	2250	324	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	1	52	0.052	117	0.092	207	
153	Store	F32SS	Troffer	6	1x3 6 lamp 30W, 3 standard ballast, recessed, prismatic diffuser	2	243	0.486	2250	1,094	None	Retrofit	F33ILL		3	F25T8 lamps, 1 standard 3 lamp electronic ballast	2	70	0.14	315	0.346	779	
154	Store	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, paracube diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
155	Store	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, opal diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207	
156	Rest Room	F41EE	Wrap	1	1x4 1 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	43	0.043	2250	97	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	1	28	0.028	63	0.015	34	
161	Shop area	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	20	144	2.880	2250	6,480	A/B	Retrofit	F44ILL		4	F32T8 lamps, 2 standard 2 lamp electronic ballasts	20	112	2.08	4,680	0.800	1,800	
161	Shop area	F42EE	Troffer	2	1x4, 2 lamp 34W, 1 ES ballasts, recessed, prismatic diffuser	1	72	0.072	2250	162	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 2 lamp electronic ballasts	1	59	0.059	133	0.013	29	
162	Office	F42ILL	Troffer	4	2x4 4 lamp F32T8, electronic ballasts, recessed, prismatic diffuser	2	112	0.224	2250	504	A/B	NO CHANGE	F42ILL		4	NO CHANGE	0	112	0.224	504	0.000	0	
163	Storage	F42EE	Troffer	2	1x4 2 lamp 34W, ES ballast, recessed, prismatic diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45	
164	Kitchen	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90	
165	Tool Area	FU2ILL	Troffer	2	2x2 2 lamp FB32T8, electronic ballasts, recessed, prismatic diffuser	2	59	0.118	2250	266	None	NO CHANGE	FU2ILL		4	NO CHANGE	0	59	0.118	266	0.000	0	
166	Storage	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	230	0.042	95	
167	Exterior hallway	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207	
168	Wood storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	6	144	0.864	2250	1,944	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	702	0.552	1,242	
169	Wood storage	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45	
170	Paint Room	F44EL	Troffer	4	1x4 4 lamp F40 34W, T8 electronic ballasts, recessed, prismatic diffuser	4	120	0.480	2250	1,080	None	Relamp	F44ILL		4	F32T8 lamps	4	112	0.448	1,008	0.032	72	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Exitsting Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
171	Paint Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	2250	2,592	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	8	102	0.816	1,836	0.336	756
175	Laundry	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	230	0.042	95
177	Plumber Office	F44ILL	Wrap	4	2x4 4 lamp F32T8, electronic ballast, surface mount, prismatic diffuser	0	112	0.112	2250	252	None	Retrofit	F44ILL		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	0	112	0.112	252	0.000	0
178	Office	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	0	144	0.000	2250	0	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	0	52	0	0	0.000	0
180	Carpet Shop	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	2	123	0.246	2250	554	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	2	102	0.204	459	0.042	95
181	Carpet Shop	F44EE	Strip	4	1x8, 4 lamp 34W, 2 ES ballasts	1	144	0.144	2250	324	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	230	0.042	95
182	Storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414
183	Storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828
184	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414
185	Carpet Open Area	F42ILL	Wrap	2	1x4 2 lamp F32T8, electronic ballasts, surface mount, prismatic diffuser	2	59	0.118	2250	266	None	NO CHANGE	F42ILL		2	NO CHANGE	0	59	0.118	266	0.000	0
186	Carpet Open Area	F44EE	Wrap	4	1x4, 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	10	144	1.440	2250	3,240	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	10	102	1.02	2,295	0.420	945
188	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	2250	648	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.184	414
189	Hallway	F44EE	Troffer	4	4x4, 4 lamp 34W, 2 ES ballasts, recessed, no diffuser	1	144	0.144	2250	324	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	230	0.042	95

Contractor As-Built Savings
12. Bizcailuz Recovery Center

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
191	Gym	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	30	144	4.320	2250	9,720	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	30	52	1.56	3,510	2.760	6,210
193	Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	234	0.040	90
195	Storage	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	12	72	0.864	2250	1,944	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	12	52	0.624	1,404	0.240	540
197	Storage	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45
198	Storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	2250	324	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.092	207
200	Exercise Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	30	144	4.320	2250	9,720	A/B	Retrofit	F44ILL		4	F32T8 lamps, 2 standard 2 lamp electronic ballasts	30	104	3.12	7,020	1.200	2,700
202	Exercise Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	3	72	0.216	2250	486	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	351	0.060	135
203	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	2250	1,296	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	468	0.368	828
205	Women Rest Room	FC32	Drum	2	2 lamp 100W drum fixture, opal diffuser actually 22W & 32W compact circline	0	54	0.000	2250	0	None	Retrofit	CFQ28/1		2	27W compact fluorescent spring lamp	0	54	0.108	243	-0.108	-243
206	Women Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	2250	162	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	117	0.020	45
207	Men's Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	9	72	0.648	2250	1,458	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,053	0.180	405
213	Gym	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	8	144	1.152	2250	2,592	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	8	102	0.816	1,836	0.336	756
																Total T12-T8	659				42.076	96,513

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
3	Trailer exterior	I60/1	Jar	1	1 lamp 60W A jelly jar fixture	1	60	0.060	4380	263	None	Replace	CFQ18/1-L		1	New vandal resistant 18W PL wall pack	1	20	0.02	88	0.040	175	
43	Rear Stairwell	I60/1	Jar	1	1 lamp 60W Jelly Jar w/wire cage	2	60	0.120	8760	1,051	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	333	0.082	718	
46	Showers	I75/1	Can	1	1 lamp 75W A, down light can, opal diffuser	2	75	0.150	2250	338	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	86	0.112	252	
52	Kitchen Counter	CFQ26/1-L	Can	1	1 lamp 26W compact fluorescent	2	28	0.056	2250	126	None	NO CHANGE	CFQ26/1-L		1	NO CHANGE	0	28	0.056	126	0.000	0	
63	Closet (hall)	I60/1	Keyless	1	1 lamp 60W A keyless	1	60	0.060	780	47	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
70	Basement	I200/1	Keyless	1	1 lamp 200W PS Keyless	8	200	1.600	2250	3,600	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	8	42	0.336	756	1.264	2,844	
91.1		I60/1	Jar	1	1 lamp 60W A jelly jar fixture	1	60	0.060	780	47	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
92	Storage	I60/1	Jar	1	1 lamp 60W A jelly jar fixture	1	60	0.060	780	47	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
108	Electrical Room - NO ACCESS	I150/1	ESTIMATE - Wrap	1	ESTIMATE - 1x4, 2 lamp 34W, 2 ES ballasts actually 150W keyless	1	150	0.150	2250	338	None	Retrofit	CFT40/1		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	42	0.042	95	0.108	243	
112	Stairwell	I150/1	Keyless	1	1 lamp 150W keyless	2	150	0.300	2250	675	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	2	42	0.084	189	0.216	486	
121	Exterior (under canopy)	I60/2	Square	2	2 lamp 60W A recessed square, opal diffuser	2	120	0.240	4380	1,051	None	Retrofit	CFQ18/1-L		2	19W compact fluorescent spring lamp	2	38	0.076	333	0.164	718	
122	Exterior	CFQ13/1-L	Jar	1	1 lamp 60W A jelly jar fixture actually 13W PL wall pack	0	13	0.013	4380	57	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	0	13	0.013	57	0.000	0	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																							
12. Bizcailuz Recovery Center																							
Existing Fixtures												New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
123	Women's Rest Room	I60/2	Drum	2	2 lamp 60W A drum fixture	2	120	0.240	2250	540	None	Retrofit	CFQ18/1-L		2	19W compact fluorescent spring lamp	2	38	0.076	171	0.164	369	
124	Closet	I60/1	Keyless	1	1 lamp 60W A keyless	1	60	0.060	780	47	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
125	Mechanical	I60/1	Dome	1	1 lamp 60W A dome fixture	2	60	0.120	780	94	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	2	19	0.038	30	0.082	64	
127	Mechanical	I150/1	Dome	1	1 lamp 150W A dome fixture	1	150	0.150	780	117	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	1	42	0.042	33	0.108	84	
131	Target Area	I150/1	Jar	1	1 lamp 150W Jelly Jar fixture	11	150	1.650	1000	1,650	None	Replace	CFQ13/2		2	New 2 lamp 13W vandal resistant wall pack	11	30	0.33	330	1.320	1,320	
132	Target Area	I100/1	Keyless	1	1 lamp 100W A keyless	4	100	0.400	1000	400	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	4	27	0.108	108	0.292	292	
135	PR3/M	I150/1	Keyless	1	1 lamp 150W keyless	1	150	0.150	2250	338	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	1	19	0.019	43	0.131	295	
141	Armory	CFQ13/1-L	Dome	1	1 lamp 100W A dome fixture actually 13W PL wall pack	0	13	0.026	780	20	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	0	13	0.026	20	0.000	0	
142	Hallway	CFQ13/1-L	Dome	1	1 lamp 100W A dome fixture actually 13W PL wall pack	0	13	0.026	780	20	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	0	13	0.026	20	0.000	0	
145	Storage	I100/1	Square	1	1 lamp 100W recessed square	2	100	0.200	2250	450	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	2	27	0.054	122	0.146	329	
148	Men's Rest Room	I200/2	Drum	2	2 lamp 100W drum fixture, opal diffuser	2	200	0.400	2250	900	None	Retrofit	CF28/1-SCRW		2	27W compact fluorescent spring lamp	2	54	0.108	243	0.292	657	
149	Range	I60/1	Track	1	1 lamp 60W A track head	22	60	1.320	2250	2,970	Dimmer	NO CHANGE	I60/1		1	NO CHANGE	0	60	1.32	2,970	0.000	0	
157	Rest Room	I200/2	Drum	2	2 lamp 100W drum fixture, opal diffuser	2	200	0.400	2250	900	None	Retrofit	CF28/1-SCRW		2	27W compact fluorescent spring lamp	2	54	0.108	243	0.292	657	

Contractor As-Built Savings
12. Bizcailuz Recovery Center

Contractor As-Built Savings																						
12. Bizcailuz Recovery Center																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
158	Exterior	I150/1	Jar	1	1 lamp 150W Jelly Jar fixture	3	150	0.450	1000	450	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	3	30	0.09	90	0.360	360
159	Exterior (under canopy)	I100/1	Square	1	1 lamp 100W recessed square	10	100	1.000	2250	2,250	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	10	27	0.27	608	0.730	1,643
174	Closets (3)	I100/1	Keyless	1	1 lamp 100W A keyless	2	100	0.200	1000	200	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	2	27	0.054	54	0.146	146
176	Plumber Shop	I200/1	Keyless	1	1 lamp 200W keyless	5	200	1.000	2250	2,250	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	5	42	0.21	473	0.790	1,778
179	Carpet Shop Rest Room	CFQ15/1	Keyless	1	1 lamp 15W compact fluorescent	3	15	0.045	2250	101	None	NO CHANGE	CFQ15/1		1	NO CHANGE	0	15	0.045	101	0.000	0
192	Gym Hallway	I60/1	Square	1	1 lamp 60W recessed square	2	60	0.120	2250	270	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	2	19	0.038	86	0.082	185
194	Storage	I100/1	Keyless	1	1 lamp 100A keyless	1	100	0.100	1000	100	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	1	27	0.027	27	0.073	73
196	Storage	I200/1	Jar	1	1 lamp 200W Jelly Jar fixture	4	200	0.800	2250	1,800	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	4	30	0.12	270	0.680	1,530
201	Exercise Room	I100/1	Jar	1	1 lamp 100W Jelly Jar fixture	3	100	0.300	1000	300	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	3	30	0.09	90	0.210	210
208	Men's Rest Room	I60/1	Square	1	1 lamp 60W recessed square	2	60	0.120	2250	270	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	2	19	0.038	86	0.082	185
210	Mechanical	I200/1	Keyless	1	1 lamp 200W keyless	2	200	0.400	2250	900	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	2	42	0.084	189	0.316	711
211	Exterior	I60/1	Jar	1	1 lamp 60W Jelly Jar fixture	3	60	1.800	1000	1,800	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	3	30	0.09	90	1.710	1,710
213	Gym RR	I60/1	Keyless	1	1 lamp 60W A19 keyless	1	60	0.060	2250	135	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	1	19	0.019	43	0.041	92

Contractor As-Built Savings
 12. Bizcailuz Recovery Center

Contractor As-Built Savings																								
12. Bizcailuz Recovery Center																								
Existing Fixtures												New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
214	Exterior	I150/1	Knuckle Flood	1	1 lamp 150W PAR 38 flood lamp	8	150	1.200	4380	5,256	None	Retrofit	I90/1		1	90W Halogen PAR 38 flood lamp	8	90	0.72	3,154	0.480	2,102		
																Total INCAN	95				10.677	20,355		
Total						868		107.865		252,600			Total						784		54	127,300	53.716	125,300

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
119	Exterior	MV175/1	Jar	1	1 lamp 60W A jelly jar fixture ACTUALLY 175W MH	0	215	0.000	4380	0	None	Replace	MV175/1		2	New 2 lamp 13W vandal resistant wall pack	0	215	0.000	0	0.000	0
172	Storage Area - NO ACCESS	MH100/1	ESTIMATE - Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser actually 100W MH	0	128	0.000	2250	0	None	Retrofit	MH100/1		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	0	128	0.000	0	0.000	0
																Total HID	0				0.000	0
7	Lobby	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	3	30	0.090	8760	788	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	3	2	0.006	53	0.084	736
11	Classroom	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	3	30	0.090	8760	788	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	3	2	0.006	53	0.084	736
17	Lobby	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
19	Classroom #1	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
23	Lunch Area	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
36	Stairwell	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
39	Women's Rest Room	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245
41	Women's Locker Room	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	2	30	0.060	8760	526	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	2	2	0.004	35	0.056	491
51	Hallway	EI15/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	3	30	0.090	8760	788	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	3	2	0.006	53	0.084	736

Aloha Systems Measured Savings
12. Biscailluz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
62	Men's Locker Room	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245	
65	Office	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245	
74	Classroom #2	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	1	50	0.050	8760	438	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	5	0.0045	39	0.046	399	
78	Classroom #3	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	2	50	0.100	8760	876	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	2	5	0.009	79	0.091	797	
82	Entry	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	1	50	0.050	8760	438	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	5	0.0045	39	0.046	399	
97	Cafeteria	E125/2	Exit	2	2 lamp 25W A green face, recessed, exit sign	2	50	0.100	8760	876	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	2	5	0.009	79	0.091	797	
102	Hallway	E125/2	Exit	2	2 lamp 25W A green face, exit sign	1	50	0.050	8760	438	None	Retrofit	EICC		1	Cold Cathode Exit Sign Retrofit Kit	1	5	0.0045	39	0.046	399	
190	Hallway	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	2	30	0.060	8760	526	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	2	2	0.004	35	0.056	491	
199	Storage	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	1	30	0.030	8760	263	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	1	2	0.002	18	0.028	245	
204	Office	EITT	Exit	0	Tritium exit sign	0	0	0.000	8760	0	None	NO CHANGE	EITT		0	NO CHANGE	0	0	0	0	0.000	0	
209	Men's Rest Room	E115/2	Exit	2	2 lamp 15W T6 1/2 incandescent, green face, exit sign	2	30	0.060	8760	526	None	Replace	ELED2/1		1	New Green LED exit sign with battery backup	2	2	0.004	35	0.056	491	
																Total Exits	30				0.963	8,432	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
2	Trailer	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	4	123	0.492	3028	1,490	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	4	102	0.408	1,235	0.084	254	
6	Lobby	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	3028	3,488	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	8	56	0.448	1,357	0.704	2,132	
8	Hallway	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	3	144	0.432	3028	1,308	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	472	0.276	836	
9	Hallway	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, 1 ES ballasts, recessed, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121	
10	Classroom	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	3028	3,488	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	8	62	0.496	1,502	0.656	1,986	
12	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	
13	Office	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121	
14	Rear Entry	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, opal diffuser	1	72	0.072	3028	218	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.020	61	
16	Lobby	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	144	1.296	3028	3,924	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,417	0.828	2,507	
18	Classroom #1	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	12	144	1.728	3028	5,232	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	12	62	0.744	2,253	0.984	2,980	
20	Office #1	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557	
21	Office #2	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557	
22	Lunch Area	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	14	144	2.016	3028	6,104	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	14	62	0.868	2,628	1.148	3,476	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures											New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
24	Closet	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	780	112	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.040	31		
25	Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121		
26	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	3	144	0.432	3028	1,308	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	472	0.276	836		
27	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557		
28	Office	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121		
29	Office (large)	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	3028	2,616	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	945	0.552	1,671		
30	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557		
31	Kitchen	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	8760	7,569	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	2,733	0.552	4,836		
32	Phone closet	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	3	72	0.216	780	168	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	122	0.060	47		
33	Phone closet	F42EE	Strip	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	780	112	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.040	31		
34	Stairwell	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.184	1,612		
35	Stairwell	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350		
38	Women's Rest Room	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121		

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
40	Women's Locker Room	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	13	144	1.872	8599	16,097	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	13	56	0.728	6,260	1.144	9,837	
42	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	339	0.176	533	
44	Showers	F42EE	VT Wrap	2	1x4 34W, ES ballast, surface mount, vapor tight, prismatic diffuser	4	72	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.080	242	
45	Showers	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279	
47	LT Norris Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	3028	2,616	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	6	56	0.336	1,017	0.528	1,599	
48	LT Norris Office	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121	
49	LT Norris Office	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	3028	218	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.020	61	
50	Hallway	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	5	144	0.720	3028	2,180	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.26	787	0.460	1,393	
53	Lobby	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	3028	3,488	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	8	56	0.448	1,357	0.704	2,132	
54	Deputy Emerger Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	3028	2,616	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	945	0.552	1,671	
55	Sgt Rivero	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	
56	Men's Rest Room	F22SS	Wrap	2	1x2, 20W, standard ballast, surface mount, prismatic diffuser	1	56	0.056	3028	170	None	Retrofit	F22ILL-R		2	F17T8 lamps, 1 low watt 2 lamp electronic ballast	1	28	0.028	85	0.028	85	
57	Men's Rest Room	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
58	Men's Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	3028	218	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.020	61	
59	Showers	FC22	Drum	1	1 lamp 22W circline drum fixture	0	24	0.000	3028	0	None	NO CHANGE	FC22		1	NO CHANGE	0	24	0.000	0	0.000	0	
60	Men's Locker Room	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	21	144	3.024	8599	26,003	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	21	56	1.176	10,112	1.848	15,891	
61	Men's Locker Room	FU2EE	Troffer	2	2x4 2 lamp 34W, ES ballast, recessed, prismatic diffuser actually 2x2 2 lamp ubend	7	72	0.504	8599	4,334	A/B	Retrofit	F42ILL-R		2	FB32T8 lamps, 2 low watt 1 lamp electronic ballast	7	56	0.392	3,371	0.112	963	
64	Office	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	7	144	1.008	3028	3,052	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	7	56	0.392	1,187	0.616	1,865	
66	Kitchen	FU2EE	Troffer	2	2x2 2 lamp 34W Ubend, ES ballast, recessed, prismatic diffuser	2	72	0.144	8760	1,261	None	Retrofit	F42ILL-R		2	FB32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	911	0.040	350	
67	Kitchen	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	8760	2,523	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	981	0.176	1,542	
68	Copier Room	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	339	0.176	533	
71	Basement	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	1	123	0.123	780	96	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	1	102	0.102	80	0.021	16	
73	Classroom #2	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	18	144	2.592	8760	22,706	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	18	59	1.062	9,303	1.530	13,403	
75	Office - NO ACCESS	F44EE	ESTIMATE - Troffer	4	ESTIMATE - 2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279	
76	Kitchen	F44ILL	Wrap	4	2x4 4 lamp F32T8, electronic ballasts, surface mount, prismatic diffuser	0	112	0.000	8760	0	None	Retrofit	F44ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	0	112	0	0	0.000	0	
77	Classroom #3	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	18	144	2.592	8760	22,706	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	18	59	1.062	9,303	1.530	13,403	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
79	Storage (Cl Rm #3)	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	780	112	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	41	0.092	72
80	Kitchen	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	33	144	4.752	8760	41,628	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	33	59	1.947	17,056	2.805	24,572
81	Entry	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	3028	872	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballast	2	56	0.112	339	0.176	533
83	Office	F43ILL	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	1	115	0.115	3028	348	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.063	191
84	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114
85	Office	F44EE	Industrial Hood	4	1x4 4 lamp 34W, 2 ES ballasts	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557
86	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557
87	Hallway	F44EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121
88	Rest Room	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279
89	Locked Area NO ACCESS	F44EE	ESTIMATE - Wrap	4	ESTIMATE - 1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	1	144	0.144	780	112	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	41	0.092	72
90	kitchen wash area	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	2	144	0.288	8760	2,523	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	2	59	0.118	1,034	0.170	1,489
91	Clean Station	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	6	144	0.864	8760	7,569	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	6	59	0.354	3,101	0.510	4,468
93	Dish Wash Area	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	4	144	0.576	8760	5,046	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	4	59	0.236	2,067	0.340	2,978

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures											New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
94	Room - NO ACCESS	F44EE	ESTIMATE - Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	4	144	0.576	780	449	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	4	59	0.236	184	0.340	265		
95	Kitchen	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	6	144	0.864	8760	7,569	None	Retrofit	F42ILL		2	F32T8 lamps, 1 standard 2 lamp electronic ballast	6	59	0.354	3,101	0.510	4,468		
96	Cafeteria	F44ILL	Wrap	4	1x4 4 lamp F32T8, electronic ballasts, surface mount, no diffuser	0	112	0.000	3028	0	None	NO CHANGE	F44ILL		2	NO CHANGE	0	112	0	0	0.000	0		
99	Motor Room	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	1	123	0.123	780	96	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	1	102	0.102	80	0.021	16		
100	Motor Room	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	2	144	0.288	780	225	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.184	144		
101	Hallway	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	4	72	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.080	242		
103	Generator Room	F43EE	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	8	115	0.920	780	718	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	324	0.504	393		
104	Tool Room	F82EE	Wrap	2	1x8 2 lamp F96 60W ES ballast strip fixture	6	123	0.738	780	576	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	6	102	0.612	477	0.126	98		
105	Boiler Room	F82EE	Wrap	2	1x8 2 lamp F96 60W ES ballast strip fixture	5	123	0.615	780	480	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	5	102	0.51	398	0.105	82		
106	Boiler Room	F43EE	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	2	115	0.230	780	179	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.126	98		
107	Boiler Room	F42EE	Wrap	2	1x4, 2 lamp 34W, 2 ES ballasts	4	72	0.288	780	225	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	162	0.080	62		
109	Refrigerator #3	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	6	72	0.432	3028	1,308	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	945	0.120	363		
110	Lock Up	F44EE	Industrial Hood	4	1x4 4 lamp 34W, 2 ES ballasts	10	144	1.440	3028	4,360	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	10	52	0.52	1,575	0.920	2,786		

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
111	Lock Up	F44EE	Industrial Hood	4	1x4 4 lamp 34W, 2 ES ballasts	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557	
113	Refrigerator #5 - NO ACCESS	F42EE	ESTIMATE - Industrial Hood	2	ESTIMATE - 1x4, 2 lamp 34W, 2 ES ballasts	3	72	0.216	3028	654	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	472	0.060	182	
114	Rest Room	F42EE	Wrap	2	1x4, 2 lamp 34W, 2 ES ballasts	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121	
115	Generator Room	F42EE	Industrial Hood	2	1x4, 2 lamp 34W, 2 ES ballasts	5	72	0.360	780	281	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.26	203	0.100	78	
116	Refrigerator Hall	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, opal diffuser	7	144	1.008	3028	3,052	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	1,102	0.644	1,950	
118	Outdoor Lunch Area	F44ILL	Wrap	4	1x4 4 lamp F32T8, electronic ballasts, surface mount, no diffuser	0	112	0.000	2250	0	None	NO CHANGE	F44ILL		2	NO CHANGE	0	112	0	0	0.000	0	
120	Ammunition Rm	F44EE	Wrap	4	1x4 2 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	4380	2,523	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	911	0.368	1,612	
120	Ammunition Rm	F43EE	Troffer	3	1x4, 3 lamp 34W, 2 ES ballasts recessed, prismatic diffuser	8	115	0.920	4380	4,030	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	1,822	0.504	2,208	
126	Men's Locker Room	F42ILL	Wrap	2	1x4 2 lamp F32T8, electronic ballasts, surface mount, prismatic diffuser	0	59	0.000	8599	0	None	NO CHANGE	F42ILL		2	NO CHANGE	0	59	0	0	0.000	0	
128	Classroom	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	30	72	2.160	3028	6,540	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	30	52	1.56	4,724	0.600	1,817	
129	Office	F42EE	Troffer	2	1x4 2 lamp 34W, ES ballast, recessed, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121	
130	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279	
133	Kitchen	F43EE	Industrial Hood	3	1x4, 3 lamp 34W, 2 ES ballasts	8	115	0.920	8760	8,059	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	8	52	0.416	3,644	0.504	4,415	

Aloha Systems Measured Savings
12. Biscailluz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
134	Storage - NO ACCESS	F42EE	ESTIMATE - Industrial Hood	2	ESTIMATE - 1x4 2 lamp 34W, ES ballast	7	72	0.504	3028	1,526	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	1,102	0.140	424	
137	Office (armory hall)	F43EE	Troffer	3	1x4, 3 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	115	0.460	3028	1,393	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.252	763	
138	Armory	F43EE	Troffer	3	1x4, 3 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	9	115	1.035	3028	3,134	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,417	0.567	1,717	
139	Armory	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	
140	Armory	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	3	72	0.216	3028	654	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	472	0.060	182	
143	Hallway	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	
144	Office	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	
147	Entry	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	6	144	0.864	3028	2,616	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	945	0.552	1,671	
150	Booth	F42EE	Troffer	2	1x4 2 lamp 34W, ES ballast, recessed, opal diffuser	4	72	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.080	242	
151	Range	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557	
152	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, "egg crate"	1	144	0.144	3028	436	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 standard 1 lamp electronic ballast	1	52	0.052	157	0.092	279	
153	Store	F32SS	Troffer	6	1x3 6 lamp 30W, 3 standard ballast, recessed, prismatic diffuser	2	243	0.486	3028	1,472	None	Retrofit	F33ILL		3	F25T8 lamps, 1 standard 3 lamp electronic ballast	2	70	0.14	424	0.346	1,048	
154	Store	F44EE	Troffer	4	1x4 4 lamp 34W, 2 ES ballasts, recessed, paracube diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures											New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
155	Store	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, recessed, opal diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279		
156	Rest Room	F41EE	Wrap	1	1x4 1 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	43	0.043	3028	130	None	Retrofit	F41ILL-R		1	F32T8 lamp, 1 low watt 1 lamp electronic ballast	1	28	0.028	85	0.015	45		
161	Shop area	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	20	144	2.880	3028	8,721	A/B	Retrofit	F44ILL		4	F32T8 lamps, 2 standard 2 lamp electronic ballasts	20	112	2.24	6,783	0.640	1,938		
161	Shop area	F42EE	Troffer	2	1x4, 2 lamp 34W, 1 ES ballasts, recessed, prismatic diffuser	1	72	0.072	3028	218	A/B	Retrofit	F42ILL		2	F32T8 lamps, 2 standard 2 lamp electronic ballasts	1	59	0.059	179	0.013	39		
162	Office	F42ILL	Troffer	4	2x4 4 lamp F32T8, electronic ballasts, recessed, prismatic diffuser	0	112	0.000	3028	0	A/B	NO CHANGE	F42ILL		4	NO CHANGE	0	112	0	0	0.000	0		
163	Storage	F42EE	Troffer	2	1x4 2 lamp 34W, ES ballast, recessed, prismatic diffuser	1	72	0.072	3028	218	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.020	61		
164	Kitchen	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121		
165	Tool Area	FU2ILL	Troffer	2	2x2 2 lamp FB32T8, electronic ballasts, recessed, prismatic diffuser	0	59	0.000	3028	0	None	NO CHANGE	FU2ILL		4	NO CHANGE	0	59	0	0	0.000	0		
166	Storage	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	1	144	0.144	3028	436	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	309	0.042	127		
167	Exterior hallway	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.092	279		
168	Wood storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	6	144	0.864	3028	2,616	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	6	52	0.312	945	0.552	1,671		
169	Wood storage	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	3028	218	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.020	61		
170	Paint Room	F44EL	Troffer	4	1x4 4 lamp F40 34W, T8 electronic ballasts, recessed, prismatic diffuser	4	120	0.480	3028	1,453	None	Relamp	F44ILL		4	F32T8 lamps	4	112	0.448	1,357	0.032	97		

Aloha Systems Measured Savings
12. Biscailluz Recovery Center

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
171	Paint Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	8	144	1.152	3028	3,488	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	8	102	0.816	2,471	0.336	1,017
175	Laundry	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, recessed, prismatic diffuser	1	144	0.144	3028	436	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	309	0.042	127
177	Plumber Office	F44ILL	Wrap	4	2x4 4 lamp F32T8, electronic ballast, surface mount, prismatic diffuser	0	112	0.000	3028	0	None	Retrofit	F44ILL		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	0	112	0	0	0.000	0
178	Office	F44EE	Wrap	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	0	144	0.000	3028	0	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	0	52	0	0	0.000	0
180	Carpet Shop	F82EE	Strip	2	1x8 2 lamp F96 60W ES ballast strip fixture	2	123	0.246	3028	745	None	Retrofit	F44ILL-R		4	F32T8 lamps 1 low watt 4 lamp electronic ballast, conversion kit	2	102	0.204	618	0.042	127
181	Carpet Shop	F44EE	Strip	4	1x8, 4 lamp 34W, 2 ES ballasts	1	144	0.144	3028	436	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	309	0.042	127
182	Storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	780	225	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	81	0.184	144
183	Storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	780	449	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	162	0.368	287
184	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557
185	Carpet Open Area	F42ILL	Wrap	2	1x4 2 lamp F32T8, electronic ballasts, surface mount, prismatic diffuser	0	59	0.000	3028	0	None	NO CHANGE	F42ILL		2	NO CHANGE	0	59	0	0	0.000	0
186	Carpet Open Area	F44EE	Wrap	4	1x4, 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	10	144	1.440	3028	4,360	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	10	102	1.02	3,089	0.420	1,272
188	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	2	144	0.288	3028	872	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.184	557
189	Hallway	F44EE	Troffer	4	4x4, 4 lamp 34W, 2 ES ballasts, recessed, no diffuser	1	144	0.144	3028	436	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballasts	1	102	0.102	309	0.042	127

Aloha Systems Measured Savings
12. Biscailluz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
191	Gym	F44EE	Troffer	4	2x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	30	144	4.320	533	2,303	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	30	52	1.56	831	2.760	1,471	
193	Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	2	72	0.144	3028	436	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	315	0.040	121	
195	Storage	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	12	72	0.864	780	674	A/B	Retrofit	F42ILL-R		2	F32T8 lamps, 2 low watt 1 lamp electronic ballasts	12	52	0.624	487	0.240	187	
197	Storage	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	780	56	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	41	0.020	16	
198	Storage	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	1	144	0.144	780	112	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	41	0.092	72	
200	Exercise Room	F44EE	Troffer	4	2x4, 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	30	144	4.320	3028	13,081	A/B	Retrofit	F44ILL		4	F32T8 lamps, 2 standard 2 lamp electronic ballasts	30	104	3.12	9,447	1.200	3,634	
202	Exercise Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	3	72	0.216	3028	654	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	472	0.060	182	
203	Office	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	4	144	0.576	3028	1,744	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	4	52	0.208	630	0.368	1,114	
205	Women Rest Room	FC32	Drum	2	2 lamp 100W drum fixture, opal diffuser actually 22W & 32W compact circline	0	54	0.000	3028	0	None	Retrofit	CFQ28/1		2	27W compact fluorescent spring lamp	0	54	0	0	0.000	0	
206	Women Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	1	72	0.072	3028	218	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	157	0.020	61	
207	Men's Rest Room	F42EE	Wrap	2	1x4 2 lamp 34W, ES ballast, surface mount, prismatic diffuser	9	72	0.648	3028	1,962	None	Retrofit	F42ILL-R		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	9	52	0.468	1,417	0.180	545	
213	Gym	F44EE	Wrap	4	1x4 4 lamp 34W, 2 ES ballasts, surface mount, prismatic diffuser	8	144	1.152	533	614	None	Retrofit	F44ILL-R		4	F32T8 lamps, 1 low watt 4 lamp electronic ballast	8	102	0.816	435	0.336	179	
																Total T12-T8	659				42.024	182,586	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
3	Trailer exterior	I60/1	Jar	1	1 lamp 60W A jelly jar fixture	1	60	0.060	4380	263	None	Replace	CFQ18/1-L		1	New vandal resistant 18W PL wall pack	1	20	0.02	88	0.040	175	
43	Rear Stairwell	I60/1	Jar	1	1 lamp 60W Jelly Jar w/wire cage	2	60	0.120	8760	1,051	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	333	0.082	718	
46	Showers	I75/1	Can	1	1 lamp 75W A, down light can, opal diffuser	2	75	0.150	3028	454	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	2	19	0.038	115	0.112	339	
52	Kitchen Counter	CFQ26/1-L	Can	1	1 lamp 26W compact fluorescent	0	28	0.000	3028	0	None	NO CHANGE	CFQ26/1-L		1	NO CHANGE	0	28	0.000	0	0.000	0	
63	Closet (hall)	I60/1	Keyless	1	1 lamp 60W A keyless	1	60	0.060	780	47	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
70	Basement	I200/1	Keyless	1	1 lamp 200W PS Keyless	8	200	1.600	780	1,248	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	8	42	0.336	262	1.264	986	
91.1		I60/1	Jar	1	1 lamp 60W A jelly jar fixture	1	60	0.060	780	47	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
92	Storage	I60/1	Jar	1	1 lamp 60W A jelly jar fixture	1	60	0.060	780	47	None	Retrofit	CF18/1-SCRW		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
108	Electrical Room - NO ACCESS	I150/1	ESTIMATE - Wrap	1	ESTIMATE - 1x4, 2 lamp 34W, 2 ES ballasts actually 150W keyless	1	150	0.150	780	117	None	Retrofit	CFT40/1		2	F32T8 lamps, 1 low watt 2 lamp electronic ballast	1	42	0.042	33	0.108	84	
112	Stairwell	I150/1	Keyless	1	1 lamp 150W keyless	2	150	0.300	8760	2,628	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	2	42	0.084	736	0.216	1,892	
121	Exterior (under canopy)	I60/2	Square	2	2 lamp 60W A recessed square, opal diffuser	2	120	0.240	4380	1,051	None	Retrofit	CFQ18/1-L		2	19W compact fluorescent spring lamp	2	38	0.076	333	0.164	718	
122	Exterior	CFQ13/1-L	Jar	1	1 lamp 60W A jelly jar fixture actually 13W PL wall pack	0	13	0.000	4380	0	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	0	13	0	0	0.000	0	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
123	Women's Rest Room	I60/2	Drum	2	2 lamp 60W A drum fixture	2	120	0.240	3028	727	None	Retrofit	CFQ18/1-L		2	19W compact fluorescent spring lamp	2	38	0.076	230	0.164	497	
124	Closet	I60/1	Keyless	1	1 lamp 60W A keyless	1	60	0.060	780	47	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	1	19	0.019	15	0.041	32	
125	Mechanical	I60/1	Dome	1	1 lamp 60W A dome fixture	2	60	0.120	780	94	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	2	19	0.038	30	0.082	64	
127	Mechanical	I150/1	Dome	1	1 lamp 150W A dome fixture	1	150	0.150	780	117	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	1	42	0.042	33	0.108	84	
131	Target Area	I150/1	Jar	1	1 lamp 150W Jelly Jar fixture	11	150	1.650	1000	1,650	None	Replace	CFQ13/2		2	New 2 lamp 13W vandal resistant wall pack	11	30	0.33	330	1.320	1,320	
132	Target Area	I100/1	Keyless	1	1 lamp 100W A keyless	4	100	0.400	1000	400	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	4	27	0.108	108	0.292	292	
135	PR3/M	I150/1	Keyless	1	1 lamp 150W keyless	1	150	0.150	3028	454	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	1	19	0.019	58	0.131	397	
141	Armory	CFQ13/1-L	Dome	1	1 lamp 100W A dome fixture actually 13W PL wall pack	0	13	0.000	3028	0	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	0	13	0	0	0.000	0	
142	Hallway	CFQ13/1-L	Dome	1	1 lamp 100W A dome fixture actually 13W PL wall pack	0	13	0.000	3028	0	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	0	13	0	0	0.000	0	
145	Storage	I100/1	Square	1	1 lamp 100W recessed square	2	100	0.200	780	156	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	2	27	0.054	42	0.146	114	
148	Men's Rest Room	I200/2	Drum	2	2 lamp 100W drum fixture, opal diffuser	2	200	0.400	3028	1,211	None	Retrofit	CF28/1-SCRW		2	27W compact fluorescent spring lamp	2	54	0.108	327	0.292	884	
149	Range	I60/1	Track	1	1 lamp 60W A track head	0	60	0.000	3028	0	Dimmer	NO CHANGE	I60/1		1	NO CHANGE	0	60	0	0	0.000	0	
157	Rest Room	I200/2	Drum	2	2 lamp 100W drum fixture, opal diffuser	2	200	0.400	3028	1,211	None	Retrofit	CF28/1-SCRW		2	27W compact fluorescent spring lamp	2	54	0.108	327	0.292	884	

Aloha Systems Measured Savings
12. Biscailuz Recovery Center

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
158	Exterior	I150/1	Jar	1	1 lamp 150W Jelly Jar fixture	3	150	0.450	1000	450	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	3	30	0.09	90	0.360	360	
159	Exterior (under canopy)	I100/1	Square	1	1 lamp 100W recessed square	10	100	1.000	2250	2,250	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	10	27	0.27	608	0.730	1,643	
174	Closets (3)	I100/1	Keyless	1	1 lamp 100W A keyless	2	100	0.200	1000	200	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	2	27	0.054	54	0.146	146	
176	Plumber Shop	I200/1	Keyless	1	1 lamp 200W keyless	5	200	1.000	3028	3,028	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	5	42	0.21	636	0.790	2,392	
179	Carpet Shop Rest Room	CFQ15/1	Keyless	1	1 lamp 15W compact fluorescent	0	15	0.000	3028	0	None	NO CHANGE	CFQ15/1		1	NO CHANGE	0	15	0	0	0.000	0	
192	Gym Hallway	I60/1	Square	1	1 lamp 60W recessed square	2	60	0.120	3028	363	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	2	19	0.038	115	0.082	248	
194	Storage	I100/1	Keyless	1	1 lamp 100A keyless	1	100	0.100	780	78	None	Retrofit	CF28/1-SCRW		1	27W compact fluorescent spring lamp	1	27	0.027	21	0.073	57	
196	Storage	I200/1	Jar	1	1 lamp 200W Jelly Jar fixture	4	200	0.800	780	624	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	4	30	0.12	94	0.680	530	
201	Exercise Room	I100/1	Jar	1	1 lamp 100W Jelly Jar fixture	3	100	0.300	3028	908	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	3	30	0.09	273	0.210	636	
208	Men's Rest Room	I60/1	Square	1	1 lamp 60W recessed square	2	60	0.120	3028	363	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	2	19	0.038	115	0.082	248	
210	Mechanical	I200/1	Keyless	1	1 lamp 200W keyless	2	200	0.400	780	312	None	Retrofit	CFT40/1		1	42W compact fluorescent spring lamp	2	42	0.084	66	0.316	246	
211	Exterior	I60/1	Jar	1	1 lamp 60W Jelly Jar fixture	3	60	0.180	4380	788	None	Replace	CFT13/2		2	New 2 lamp 13W vandal resistant wall pack	3	30	0.09	394	0.090	394	
213	Gym RR	I60/1	Keyless	1	1 lamp 60W A19 keyless	1	60	0.060	3028	182	None	Retrofit	CFQ18/1-L		1	19W compact fluorescent spring lamp	1	19	0.019	58	0.041	124	

Aloha Systems Measured Savings
12. Biscailluz Recovery Center

Aloha Systems Measured Savings 12. Biscailluz Recovery Center																							
Existing Fixtures												New Fixtures								Savings			
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
214	Exterior	I150/1	Knuckle Flood	1	1 lamp 150W PAR 38 flood lamp	8	150	1.200	4380	5,256	None	Retrofit	I90/1		1	90W Halogen PAR 38 flood lamp	8	90	0.72	3,154	0.480	2,102	
																Total INCAN	95				9.057	18,705	
Total						784		96.566			378,049												
Total												784			45	168,327	52.044	209,722					

Biscailuz Recovery Center – 1060 N. Eastern Avenue



Biscailuz Visitor Center



Biscailuz Visitor Center and Offices



Vacant Dormitories



Upstairs Men's Locker Room



T12 Fixtures for Office Next to Car Wash



More T12 Fixtures in Office Next to Car Wash

Biscailuz Recovery Center – 1060 N. Eastern Avenue



Old T12 Fixture Failing to Light Properly



Old T12 Fixtures in Gun Training Classroom



Damaged Old T12 4-Lamp Fixture



Damaged Old T12 Ballast

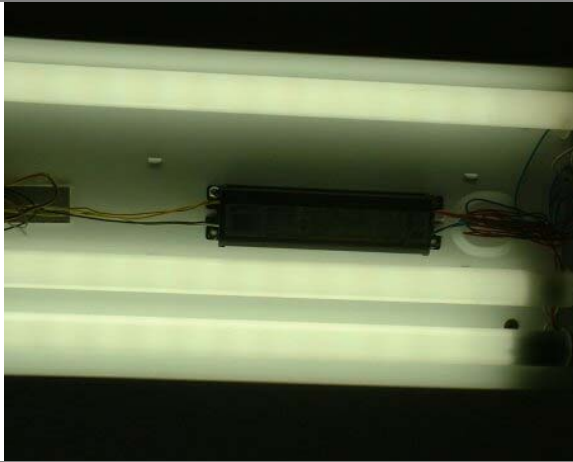


Rapid Start T12 Energy Saving Ballast



Magnetic Ballast T12 4-Lamp Fixture

Biscailuz Recovery Center – 1060 N. Eastern Avenue



Old T12 Magnetic Ballast 4-Lamp Fixture



Old T12 Recessed 4-Lamp Fixture



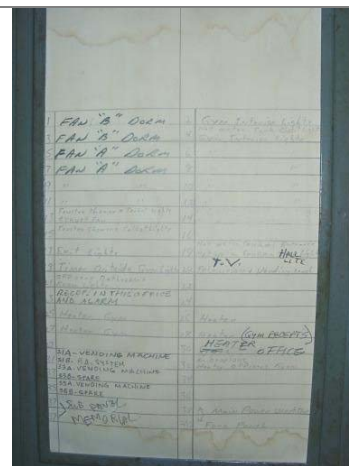
Defective T8 U-Tube Lamps In Machine Shop



Defective T8 Lamp In U Tube Fixture

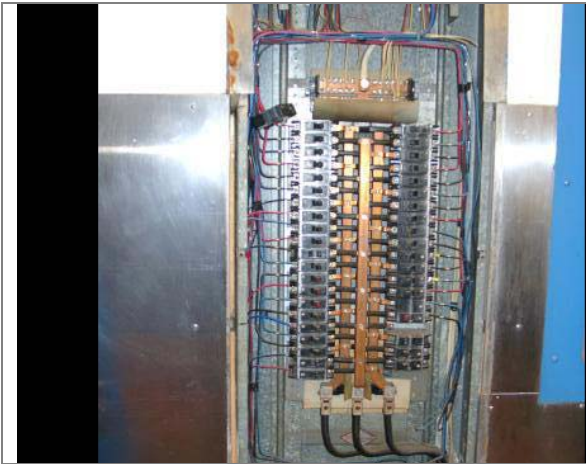


Old Gym Area Breaker Panel With Datalogger



Old Gym Area Breaker Panel Legend

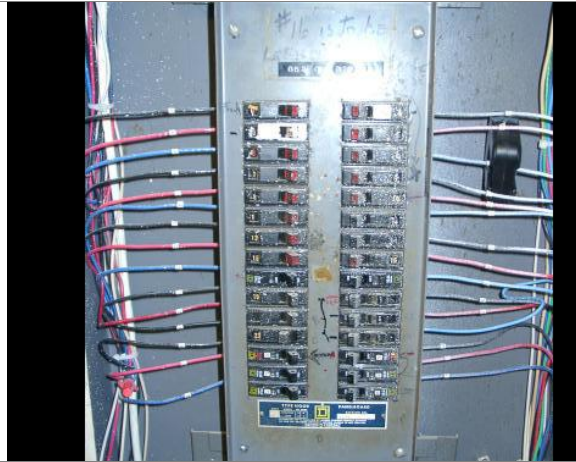
Biscailuz Recovery Center – 1060 N. Eastern Avenue



Kitchen Panel A Breaker Panel



Kitchen Panel A Breaker Panel Legend



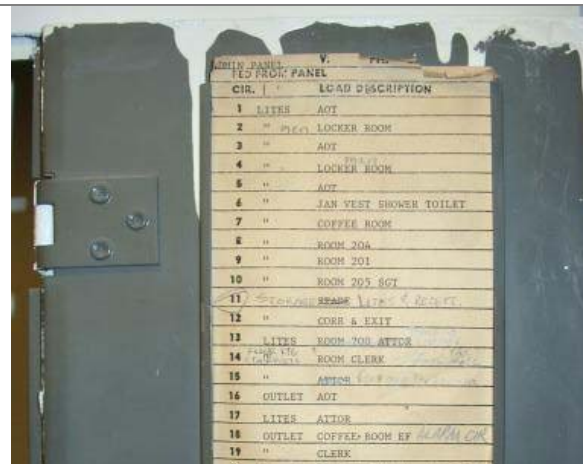
Operations Bureau Panel B With Datalogger



Operations Bureau Panel B Legend

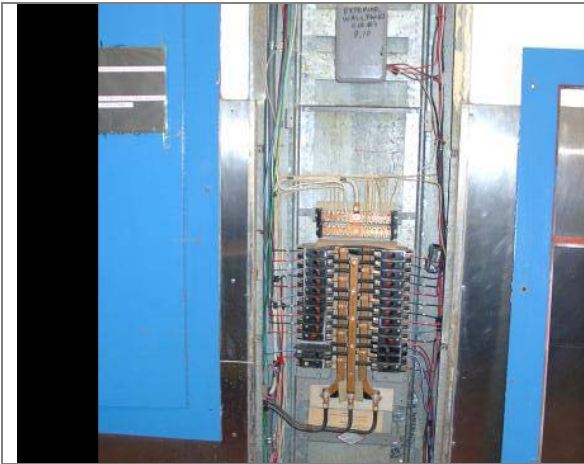


Panel C Breaker Panel



Panel C Breaker Panel Legend

Biscailuz Recovery Center – 1060 N. Eastern Avenue



Kitchen Area Breaker Panel F



Kitchen Area Breaker Panel F Legend

Number	Description	Notes
1	LTS OFFICERS DINNING	
2	LTS OFFICERS SERVING	
3	LTS OFFICERS DIN & KIT	
4	LTS CONFERENCE	
5	LTS OFFICERS DINNING	
6	LTS DATA LOG FRAMES	
7	PLUG, DRINKING, TRUSTERS	
8	LTS OUTSIDE, OUTSIDE	
9	PLUG DRINKING: OFFICERS	
10	LTS OUTSIDE BUILDING	
11	PLUG, OFFICERS CLOCK	
12	LTS CAN OFFICERS NESS	
22	LTS OFFICERS	
23	LTS OFFICERS	
24	LTS OFFICERS	
25	LTS OFFICERS	
26	COOLER BOX RECOG	
27	LTS OFFICERS	
28	LTS OFFICERS	
29	LTS OFFICERS	
30	LTS OFFICERS	
31	LTS OFFICERS	
32	LTS OFFICERS	
33	LTS OFFICERS	

Site Measurement and Verification Report

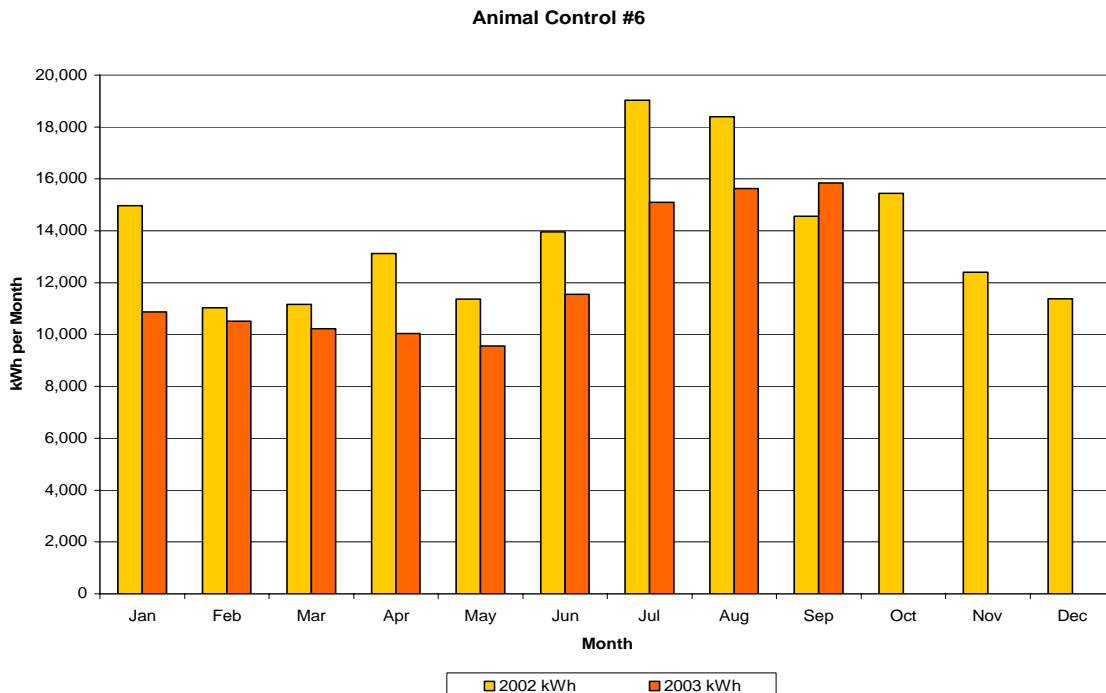
Site Number 13
Animal Control #6
31044 Charley Canyon Rd., Castaic
SCE Account 3-002-8844-05 and 3-002-8844-20

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	17,929 kWh
Contractor's As-Built Estimate	35,817 kWh
<i>Ex-Ante</i> Evaluation	76,382 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	39,186 kWh

Site Description

This facility consists of a main administration office area and animal storage areas. The office area consists of three small offices, a large reception area, lunchroom and a couple closets. Outside there are three other buildings. One building contains dog pens; another building contains a cage area for cats, with a medical room, cat recreation room, and a small outside cleaning facility. The third building is a small barn area in the back of the facility. There is also a small boiler room on the facility. Southern California Edison supplies the facility at 120/208 volts three phase through meter PO726-000491. Its annual energy consumption in 2002 was 166,810 kWh, and its peak demand was 38 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The facility is operational Monday-Saturday from 9:00 a.m. to 5:00 p.m.



Preliminary Site Visit

The site was visited on April 1, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The majority of the facility used energy saver ballasts and 34W fluorescent tubes.

One discrepancy was discovered. Approximately 14% of the 2-lamp fluorescent fixtures contained 40W lamps instead of 34W lamps. This was accounted for by adjusting the wattage of the pre-retrofit fixtures based on a ratio of these lamps. These changes were highlighted in magenta.

Post-Retrofit Audit

The site was again visited on October 16, 2003. The retrofits were verified by means of a general walk through and inspection and no post retrofit discrepancies were noted.

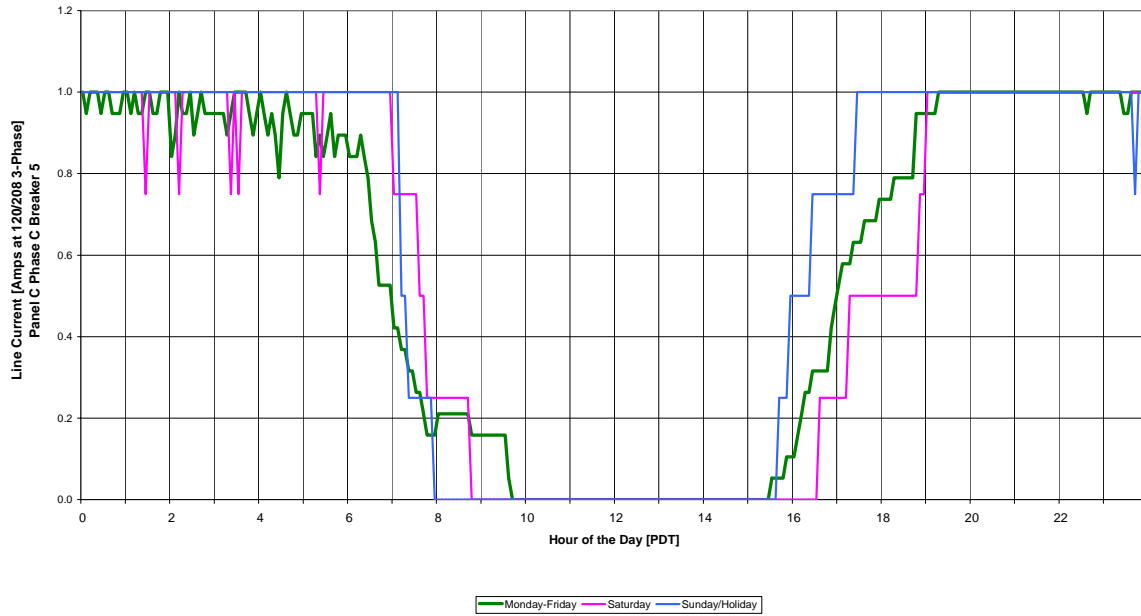
Metered Operating Hours

Although the facility is occupied and operational on a continuous basis, many areas are not in fact used throughout the night and weekends. We collected interval data for lighting loads in five locations. We selected loads that were either variable or were not certain to operate 24 hours per day. Those areas where continuous operation was indicated by local staff were assumed to operate in that manner due to the nature of the facility. The four lighting areas on which we collected data were:

- Kennel Pendant Incandescent Lights
- Kennel Flood Lights
- Kennel Inside Lights
- Main Building Lobby Lights

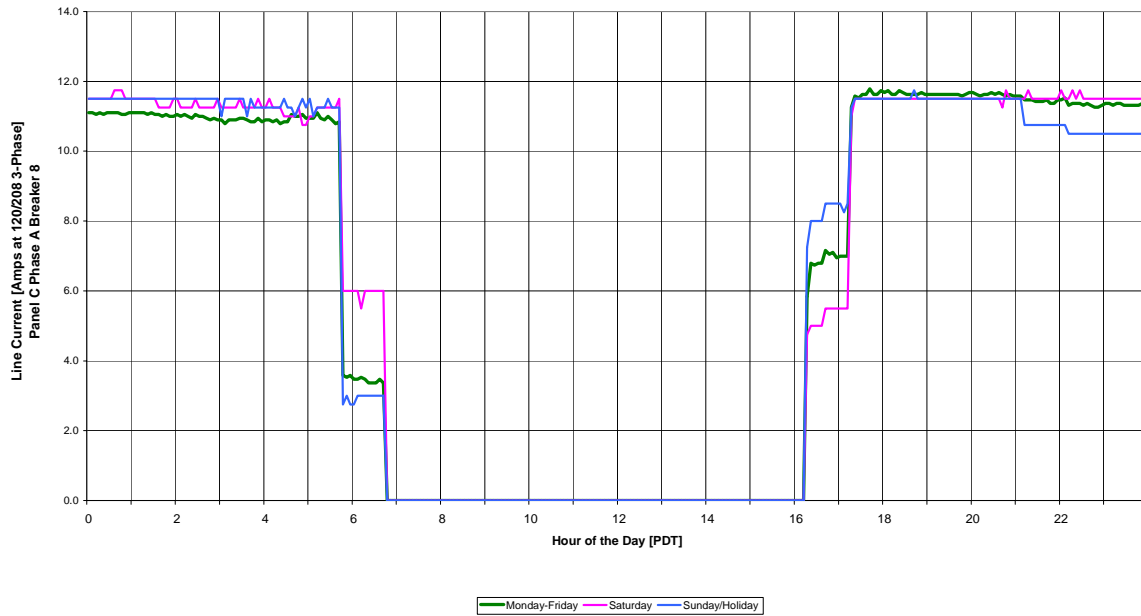
Pendant Incandescent Lights: According to the load profile below these lights in the kennel are on from about 4:00 p.m. until 8:00 a.m. The weekend operation is the same as the weekday operation. The full load equivalent operating time is 5088 hours per year. The contractor as built full load equivalent operating time is 4745 hours.

Animal Control #6 October/November 2003
 Dog Kennel China Hat Lights
 Average Daily Load Profile

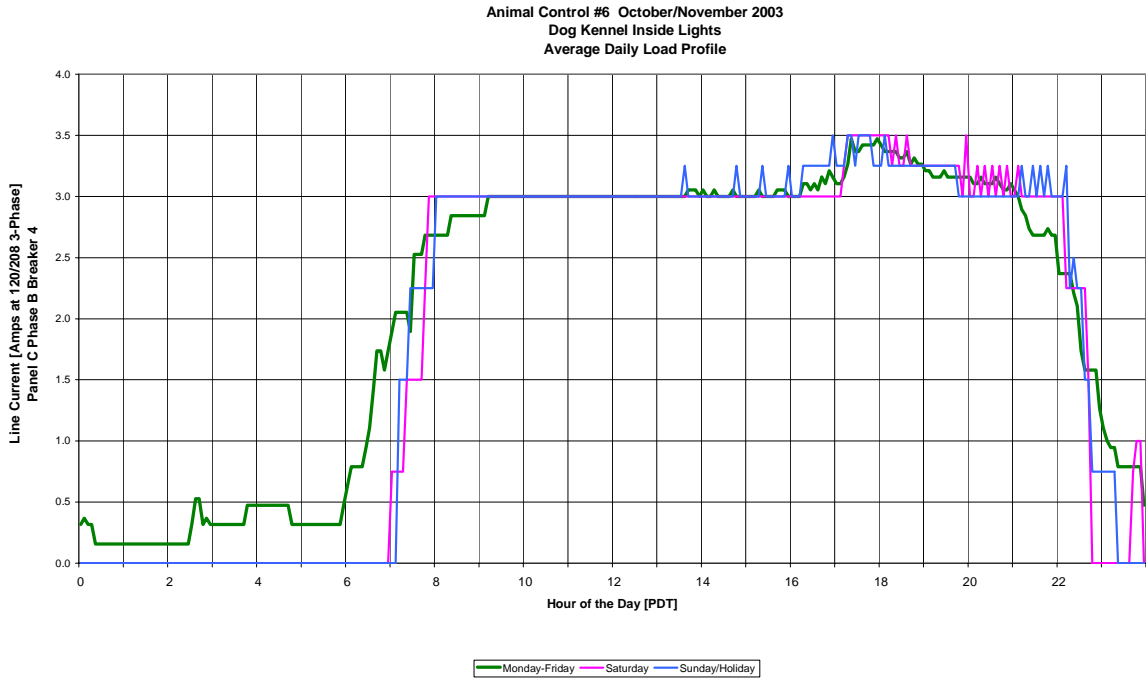


Floodlights: The dog kennel floodlights are on from about 2:00 p.m. until 7:00 a.m. This results in a full load equivalent operating time of 4822 hours per year. The full load equivalent operating time is 4745 for the contractor as-built spreadsheet.

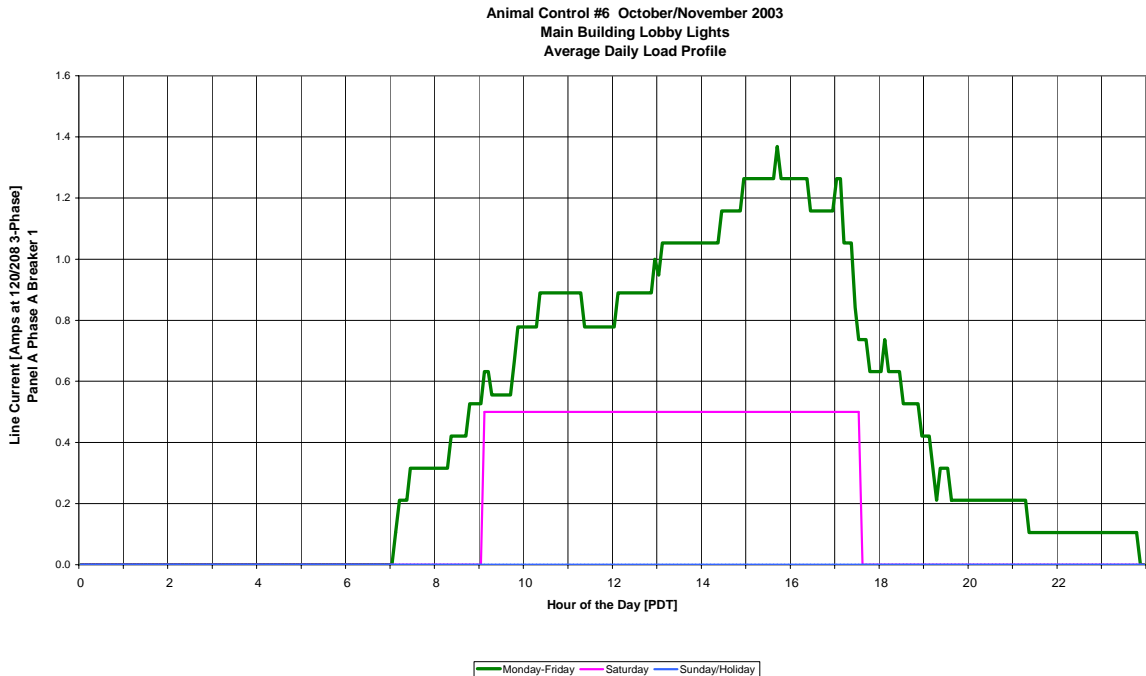
Animal Control #6 October/November 2003
 Dog Kennel Flood Lights
 Average Daily Load Profile



Dog Kennel: The lights inside the dog kennel are on from about 7:00 a.m. until midnight. This results in a full load equivalent operating time of 5,869 hours per year.



Lobby: The lobby lights during the weekday are on from about 8:00 a.m. until 7:00 p.m., although there are times when they are not turned on. Afternoon usage is greater than morning usage. On Saturday the lights remain on from 9:00 a.m. until 5:30 p.m. This results in a full load operating time of 1,622 hours per year. This value was used for the main building operating hours.



Most of the facility had metered values directly applicable to it. The cat facility is enclosed and air conditioned and was lit for less hours than the kennel. The contractor’s operating estimate of 2,880 hours/year is reasonable. The vet building operates, but not as long as the kennel. The contractor used 3,960 for portions of this building, which seems reasonable. This value was applied consistently to the vet building’s main areas.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

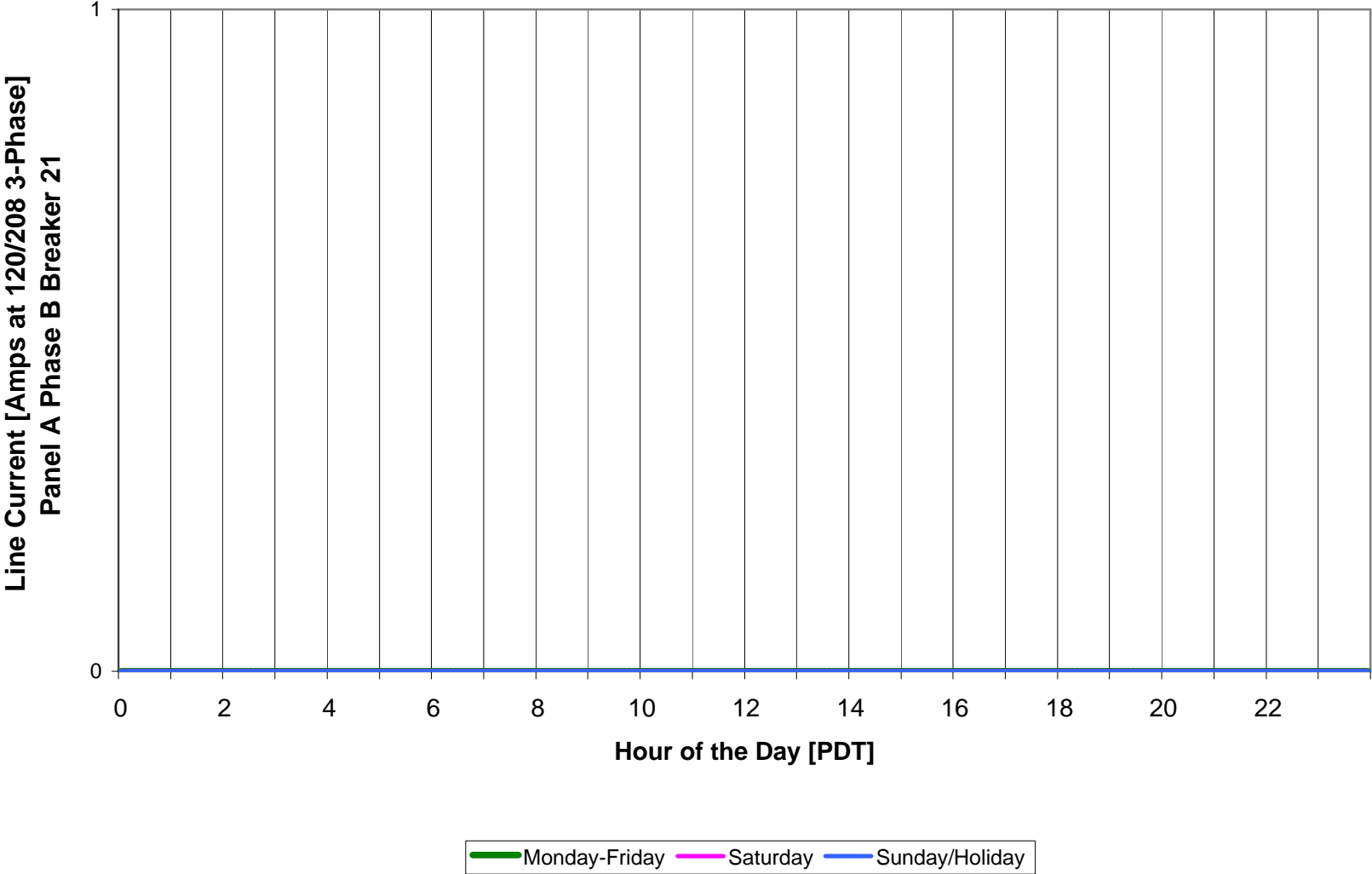
The following table delineates the savings at this site for each of the measure types included in the program.

Animal Control #6 Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit			18	19,473	55,434	19,790
Exit Lights						
T12 to T8	105	10,415	93	8,830	16,055	10,242
Inc to CFL	29	7,514	31	7,514	4,893	9,154
Total	134	17,929	142	35,817	76,382	39,186

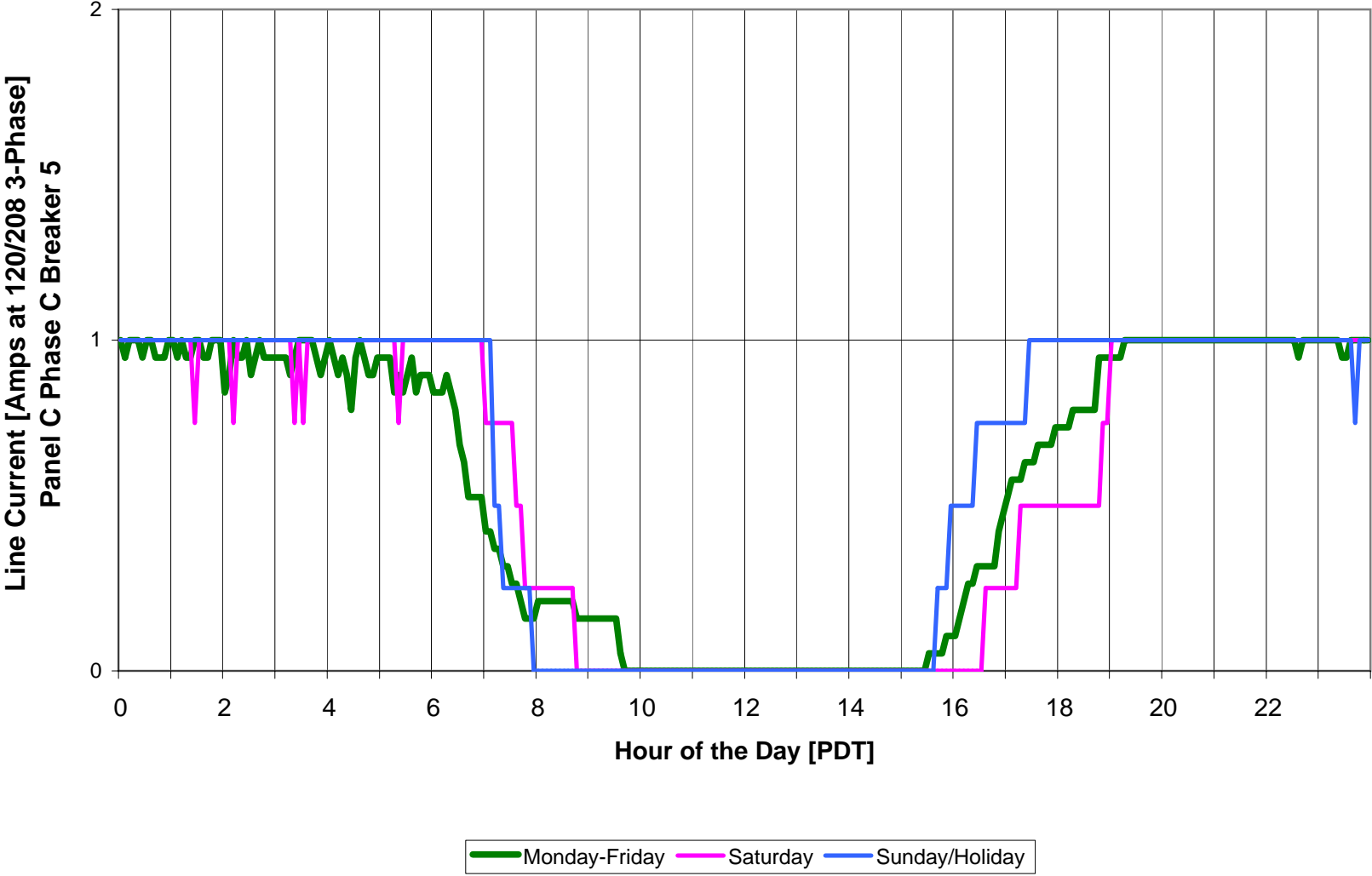
The contractor’s savings estimate and *ex-post* savings calculations are similar because the assumed operating hours were similar to those verified. The *ex-ante* savings is very high, primarily because the average “HID retrofit” in the county program involves larger HID fixtures. These HIDs were added and thus were not included in the “proposed” estimate.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

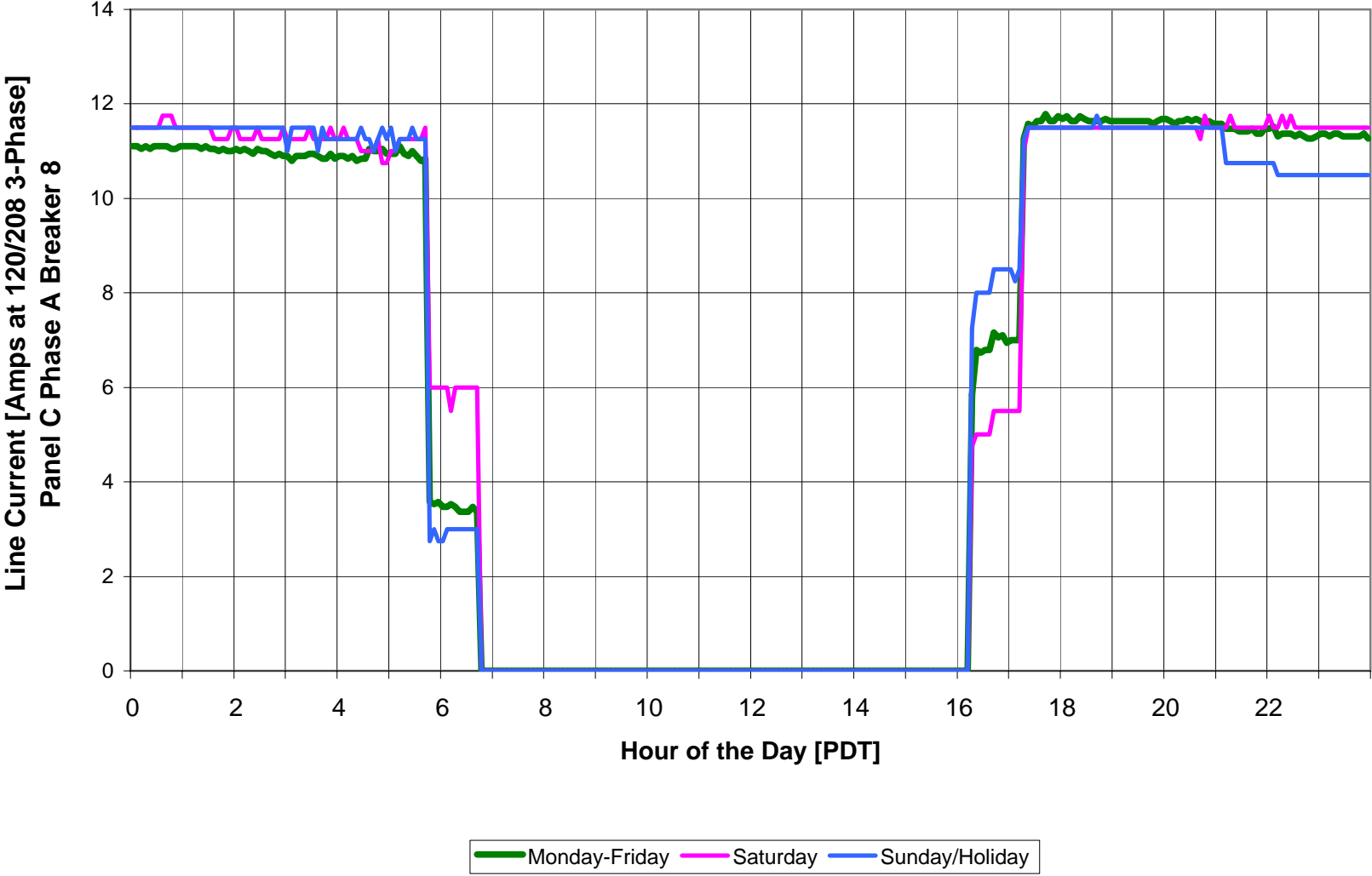
Animal Control #6 October/November 2003
Main Building Flood Lights
Average Daily Load Profile



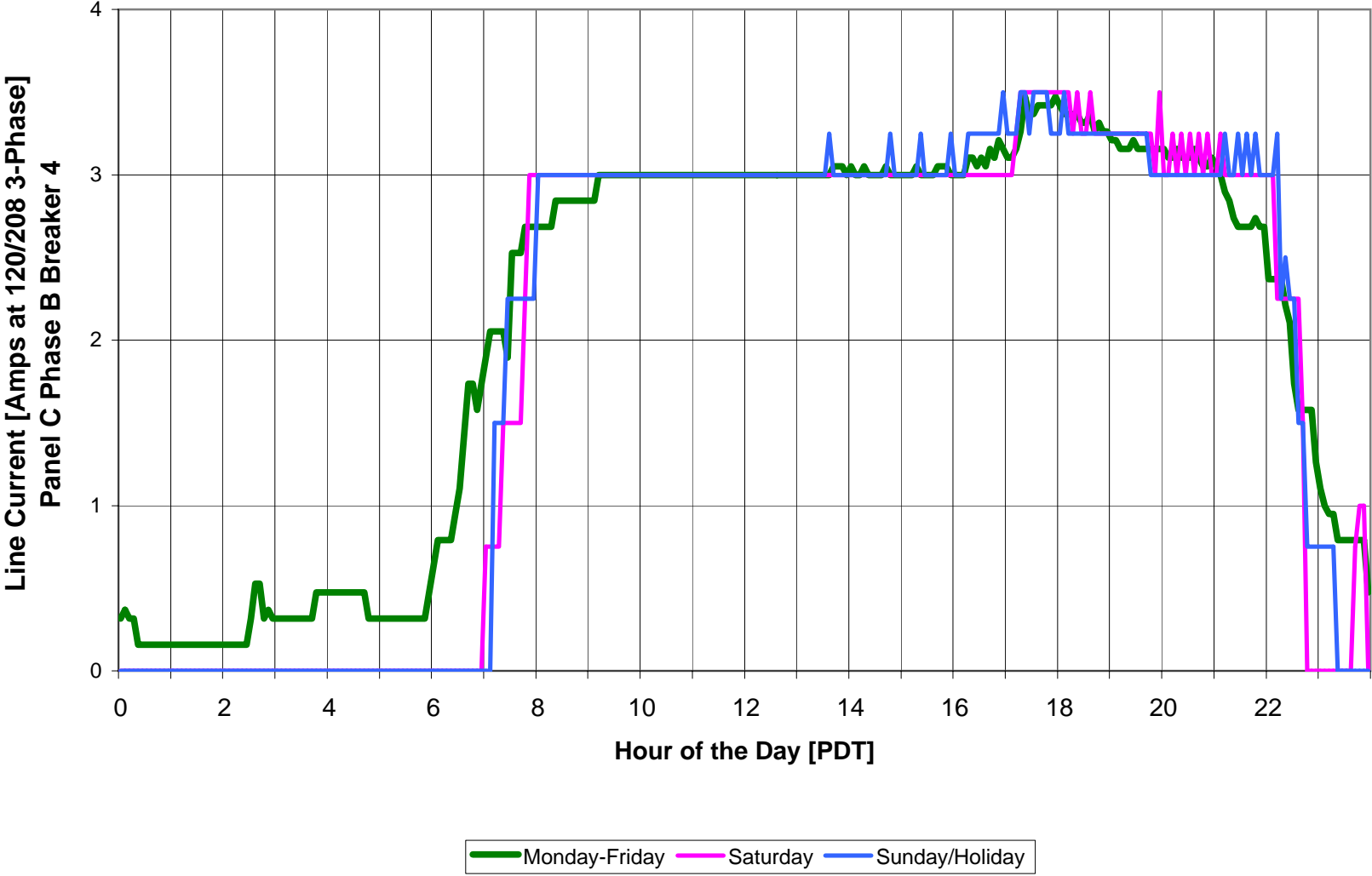
Animal Control #6 October/November 2003
Dog Kennel China Hat Lights
Average Daily Load Profile



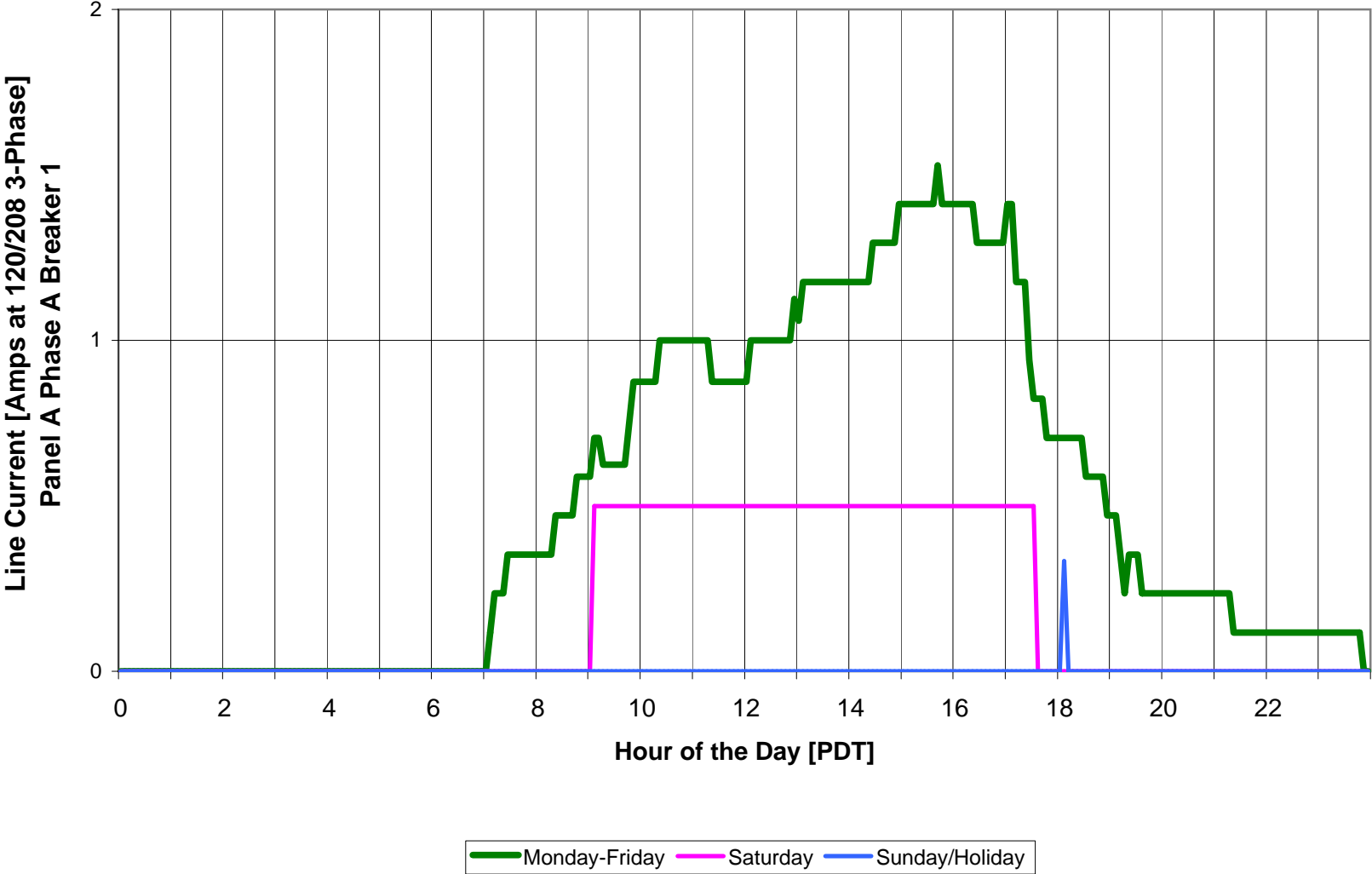
Animal Control #6 October/November 2003
Dog Kennel Flood Lights
Average Daily Load Profile



Animal Control #6 October/November 2003
Dog Kennel Inside Lights
Average Daily Load Profile



Animal Control #6 October/November 2003
Main Building Lobby Lights
Average Daily Load Profile



Contractor As-Built Savings

13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
13	Main Bldg	HPS100/1	WP100HPS1	1	Wall Pack	4	138	0.552	4745	2,619		No Action	HPS100/1		1	Z	4	138	0.552	2,619	0.000	0
20	Dog Bldg	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	Z	0	138	0.000	0	0.000	0
22	Vet Bldg	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	Z	0	138	0.000	0	0.000	0
38	Barn	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	Z	0	138	0.000	0	0.000	0
																Total HID	4				0.000	0
1	Main Office	F42EE	B40PF4/2	2	Surface Box	10	72	0.720	3960	2,851		RETROFIT	F42ILL-R(G3)		2	LBO	10	45	0.450	1,782	0.270	1,069
2	Small Office	F42EE	B40PF4/2	2	Surface Box	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156
3	Main Bldg	F42EE	B40PF2	2	Surface Box	7	72	0.504	8760	4,415		RETROFIT	F42ILL-R(G3)		2	LBO	7	45	0.315	2,759	0.189	1,656
4	Main Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156
5	Main Bldg	F42EE	W40PF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
6	Main Bldg	F42EE	W40PF2	2	Wrap	3	72	0.216	2880	622		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	389	0.081	233
8	Main Bldg	F42EE	W40PF4/2	2	Wrap	2	72	0.144	3960	570		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	356	0.054	214

Contractor As-Built Savings

13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
10	Main Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	3960	570		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	356	0.054	214
11	Main Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	3960	570		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	356	0.054	214
15	Main Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	520	75		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28
16	Main Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	3960	570		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	356	0.054	214
19	Dog Bldg	F42EE	W40PF2	2	Wrap	22	72	1.584	2880	4,562		RETROFIT	F42ILL-R(G3)		2	LBO	22	45	0.990	2,851	0.594	1,711
24	Vet Bldg	F42EE	W40PF2	2	Wrap	6	72	0.432	3960	1,711		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,069	0.162	642
25	Vet Bldg	F42EE	W40PF2	2	Wrap	4	72	0.288	520	150		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	94	0.108	56
27	Vet Bldg	F42EE	W40PF2	2	Wrap	6	72	0.432	3960	1,711		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,069	0.162	642
28	Cat Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	2880	415		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.054	156
29	Cat Bldg	F42EE	W40PF2	2	Wrap	3	72	0.216	2880	622		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	389	0.081	233
30	Vet Bldg	F42EE	W40PF2	2	Wrap	1	72	0.072	2880	207		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	130	0.027	78
31	Vet Bldg	F42EE	W40PF2	2	Wrap	6	72	0.432	2880	1,244		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	778	0.162	467
32	Vet Bldg	F42EE	W40PF2	2	Wrap	2	72	0.144	4745	683		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	427	0.054	256

Contractor As-Built Savings

13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
33	Vet Bldg	F44EE	W40PF4	4	Wrap	2	144	0.288	2880	829		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	507	0.112	323
34	Vet Bldg	F42ILL	W32PF2	2	Wrap	0	59	0.000	2880	0		No Action	F42ILL		2	Z	0	59	0.000	0	0.000	0
35	Vet Bldg	F42EE	W40PF2	2	Wrap	1	72	0.072	520	37		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
40	Vet Bldg	F44EE	W40PF4	4	Wrap	3	144	0.432	520	225		RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	137	0.168	87
																Total T12-T8	93				2.656	8,830
9	Main Bldg	I75/1	I75CI1	1	Industrial	1	75	0.075	520	39		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	17	0.042	22
12	Main Bldg	I60/1	K60CI1	1	Keyless	1	60	0.060	3960	238		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	131	0.027	107
14	Main Bldg	I150/1	I150CI1	1	Industrial	1	150	0.150	520	78		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	17	0.117	61
17	Dog Bldg	I100/1	I100CI1	1	Industrial	20	100	2.000	4745	9,490		RETROFIT	CFQ26/1		1	TCP CFSI	20	33	0.660	3,132	1.340	6,358
21	Dog Bldg	I150/1	I150CI1	1	Industrial	2	150	0.300	520	156		RETROFIT	CFQ26/1		1	TCP CFSI	2	33	0.066	34	0.234	122
23	Vet Bldg	I100/1	FL100K1	1	Flood	0	100	0.000	4745	0		No Action	I100/1		1	Z-? Abandoned	0	100	0.000	0	0.000	0
26	Vet Bldg	I100/1	K100CI1	1	Keyless	1	100	0.100	3960	396		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	131	0.067	265

Contractor As-Built Savings

13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings				
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
36	Vet Bldg	I60/1	FL60K11	1	Flood	1	60	0.060	4745	285		No Action	I60/1		1	CO#2	1	60	0.060	285	0.000	0		
37	Vet Bldg	I60/1	FL60K11	1	Flood	1	60	0.060	4745	285		No Action	I60/1		1	CO#2	1	60	0.060	285	0.000	0		
39	Barn	I100/1	I100CI1	1	Industrial	3	100	0.300	2880	864		RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.099	285	0.201	579		
																Total INCAN	31				2.03	7,514		
7	Main Bldg	I300/1	FL300K11	1	Flood	8	300	2.400	4745	11,388		REPLACE	MH50/1		1	New Metal Halide Flood	8	72	0.576	2,733	1.824	8,655		
18	Dog Bldg	I300/1	FL300K11	1	Flood	10	300	3.000	4745	14,235		REPLACE	MH50/1		1	New Metal Halide Flood	10	72	0.720	3,416	2.280	10,819		
																Total INCAN-HID	18				4.104	19,473		
TOTAL						146		16.113		63,580		TOTAL						146		7.325		27,762	8.788	35,817

Aloha Systems Measured Savings
13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
13	Main Bldg	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	z	0	138	0.000	0	0.000	0
20	Dog Bldg	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	z	0	138	0.000	0	0.000	0
22	Vet Bldg	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	z	0	138	0.000	0	0.000	0
38	Barn	HPS100/1	WP100HPS1	1	Wall Pack	0	138	0.000	4745	0		No Action	HPS100/1		1	z	0	138	0.000	0	0.000	0
																Total HID	0				0.000	0
1	Main Office	F42EE - F42SE	B40PF4/2	2	Surface Box	10	74	0.739	1622	1,199		RETROFIT	F42ILL-R(G3)		2	LBO	10	45	0.450	730	0.289	469
2	Small Office	F42EE - F42SE	B40PF4/2	2	Surface Box	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94
3	Main Bldg	F42EE - F42SE	B40PF2	2	Surface Box	7	74	0.517	8760	4,532		RETROFIT	F42ILL-R(G3)		2	LBO	7	45	0.315	2,759	0.202	1,772
4	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94
5	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	1	74	0.074	1622	120		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	73	0.029	47
6	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	3	74	0.222	1622	360		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	219	0.087	141
8	Main Bldg	F42EE - F42SE	W40PF4/2	2	Wrap	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94

Aloha Systems Measured Savings
13. Animal Control #6

Item	Area Floor	Existing Fixtures										New Fixtures								Savings		
		Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
10	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94
11	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94
15	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94
16	Main Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	1622	240		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	146	0.058	94
19	Dog Bldg	F42EE - F42SE	W40PF2	2	Wrap	22	74	1.626	5869	9,542		RETROFIT	F42ILL-R(G3)		2	LBO	22	45	0.990	5,810	0.636	3,732
24	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	6	74	0.443	3960	1,756		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,069	0.173	687
25	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	4	74	0.296	520	154		RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	94	0.116	60
27	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	6	74	0.443	3960	1,756		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,069	0.173	687
28	Cat Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	2880	426		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	259	0.058	166
29	Cat Bldg	F42EE - F42SE	W40PF2	2	Wrap	3	74	0.222	2880	638		RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	389	0.087	250
30	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	1	74	0.074	3960	293		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	178	0.029	114
31	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	6	74	0.443	3960	1,756		RETROFIT	F42ILL-R(G3)		2	LBO	6	45	0.270	1,069	0.173	687
32	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	2	74	0.148	3960	585		RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	356	0.058	229

Aloha Systems Measured Savings

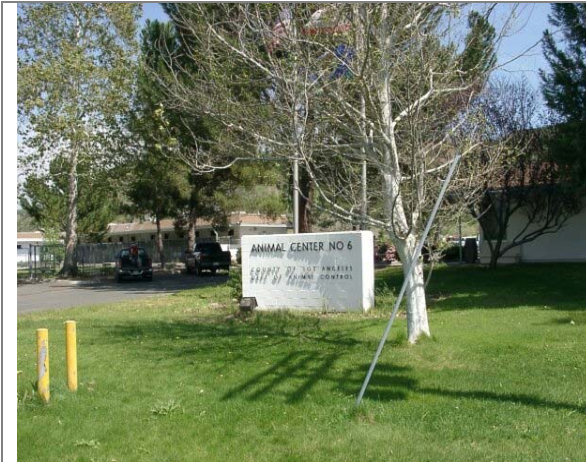
13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
33	Vet Bldg	F44EE	W40PF4	4	Wrap	2	144	0.288	3960	1,140		RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	697	0.112	444
34	Vet Bldg	F42ILL	W32PF2	2	Wrap	0	59	0.000	2880	0		No Action	F42ILL		2	Z	0	59	0.000	0	0.000	0
35	Vet Bldg	F42EE - F42SE	W40PF2	2	Wrap	1	74	0.074	520	38		RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.029	15
40	Vet Bldg	F44EE	W40PF4	4	Wrap	3	144	0.432	520	225		RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	137	0.168	87
																Total T12-T8	93				2.823	10,242
9	Main Bldg	I75/1	I75C1	1	Industrial	1	75	0.075	1622	122		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	54	0.042	68
12	Main Bldg	I60/1	K60C1	1	Keyless	1	60	0.060	1622	97		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	54	0.027	44
14	Main Bldg	I150/1	I150C1	1	Industrial	1	150	0.150	1622	243		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	54	0.117	190
17	Dog Bldg	I100/1	I100C1	1	Industrial	20	100	2.000	5088	10,176		RETROFIT	CFQ26/1		1	TCP CFSI	20	33	0.660	3,358	1.340	6,818
21	Dog Bldg	I150/1	I150C1	1	Industrial	2	150	0.300	5088	1,526		RETROFIT	CFQ26/1		1	TCP CFSI	2	33	0.066	336	0.234	1,191
23	Vet Bldg	I100/1	FL100K1	1	Flood	0	100	0.000	4822	0		No Action	I100/1		1	Z-? Abandoned	0	100	0.000	0	0.000	0
26	Vet Bldg	I100/1	K100C1	1	Keyless	1	100	0.100	3960	396		RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	131	0.067	265

Aloha Systems Measured Savings
13. Animal Control #6

		Existing Fixtures										New Fixtures								Savings			
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
36	Vet Bldg	I60/1	FL60K11	1	Flood	1	60	0.060	4822	289		No Action	I60/1		1	CO#2	1	60	0.060	289	0.000	0	
37	Vet Bldg	I60/1	FL60K11	1	Flood	1	60	0.060	4822	289		No Action	I60/1		1	CO#2	1	60	0.060	289	0.000	0	
39	Barn	I100/1	I100C11	1	Industrial	3	100	0.300	2880	864		RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.099	285	0.201	579	
																Total INCAN	31				2.03	9,154	
7	Main Bldg	I300/1	FL300K11	1	Flood	8	300	2.400	4822	11,573		REPLACE	MH50/1		1	New Metal Halide Flood	8	72	0.576	2,777	1.824	8,795	
18	Dog Bldg	I300/1	FL300K11	1	Flood	10	300	3.000	4822	14,466		REPLACE	MH50/1		1	New Metal Halide Flood	10	72	0.720	3,472	2.280	10,994	
																Total INCAN-HID	18				4.104	19,789	
TOTAL						142		15.728		66,239		TOTAL						142		6.773	27,053	8.955	39,186

Castaic Animal Control #6 – 31044 Charley Canyon Road



Animal Control #6 View From The Highway



Office Surface Mount 2-lamp Fixtures



Office Hallway 2-lamp Fluorescent Fixture



Office Hallway 2-lamp Fixture ES Ballast



Boiler Room 4-lamp Fixture



Boiler Room 4-lamp Fixture Ballast

Castaic Animal Control #6 – 31044 Charley Canyon Road

FOR F30T12 AND F40T12 LAMPS																	
Lamp Qty	Descr	Line Vols	Catalog Number	Certification				Line Current (Amps)	Input Power (Watts)	Ballast Factor	Ballast Efficacy Factor	Creed Factor	THD %	Min. F.C. Start Temp	Sound Rating	Wiring Diag.	Dim.
F30T12 - High Power Factor																	
1	Rapid	220/50Hz	544L-TCP	✓				18	56	71	1.97	<2.0	<20	50/30	A	14	D2
2	Rapid	120/50Hz	542L-TCP-P		*			63	70	85	1.22	<2.0	<32	50/30	A	1	D2
F30T12S5 - High Power Factor																	
1	Rapid	220/50Hz	544L-TCP	✓				17	52	70	2.22	<2.0	<32	60/15	A	14	D2
2	Rapid	120/50Hz	542L-TCP-P		*			60	58	78	1.34	<2.0	<32	60/15	A	1	D2
F40T12 - High Power Factor																	
1	Rapid	120/60Hz	412L-TCP-P		*	*		48	57	95	1.67	<1.7	<20	50/30	A	42	D2
1	Rapid	120/60Hz	W-450L-TCP		*	*		46	55	93	1.67	<2.0	<20	0/-18	A	42	D2
2	Rapid	120/50Hz	W-450L-TCP		*	*		42	42	71	1.69	<2.0	<20	0/-18	A	42	D2
1	Rapid	127/60Hz	594L-TCP-P		*	*		40	48	88	1.67	<1.7	<20	50/30	A	42	D2
1	Rapid	120/60Hz	662L-TCP-P		*	*		25	53	87	1.64	<1.7	<20	50/30	A	42	D2
1	Rapid	220/50Hz	544L-TCP	✓				21	45	76	1.71	<2.0	<32	50/30	A	14	D2
2	Rapid	120/60Hz	446LR-TCP-P		*	*		77	91	93	1.02	<1.7	<20	50/30	A	1	D2
2	Rapid	120/50Hz	342L-TCP		*	*		72	85	85	1.01	<2.0	<20	50/30	A	1	D2
2	Rapid	127/60Hz	595L-TCP-P		*	*		70	87	88	1.01	<1.7	<20	50/30	A	1	D2
2	Rapid	127/50Hz	553L		*	*		69	85	85	1.00	<2.0	<32	50/30	A	1	D2
2	Rapid	220/60Hz	540L-TCP		*	*		42	90	91	1.01	<1.7	<20	50/30	A	1	D2
2	Rapid	220/50Hz	754L-TCP		*	*		43	93	94	1.01	<1.7	<20	50/30	A	1	D2
2	Rapid	240/60Hz	912L-TCP		*	*		42	97	94	0.97	<1.7	<32	50/30	A	1	D2
2	Rapid	240/50Hz	471L-TCP		*	*		39	88	86	0.98	<1.7	<32	50/30	A	1	D2
2	Rapid	277/60Hz	443L-TCP-P		*	*		36	96	94	0.97	<1.7	<20	50/30	A	1	D2



Fluorescent-Electromagnetic

Universal Magnetic Ballast Specification Sheet



Dog Kennel Lighting Fixtures



Outdoor "China Hat" Incandescent Fixtures



Outdoor Perimeter Spotlights



Panel A In Administration Building

Panel C In Dog Kennel

Site Measurement and Verification Report

Site Number 14

DPSS Gain Program Headquarters

3220 Rosemead Blvd., El Monte

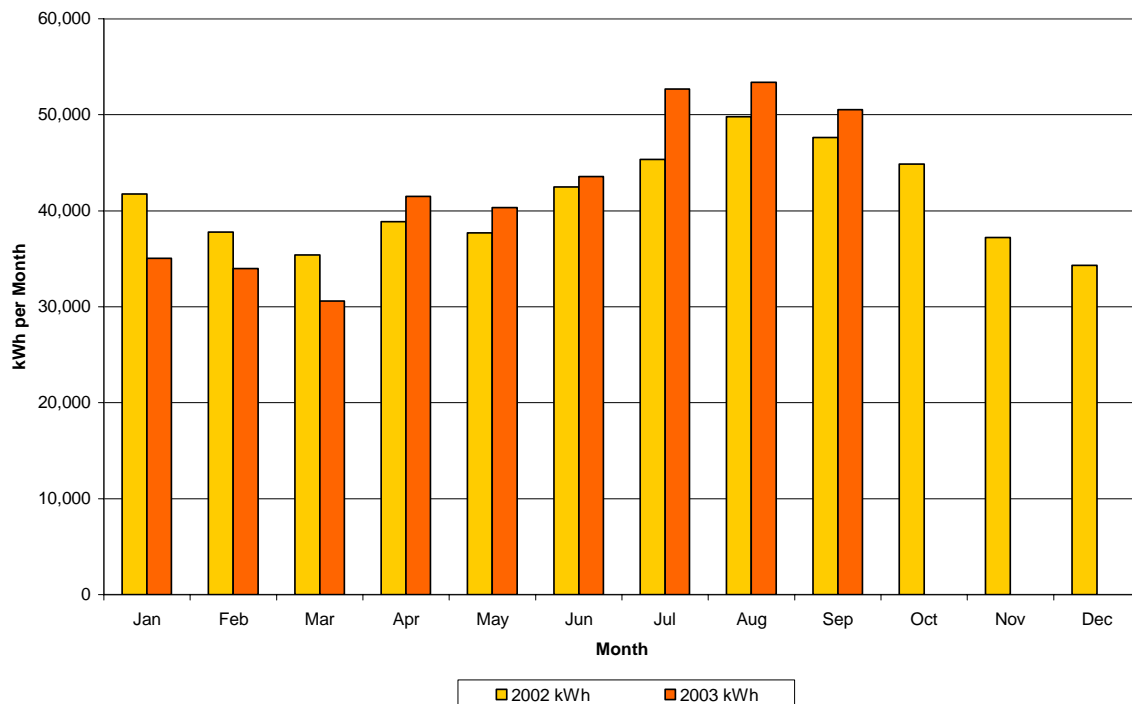
SCE Account 3-013-9970-42

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	68,441 kWh
Contractor's As-Built Estimate	67,953 kWh
<i>Ex-Ante</i> Evaluation	79,773 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	65,840 kWh

Site Description

This facility is an office complex with a variety of smaller office suites. The main suite referenced in the preliminary spreadsheet is Suite #106. Southern California Edison supplies the facility at 480Y/277 volts through meter PO826-007095. Its annual energy consumption in 2002 was 493,200 kWh, and its peak demand was 180 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories. The facility is operational Monday-Thursday from 6:30 a.m. to 7:30 p.m.

DPSS GAIN Program Headquarters



Preliminary Site Visit

The site was visited on February 19, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes. Discrepancies were noted but were later corrected by the contractor's updated spreadsheets.

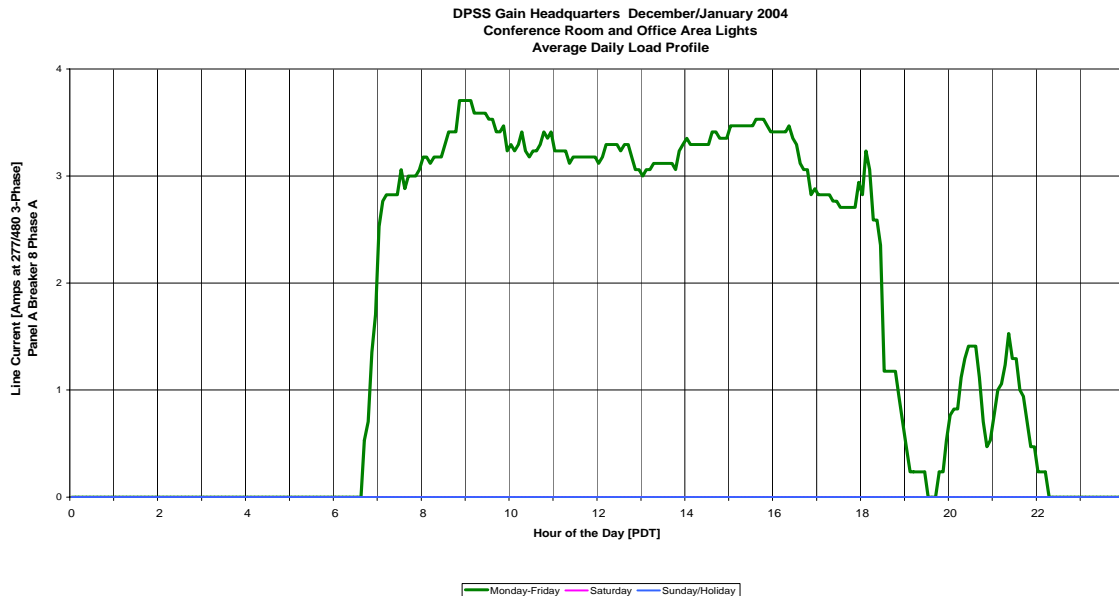
Post-Retrofit Audit

The site was again visited on December 18, 2003. We specifically re-verified the observations noted during the preliminary site visit.

Metered Operating Hours

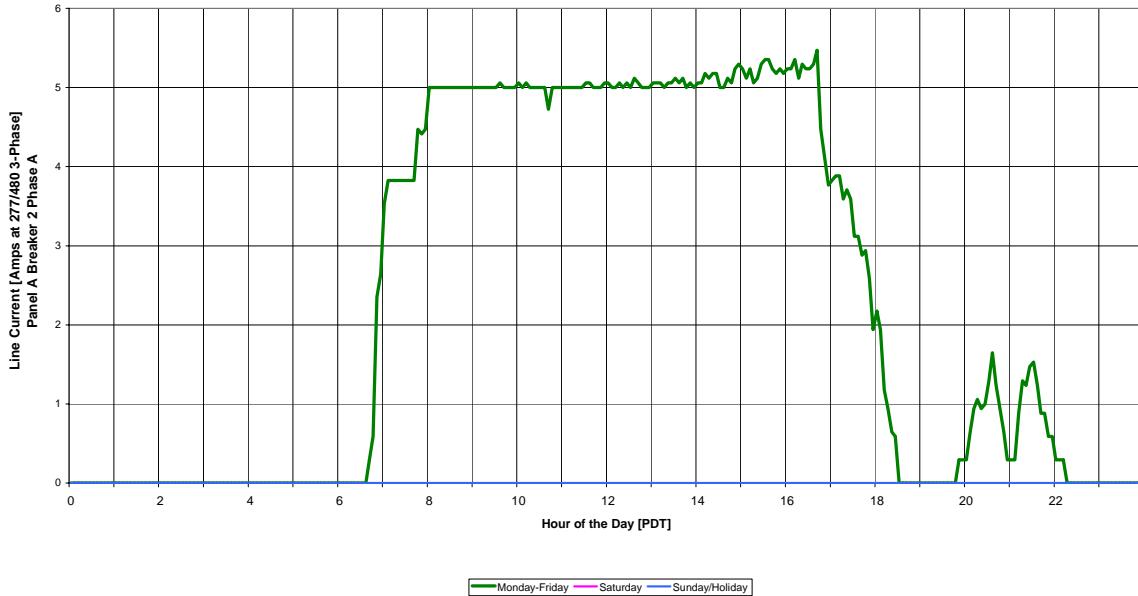
Dataloggers were installed at the facility to verify operating hours. The dataloggers monitored the conference room, office area, computer room, and suite 105. The dataloggers collected data during Christmas and New Year holidays. Because of this more emphasis is placed on the data that was collected after the holiday season, to avoid holiday operating hours.

Offices and Conference Room: The load profile below represents offices and a conference room. The lights are usually in operation from 7:00 a.m. to 6:30 p.m. The full load equivalent operating hours is 2146 hours per year. The full load equivalent operating hours from the contractor as-built spreadsheet is 2600 hours per year.



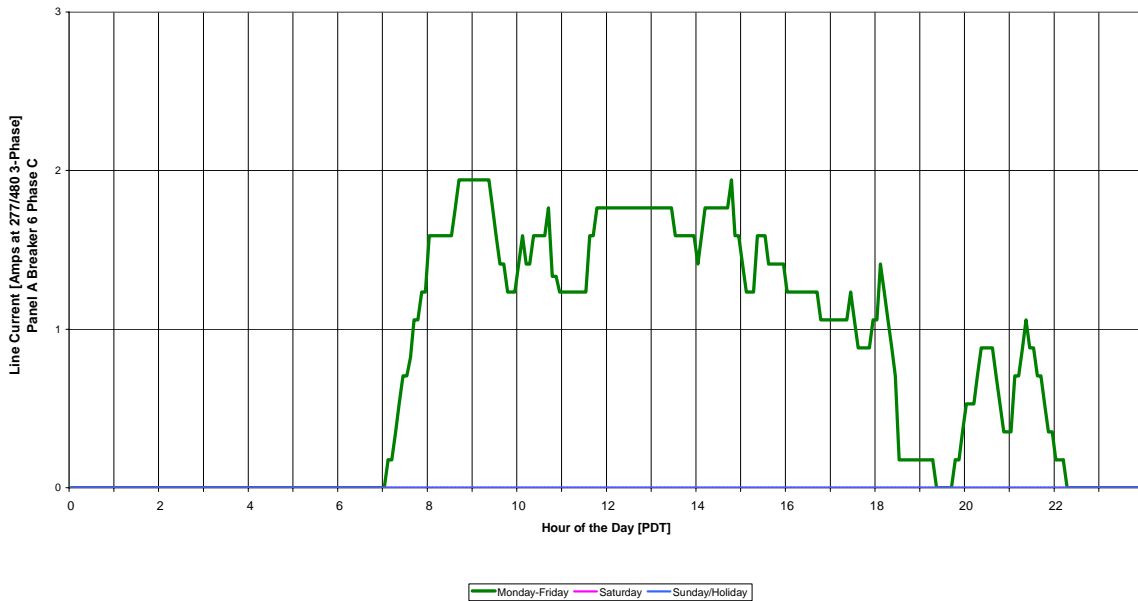
Bullpen: The next load profile represents the bullpen lights. The lights are on for about 10 hours per day. The lights are on from about 7:00 a.m. until 6:00 p.m. The full load equivalent operating time is 2796 hours per year. The contractor as-built full load equivalent operating time is 2600 hours per year.

DPSS Gain Headquarters December/January 2004
 Bullpen Lights
 Average Daily Load Profile



Computer Room: The last load profile represents the lights in the computer room. The lights in the computer room are on for about five and a half hours per day. The lights in the computer room make up a small load. The full load equivalent operating time is 1490 hours per year. The contractor as-built full load equivalent operating time is 2600 hours per year for the computer room.

DPSS Gain Headquarters December/January 2004
 Computer Room Lights
 Average Daily Load Profile



The offices and conference room operating time (2146) was assigned to general office areas as well as the conference room. These resulting hours per year were changed in the spreadsheet and highlighted in tan.

The bullpen operating time (2796) was assigned to the all bullpens in the facility as well as common areas such as restrooms and file rooms. This value is slightly higher than the contractor’s 2600 h/yr value and was highlighted in tan.

The computer room operating time (1490) was assigned to the computer room itself and surrounding associated areas. This value was lower than the contractor’s 2600 h/yr and was therefore highlighted in tan.

If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

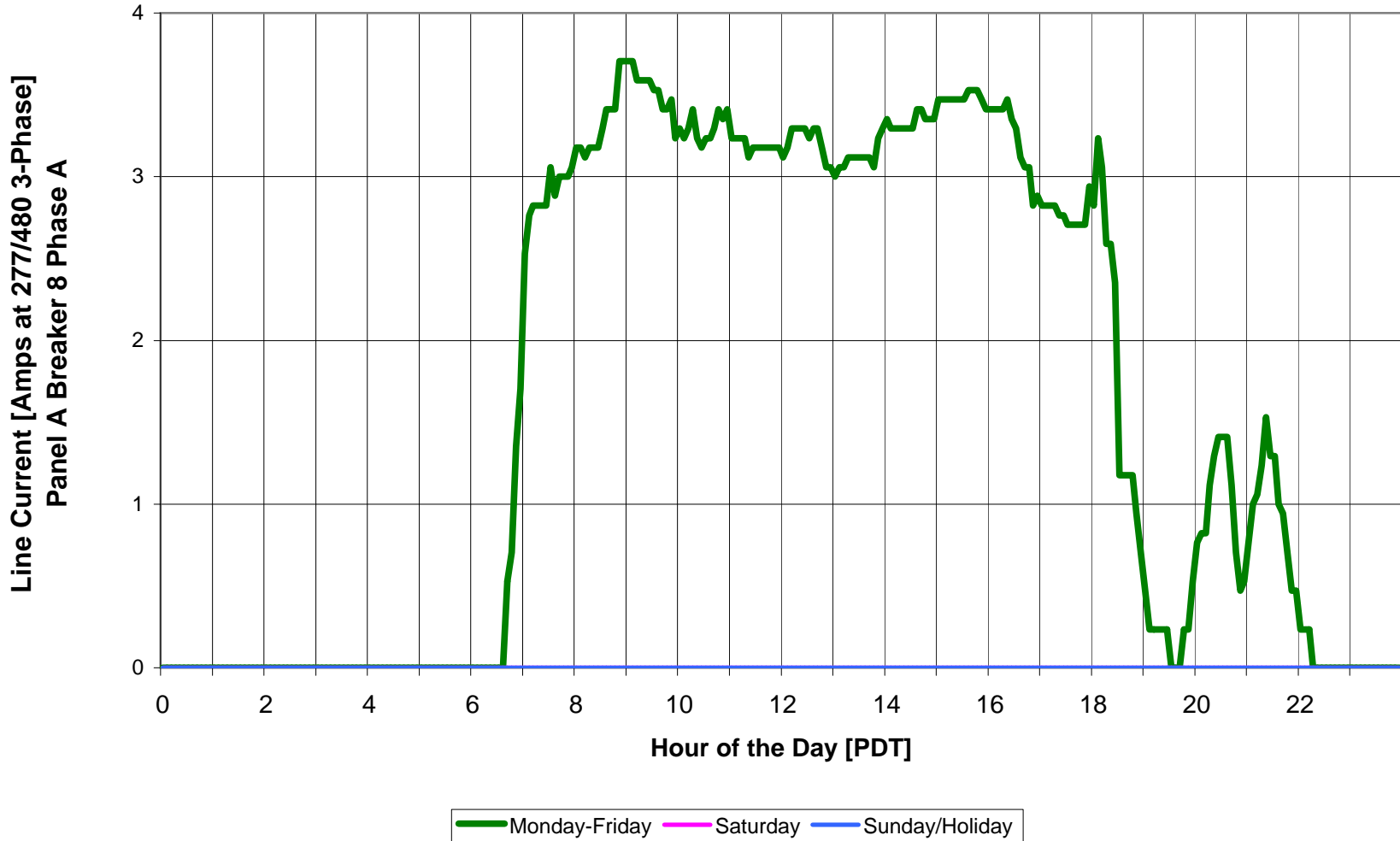
DPSS GAIN Program Headquarters / District Attorney Claims Unit Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	13	2,904	14	3,127	5,053	3,127
T12 to T8	371	50,469	367	49,725	63,355	46,839
Inc to CFL	71	15,068	72	15,101	11,366	15,874
Total	455	68,441	453	67,953	79,773	65,840

The official *ex-ante* savings estimate for this site is higher than either the proposed, as-built, or *ex-post* estimates because the generic operating hours and fixture demand reduction values stipulated in the CPUC spreadsheet for all building sites are higher than those observed at this site. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county's proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

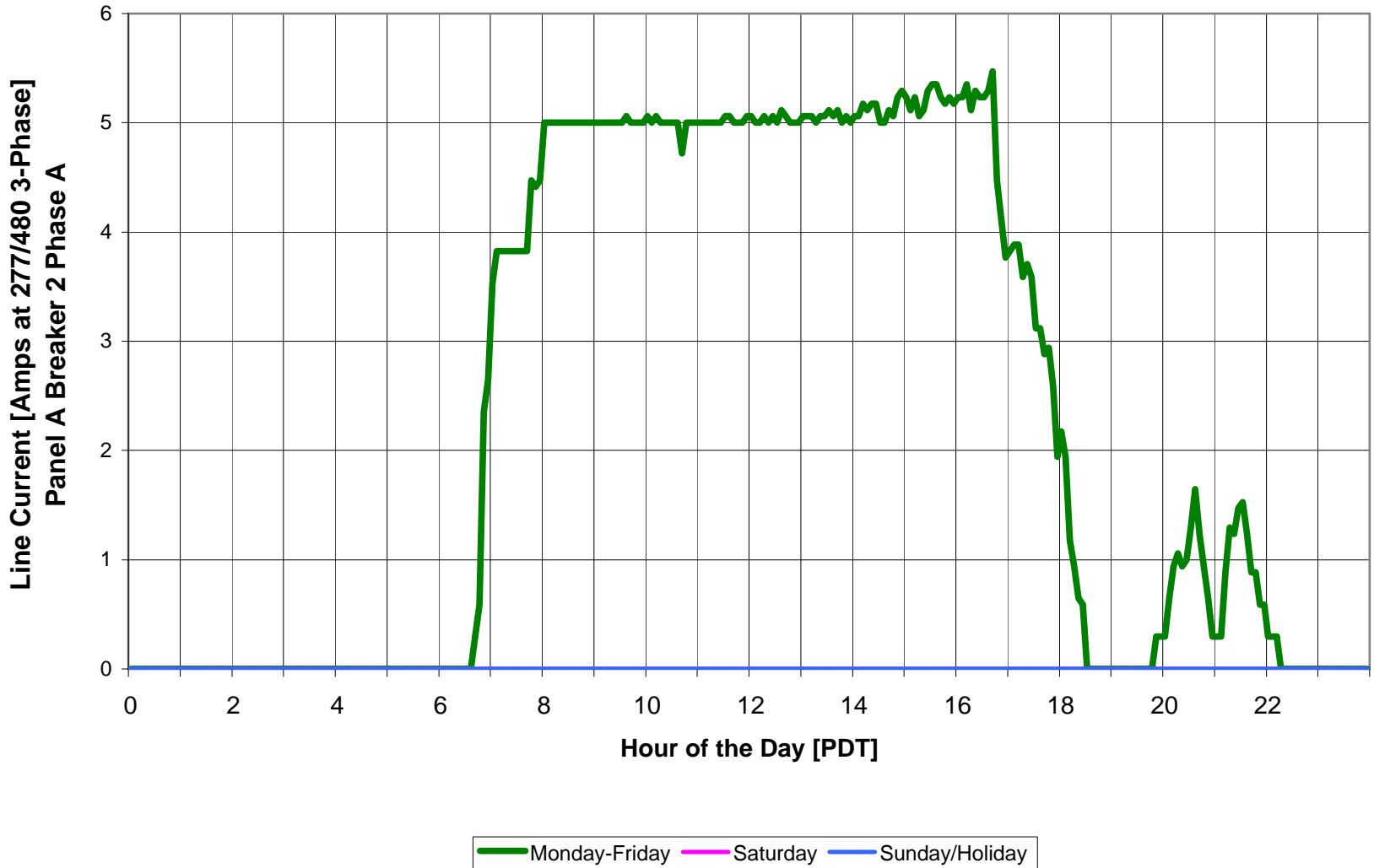
The county's, contractor's, and *ex-post* measured savings are similar because the originally assumed operating hours are similar to those verified by the metering.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

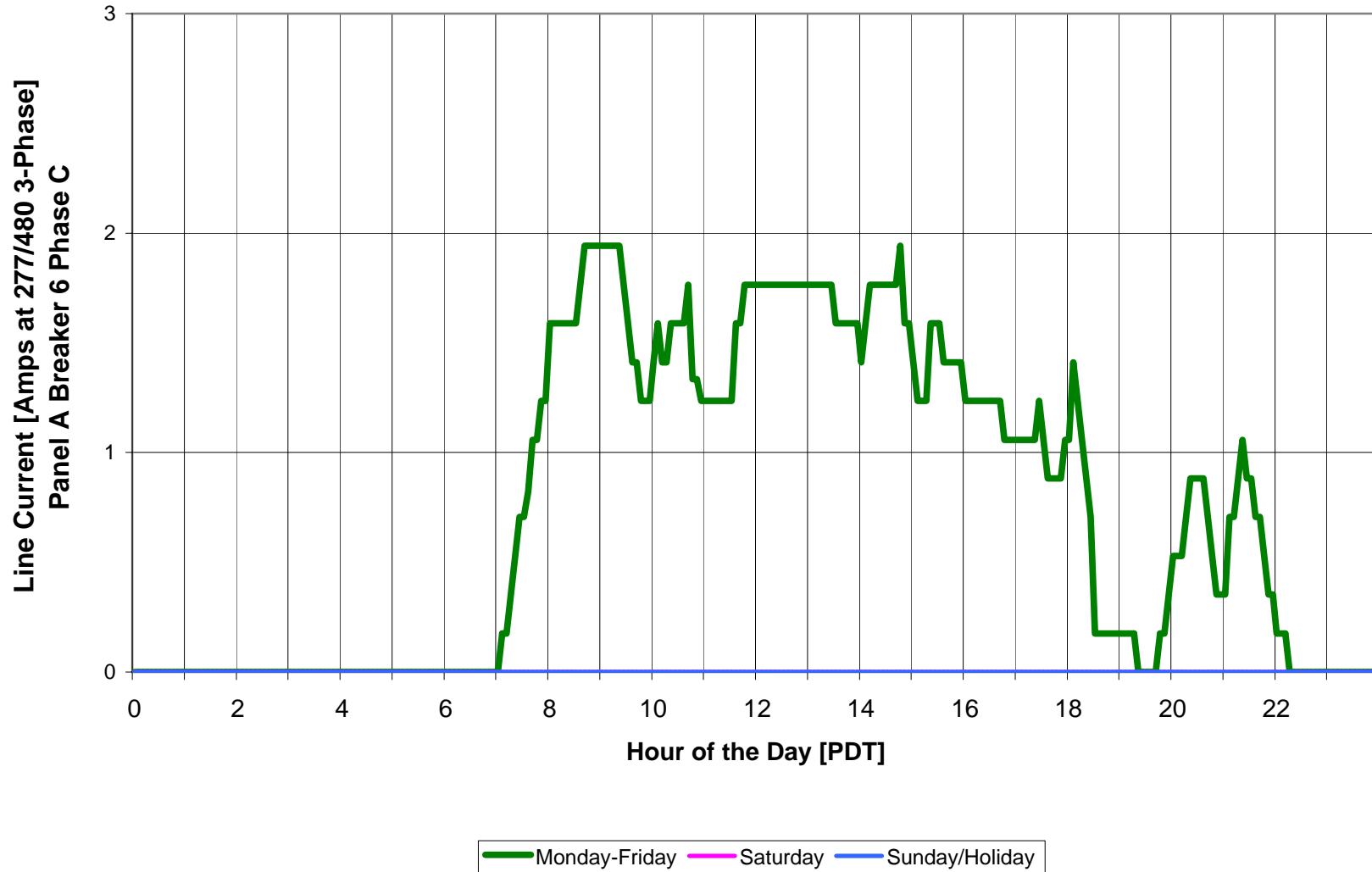
DPSS Gain Headquarters December/January 2004
Conference Room
Average Daily Load Profile



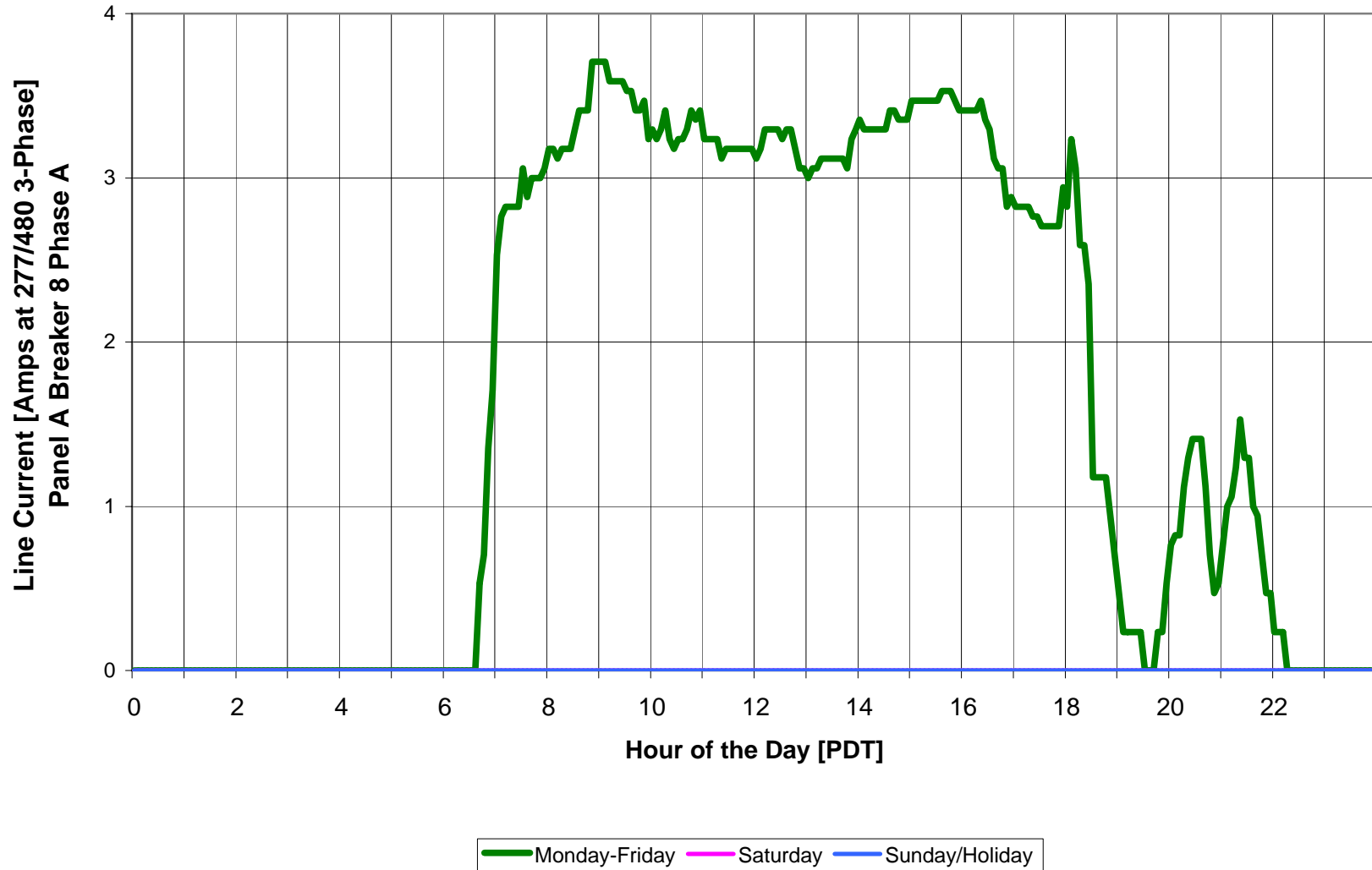
DPSS Gain Headquarters December/January 2004
Bullpen Lights
Average Daily Load Profile



DPSS Gain Headquarters December/January 2004
Computer Room Lights
Average Daily Load Profile



DPSS Gain Headquarters December/January 2004
Conference Room and Office Area Lights
Average Daily Load Profile



Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
3	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.06	8760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
17	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.06	8760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
37	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.06	8760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
39	Kitchen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	1	30	0.03	8760	263		Retrofit	EICC		1	Cold Cathode Retrofit Kit	1	5	0.005	39	0.026	223
44	Computer Lab	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.06	8760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
53	Bullpen #4	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.06	8760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
61	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp 15 watt, green	2	30	0.06	8760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
66	Entry area	E115/2	Exit Sign	2	Exit, LED actually 2 lamp 15W T6	1	30	0.03	8760	263		Retrofit	EICC		1	Cold Cathode Retrofit Kit	1	5	0.005	39	0.026	223
																Total Exits	14				0.357	3,127
2	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	30	115	3.45	2600	8,970	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	30	59	1.770	4,602	1.680	4,368
4	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
5	Copy Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	14	115	1.61	2600	4,186	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	14	59	0.826	2,148	0.784	2,038

Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

Contractor As-Built Savings																						
14. DPSS GAIN Program Headquarters / DA Claims Unit																						
Existing Fixtures													New Fixtures							Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
6	Women's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2600	187		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	135	0.020	52
7	Restroom	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2600	187		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	135	0.020	52
8	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
10	Conference Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	6	115	0.69	2600	1,794	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	6	59	0.354	920	0.336	874
11	Office	F23SS	2x2 Rec Troffer	3	2x2, 3 lamp, F20T12, ES ballast	2	62	0.124	2600	322	AB	Retrofit	F23ILL-R		3	3 F17T8/741 lamps, 1 low watt 2 lamp electronic ballast	2	33	0.066	172	0.058	151
12	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	1	115	0.115	2600	299	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	1	59	0.059	153	0.056	146
16	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	39	115	4.485	2600	11,661	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	39	59	2.301	5,983	2.184	5,678
19	Storage		1x8 Strip	2	1x8, 2 lamp 60 watt, strip, chain hung (4.25)	1	123	0.123	780	96		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast, conversion kit	1	59	0.059	46	0.064	50
20	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2600	897	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	460	0.168	437
21	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
22	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
23	Xerox Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
24	Conference Room	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34U6 lamps, ES ballast	12	72	0.864	2600	2,246	AB	Retrofit	F42ILL-R		2	2 FB21T8/741 lamps, 1 low watt 2 lamp electronic ballast	12	52	0.624	1,622	0.240	624

Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
25	Office (Cook)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2600	897	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	460	0.168	437
26	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
27	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
28	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2600	897	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	460	0.168	437
29	Office (Lee)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2600	897	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	460	0.168	437
31	Women's RR	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	3	72	0.216	4380	946	1G	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	683	0.060	263
34	Men's RR	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	4380	315	1G	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	228	0.020	88
35.1	Men's RR	F82EE	1X8 Troffer	2	1x8, 2 lamp 60W, ES ballast	1	123	0.123	780	96		Retrofit	F42ILL-R		4	4 F32T8 lamps, 1 low watt 4 lamp ballast conversion kit	1	52	0.052	41	0.071	55
36	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	23	115	2.645	2600	6,877	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	23	59	1.357	3,528	1.288	3,349
38	Kitchen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	6	115	0.69	2600	1,794	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	6	59	0.354	920	0.336	874
40	Office (Sylvia) NO ACCESS	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2600	897	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	460	0.168	437
41	Locked Door - NO ACCESS	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	1	115	0.115	2600	299	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	1	59	0.059	153	0.056	146
42	Restroom	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2600	187		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	135	0.020	52

Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
43	Computer Lab	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	28	115	3.22	2600	8,372	Multi	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	28	52	1.456	3,786	1.764	4,586
45	Computer lab storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	7	115	0.805	2600	2,093	AB	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	946	0.441	1,147
47	Men's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	2	72	0.144	2600	374		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	270	0.040	104
48	Women's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	3	72	0.216	2600	562		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	406	0.060	156
49	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	4	115	0.46	2600	1,196	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	4	59	0.236	614	0.224	582
50	Office Storage - NO ACCESS	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	1	115	0.115	2600	299	AB	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	135	0.063	164
51	Bulpen (Rodriguez)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	18	115	2.07	2600	5,382	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	18	62	1.116	2,902	0.954	2,480
52	Bulpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	51	115	5.865	2600	15,249	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	51	59	3.009	7,823	2.856	7,426
54	Bulpen #4	F23SS	2x2 Rec Troffer	3	2x2, 3 lamp 25W lamps, 2 ES ballast	1	99	0.099	2600	257	AB	Retrofit	F23ILL-R		3	3 F17T8/741 lamps, 1 low watt 3 lamp electronic ballast	1	72	0.072	187	0.027	70
55	BP#4 Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	4	115	0.46	2600	1,196	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	4	62	0.248	645	0.212	551
56	Women's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	3	72	0.216	2600	562		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	460	0.039	101
60	Bulpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	37	115	4.255	2600	11,063	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	37	59	2.183	5,676	2.072	5,387
60.1	Bulpen	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp FB34T12, ES ballast	1	72	0.072	2600	187	None	Retrofit	F42ILL-R		2	2 FB32T8/741 lamps, 1 std 2 lamp electronic ballast	1	52	0.052	135	0.020	52

Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
62	Office (Pilapil)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	322	0.106	276
63	Office (Stiles)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	322	0.106	276
64	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	307	0.112	291
67	Comm Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	322	0.106	276
68	Office (Tucker)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	322	0.106	276
69	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	322	0.106	276
70	Office (Hill)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.23	2600	598	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	322	0.106	276
71	File Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2600	897	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	3	62	0.186	484	0.159	413
72	File Room	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34U6 lamps, ES ballast	5	72	0.36	2600	936	AB	Retrofit	F42ILL-R		2	2 FB21T8/741 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.260	676	0.100	260
73	Lunch Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	6	115	0.69	2600	1,794	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	6	62	0.372	967	0.318	827
75	Restroom	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	4	72	0.288	4380	1,261	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	4	59	0.236	1,034	0.052	228
77	Women's RR	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	2	72	0.144	4380	631	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	517	0.026	114
78	Women's RR	F82EE	1x8 Rec Troffer	2	1x8, 2 lamp 60 watt, recessed, (11.5)	1	123	0.123	780	96		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast, conversion kit	1	59	0.059	46	0.064	50

Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings			
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
																Total T12-T8	367					19.156	49,725
9	Storage	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	2	60	0.12	780	94		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	2	19	0.038	30	0.082	64	
13	Exterior	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	4	75	0.3	4380	1,314		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	4	19	0.076	333	0.224	981	
18	Entry area	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	3	75	0.225	4380	986		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	3	19	0.057	250	0.168	736	
30	Hall	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	2	75	0.15	4380	657		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	2	19	0.038	166	0.112	491	
32	Women's RR	I60/1	Globe	1	Globe, 60A lamp, ceiling mount	1	60	0.06	780	47		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32	
33	Closet	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	1	60	0.06	780	47		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32	
35	Men's RR	I60/1	Globe	1	Globe, 60A lamp, ceiling mount	1	60	0.06	780	47		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32	
46	Computer lab storage	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	1	60	0.06	780	47		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32	
57	Men's RR	I60/1	Globe	1	Globe, 60A lamp, ceiling mount	2	60	0.12	780	94		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	2	19	0.038	30	0.082	64	
58	Exterior	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	2	75	0.15	4380	657		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	2	19	0.038	166	0.112	491	
65	Entry Area	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	6	75	0.45	4380	1,971		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	6	19	0.114	499	0.336	1,472	

Contractor As-Built Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
74	Hall	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	2	75	0.15	4380	657		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	2	19	0.038	166	0.112	491
76	Closet	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	1	60	0.06	780	47		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32
79	Stairwell	I60/1	Jelly Jar	1	Jelly Jar, 60A lamp, wall mount, opal lens	3	60	0.18	780	140		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp	3	19	0.057	44	0.123	96
80	Stairwell	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	3	75	0.225	4380	986		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	3	19	0.057	250	0.168	736
81	Exterior - Bldg perimeter	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	38	75	2.85	4380	12,483		Retrofit	CFT18/1		1	19 watt compact fluorescent lamp, R40 lens	38	19	0.722	3,162	2.128	9,321
																Total INCAN	72				3.852	15,101
					Total	453		46.07		129,679						Total	453		22.705	61,726	23.365	67,953

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
3	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.060	8,760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
17	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.060	8,760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
37	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.060	8,760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
39	Kitchen	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	1	30	0.030	8,760	263		Retrofit	EICC		1	Cold Cathode Retrofit Kit	1	5	0.005	39	0.026	223
44	Computer Lab	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.060	8,760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
53	Bullpen #4	E115/2	Exit Sign	2	Exit, 2 lamp, 15 watt, with batt backup and bug eyes	2	30	0.060	8,760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
61	Bullpen	E115/2	Exit Sign	2	Exit, 2 lamp 15 watt, green	2	30	0.060	8,760	526		Retrofit	EICC		1	Cold Cathode Retrofit Kit	2	5	0.009	79	0.051	447
66	Entry area	E115/2	Exit Sign	2	Exit, LED actually 2 lamp 15W T6	1	30	0.030	8,760	263		Retrofit	EICC		1	Cold Cathode Retrofit Kit	1	5	0.005	39	0.026	223
																Total Exits	14				0.357	3,127
2	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	30	115	3.450	2,796	9,646	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	30	59	1.770	4,949	1.680	4,697
4	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	253	0.112	240
5	Copy Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	14	115	1.610	2,146	3,455	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	14	59	0.826	1,773	0.784	1,682

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures											New Fixtures								Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
6	Women's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2,146	155		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	112	0.020	43
7	Restroom	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2,146	155		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	112	0.020	43
8	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	520	120		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	61	0.112	58
10	Conference Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	6	115	0.690	2,146	1,481	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	6	59	0.354	760	0.336	721
11	Office	F23SS	2x2 Rec Troffer	3	2x2, 3 lamp, F20T12, ES ballast	2	62	0.124	2,146	266	AB	Retrofit	F22ILL-R		3	3 F17T8/741 lamps, 1 low watt 2 lamp electronic ballast	2	33	0.066	142	0.058	124
12	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	1	115	0.115	2,146	247	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	1	59	0.059	127	0.056	120
16	Bulpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	39	115	4.485	2,796	12,540	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	39	59	2.301	6,434	2.184	6,106
19	Storage	F82EE	1x8 Strip	2	1x8, 2 lamp 60 watt, strip, chain hung (4.25)	1	123	0.123	520	64		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast, conversion kit	1	59	0.059	31	0.064	33
20	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2,146	740	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	380	0.168	361
21	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	520	120	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	61	0.112	58
22	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	520	120	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	61	0.112	58
23	Xerox Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	253	0.112	240
24	Conference Room	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34U6 lamps, ES ballast	12	72	0.864	2,146	1,854	AB	Retrofit	F42ILL-R		2	2 FB21T8/741 lamps, 1 low watt 2 lamp electronic ballast	12	52	0.624	1,339	0.240	515

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
25	Office (Cook)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2,146	740	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	380	0.168	361
26	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	253	0.112	240
27	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	253	0.112	240
28	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2,146	740	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	380	0.168	361
29	Office (Lee)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2,146	740	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	380	0.168	361
31	Women's RR	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	3	72	0.216	2,796	604	1G	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	436	0.060	168
34	Men's RR	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2,796	201	1G	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	145	0.020	56
35.1	Men's RR	F82EE	1X8 Troffer	2	1x8, 2 lamp 60W, ES ballast	1	123	0.123	2,796	344		Retrofit	F42ILL-R		4	4 F32T8 lamps, 1 low watt 4 lamp ballast conversion kit	1	52	0.052	145	0.071	199
36	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	23	115	2.645	2,796	7,395	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	23	59	1.357	3,794	1.288	3,601
38	Kitchen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	6	115	0.690	2,146	1,481	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	6	59	0.354	760	0.336	721
40	Office (Sylvia) NO ACCESS	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2,146	740	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	380	0.168	361
41	Locked Door - NO ACCESS	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	1	115	0.115	2,146	247	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	1	59	0.059	127	0.056	120
42	Restroom	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	1	72	0.072	2,796	201		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	145	0.020	56

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures										Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
43	Computer Lab	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	28	115	3.220	1,490	4,798	Multi	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	28	52	1.456	2,169	1.764	2,628	
45	Computer lab storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	7	115	0.805	1,490	1,199	AB	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	7	52	0.364	542	0.441	657	
47	Men's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	2	72	0.144	2,796	403		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	2	52	0.104	291	0.040	112	
48	Women's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	3	72	0.216	2,796	604		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	3	52	0.156	436	0.060	168	
49	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	4	115	0.460	2,146	987	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	4	59	0.236	506	0.224	481	
50	Office Storage - NO ACCESS	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	1	115	0.115	2,146	247	AB	Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 low watt 2 lamp electronic ballast	1	52	0.052	112	0.063	135	
51	Bullpen (Rodriguez)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	18	115	2.070	2,796	5,788	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	18	62	1.116	3,120	0.954	2,667	
52	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	51	115	5.865	2,796	16,399	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	51	59	3.009	8,413	2.856	7,985	
54	Bullpen #4	F23SS	2x2 Rec Troffer	3	2x2, 3 lamp 25W lamps, 2 ES ballast	1	99	0.099	2,796	277	AB	Retrofit	F23ILL		3	3 F17T8/741 lamps, 1 low watt 3 lamp electronic ballast	1	72	0.072	201	0.027	75	
55	BP#4 Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	4	115	0.460	2,796	1,286	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	4	62	0.248	693	0.212	593	
56	Women's RR	F42EE	1x4 Wrap	2	1x4, 2 lamp F34T12, ES ballast	3	72	0.216	2,796	604		Retrofit	F42ILL-R		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	3	59	0.177	495	0.039	109	
60	Bullpen	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	37	115	4.255	2,796	11,897	Multi	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	37	59	2.183	6,104	2.072	5,793	
60.1	Bullpen	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp FB34T12, ES ballast	1	72	0.072	2,796	201	None	Retrofit	F42ILL-R		2	2 FB32T8/741 lamps, 1 std 2 lamp electronic ballast	1	52	0.052	145	0.020	56	

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
62	Office (Pilapil)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	266	0.106	227
63	Office (Stiles)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	266	0.106	227
64	Storage	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	520	120	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	61	0.112	58
67	Comm Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	266	0.106	227
68	Office (Tucker)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	266	0.106	227
69	Office	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	266	0.106	227
70	Office (Hill)	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	2	115	0.230	2,146	494	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	2	62	0.124	266	0.106	227
71	File Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	3	115	0.345	2,796	965	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	3	62	0.186	520	0.159	445
72	File Room	FU2EE	2x2 Rec Troffer	2	2x2, 2 lamp F34U6 lamps, ES ballast	5	72	0.360	2,796	1,007	AB	Retrofit	F42ILL-R		2	2 FB21T8/741 lamps, 1 low watt 2 lamp electronic ballast	5	52	0.260	727	0.100	280
73	Lunch Room	F43EE	2x4 Rec Troffer	3	2x4, 3 lamp F34T12, ES ballast	6	115	0.690	2,796	1,929	AB	Retrofit	F42ILL		2	2 F32T8/741 lamps, 2 std watt 1 lamp electronic ballast	6	62	0.372	1,040	0.318	889
75	Restroom	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	4	72	0.288	2,796	805	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	4	59	0.236	660	0.052	145
77	Women's RR	F42EE	1x4 Rec Troffer	2	1x4, 2 lamp F34T12, ES ballast	2	72	0.144	2,796	403	1G	Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast	2	59	0.118	330	0.026	73
78	Women's RR	F82EE	1x8 Rec Troffer	2	1x8, 2 lamp 60 watt, recessed, (11.5)	1	123	0.123	2,796	344		Retrofit	F42ILL		2	2 F32T8/741 lamps, 1 std watt 2 lamp electronic ballast, conversion kit	1	59	0.059	165	0.064	179

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

Aloha Systems Measured Savings																						
14. DPSS GAIN Program Headquarters / DA Claims Unit																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
																Total T12-T8	367				19.156	46,839
9	Storage	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	2	60	0.120	780	94		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	2	19	0.038	30	0.082	64
13	Exterior	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	4	75	0.300	4,380	1,314		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	4	19	0.076	333	0.224	981
18	Entry area	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	3	75	0.225	4,380	986		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	3	19	0.057	250	0.168	736
30	Hall	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	2	75	0.150	4,380	657		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	2	19	0.038	166	0.112	491
32	Women's RR	I60/1	Globe	1	Globe, 60A lamp, ceiling mount	1	60	0.060	2,796	168		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	1	19	0.019	53	0.041	115
33	Closet	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	1	60	0.060	780	47		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32
35	Men's RR	I60/1	Globe	1	Globe, 60A lamp, ceiling mount	1	60	0.060	2,796	168		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	1	19	0.019	53	0.041	115
46	Computer lab storage	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	1	60	0.060	780	47		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32
57	Men's RR	I60/1	Globe	1	Globe, 60A lamp, ceiling mount	2	60	0.120	2,796	336		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	2	19	0.038	106	0.082	229
58	Exterior	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	2	75	0.150	4,380	657		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	2	19	0.038	166	0.112	491
65	Entry Area	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	6	75	0.450	4,380	1,971		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	6	19	0.114	499	0.336	1,472

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
74	Hall	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	2	75	0.150	4,380	657		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	2	19	0.038	166	0.112	491
76	Closet	I60/1	Keyless Socket	1	Keyless socket, 60A lamp, ceiling mount	1	60	0.060	780	47		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	1	19	0.019	15	0.041	32
79	Stairwell	I60/1	Jelly Jar	1	Jelly Jar, 60A lamp, wall mount, opal lens	3	60	0.180	4,380	788		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp	3	19	0.057	250	0.123	539
80	Stairwell	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	3	75	0.225	4,380	986		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	3	19	0.057	250	0.168	736

Aloha Systems Measured Savings
14. DPSS GAIN Program Headquarters / DA Claims Unit

		Existing Fixtures										New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
81	Exterior - Bldg perimeter	I75/1	Downlight	1	Downlight, 75 Par/Fl, recessed	38	75	2.850	4,380	12,483		Retrofit	CF18/1-SCRW		1	19 watt compact fluorescent lamp, R40 lens	38	19	0.722	3,162	2.128	9,321		
																Total INCAN	72				3.852	15,874		
Total						453		46.070		124,676			Total						453		22.705	58,835	23.365	65,840

DPSS Gain Program Headquarters – 3220 Rosemead Blvd.



Exit Sign – Gain Claims Office



Fixture – 2x4 Ballast Locations



Fixture – 2x4 Ballast Sample



Fixture – 2x4 Fixture Style



Gain Claims Office

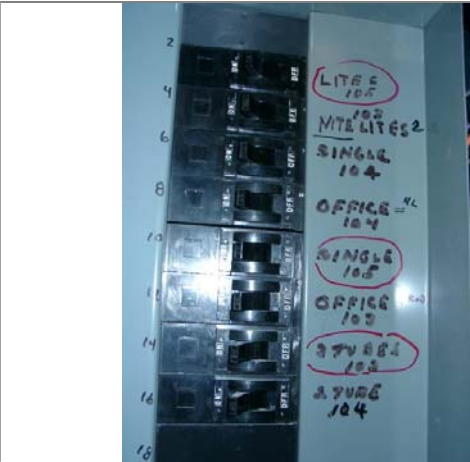


Gears Training Center

DPSS Gain Program Headquarters – 3220 Rosemead Blvd.



Lighting Panel With Data Logger



Panel Legend

Site Measurement and Verification Report

Site Number 15

Claremont Public Library
208 N. Harvard Ave., Claremont
SCE Account 3-001-4066-93

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	56,709 kWh
Contractor's As-Built Estimate	61,233 kWh
<i>Ex-Ante</i> Evaluation	82,776 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	60,078 kWh

Site Description

The library is a single story facility with a downstairs equipment room. It has a large main library, a children's library, offices, a downstairs mechanical room, various offices, and four study booths. Southern California Edison supplies the facility at 480Y/277 volts through meter PO726-001453. Its annual energy consumption in 2002 was 440,520 kWh, and its peak demand was 138 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The library is operational on Tuesday from 10:00 a.m. to 8:00 p.m. 9:00 a.m. to 8:00 p.m. on Wednesday and Thursday. 9:00 a.m. to 4:00 p.m. on Friday and Saturday. On Sunday the library is operational from 12:00 p.m. until 5:00 p.m.

Spreadsheet Errors

The spreadsheets were presented to us with direct values rather than formulas. Upon conversion to formulas, occasionally the rows did not multiply correctly and occasionally the rows did not add exactly to the reported total. Often this was the case when "no change" was reported because of the use of zero quantities. We corrected these problems by setting both the "existing" and "new" quantities to zero for any line item in which there were not fixtures changes. This will allow both the fixture and kWh sums to accurately represent the project. The purpose of the lighting spreadsheets is not to document every light in the facility, but rather to document only those that were retrofitted.

Changes made as a result of correcting the contractor's spreadsheet errors are highlighted in lavender on Aloha's "metered" spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor's as-built spreadsheet.

Preliminary Site Visit

The site was visited on March 5, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

Two discrepancies were discovered. The spreadsheet listed the lobby fixture light count as 160 when in reality there were 150. The spreadsheet also listed the lobby fixtures with electronic ballasts when in fact approximately 54% contained magnetic ballasts. The pre-retrofit fixture wattage was lowered to account for this observance. This change was highlighted in magenta.

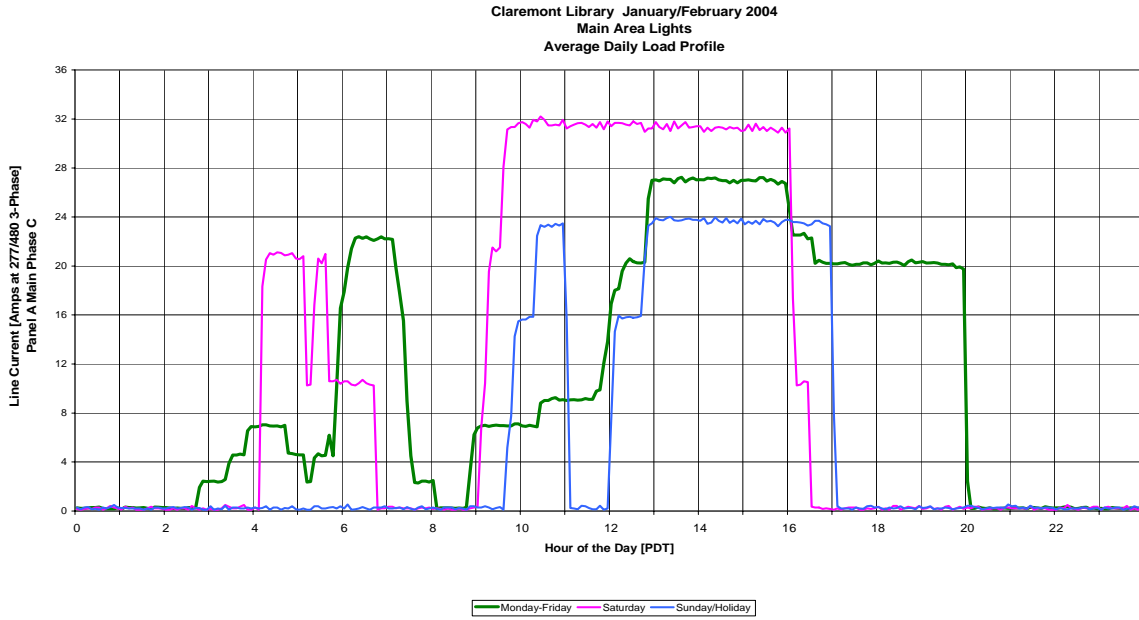
Post-Retrofit Audit

The site was again visited on January 15, 2003. We specifically re-verified the observations noted during the preliminary site visit. No discrepancies were noted and fixture counts were accurate.

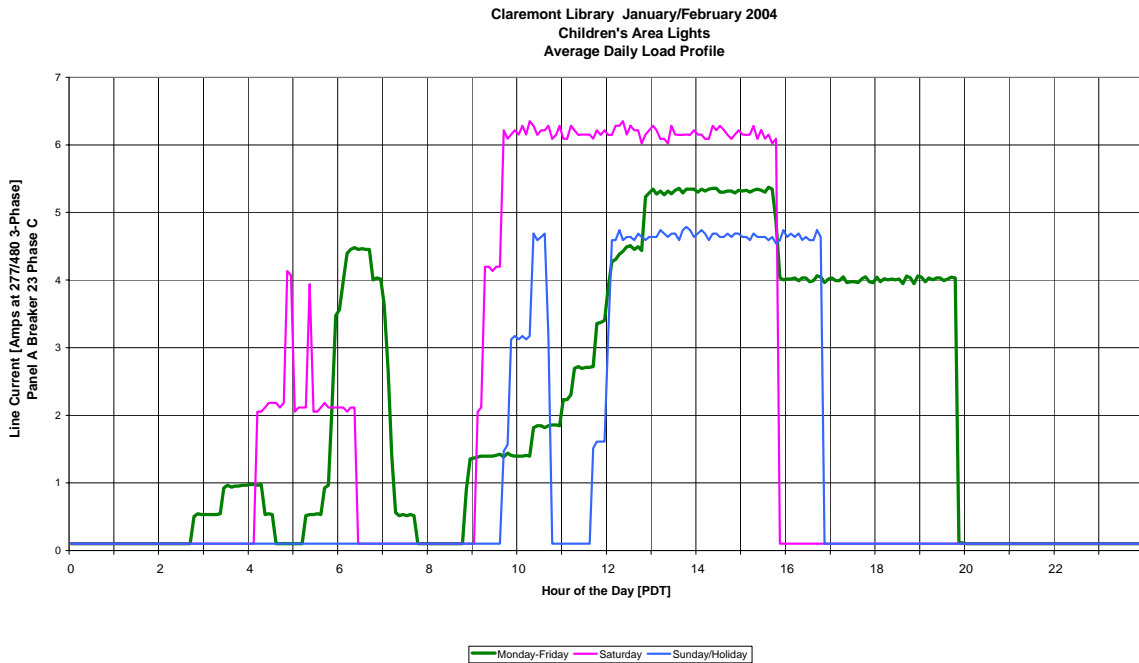
Metered Operating Hours

In order to verify operating hours of the facility, dataloggers were installed to collect data that can be used to verify the libraries hours of operation. The following load profiles depict the average daily operation of these areas.

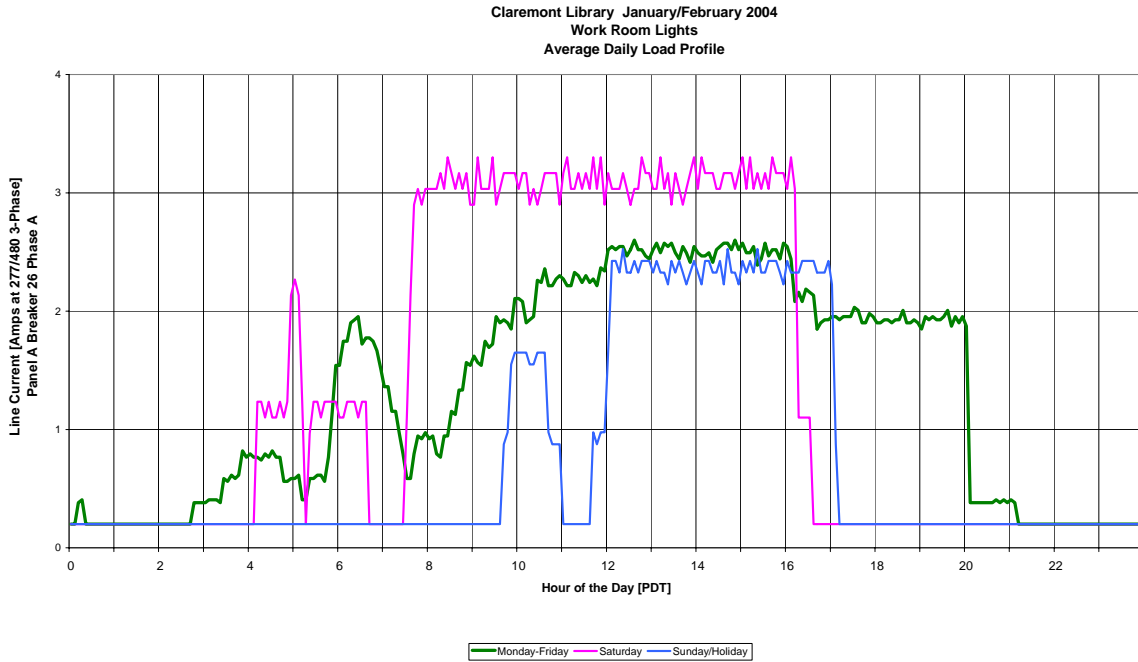
Main Area: The load profile below represents the main area/adult area of the library. This area is most active between 1:00 p.m. and 4:00 p.m. during the weekday. The profile also shows a load during the weekend attributed to the library's weekend hours. The full load equivalent operating hours are 2793 hours per year. The contractor as built full load equivalent operating hours was 2398 hours per year. The load is large for this monitored area.



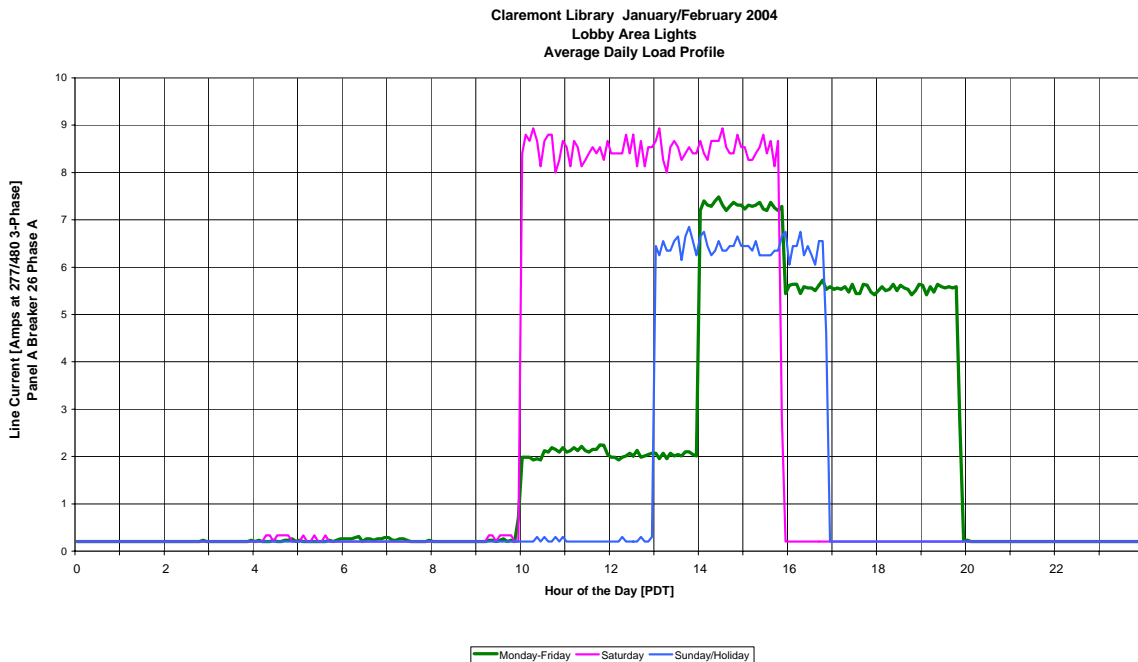
Children's Area: The load profile below represents the children's area lights. This area is most active in the afternoon. The graph also shows that the load is greater during the weekends due to Saturday hours. The full load equivalent operating hours are 2703 hours per year.



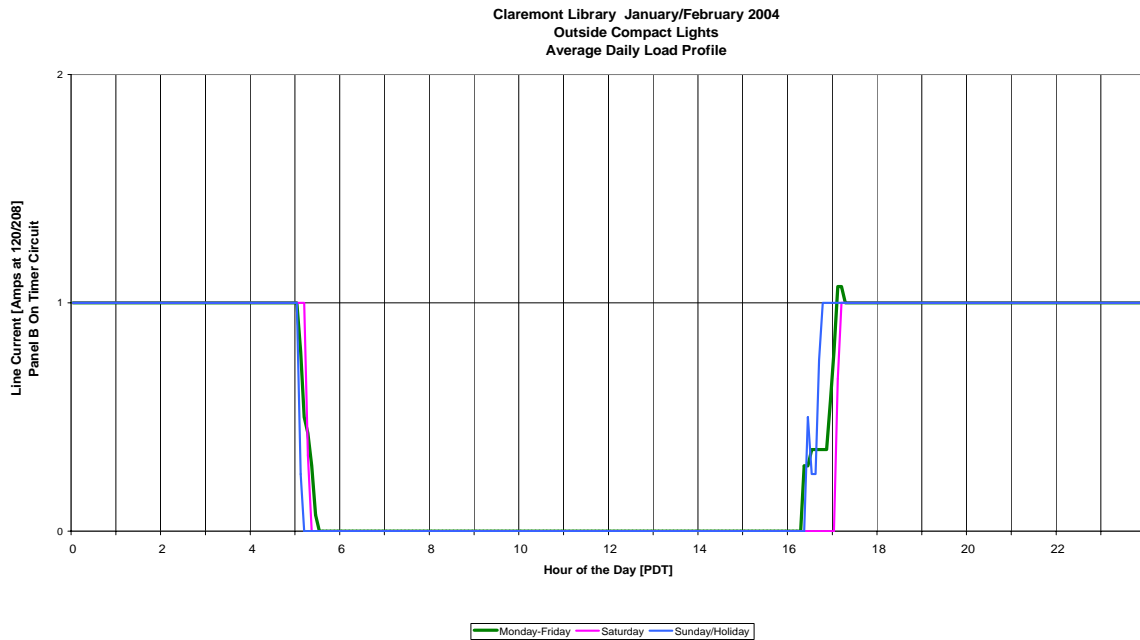
Work Room Area: The load profile below represents the work room area. This area is most active during the afternoon and again on Saturday due to library hours. The full load equivalent hours of operation are 3,487 hours per year. The contractor as built spreadsheet full load equivalent hours of operation is 2398 hours per year.



Lobby: The load profile below represents the lobby lights. These lights are most active between 2:00 p.m. and 8:00 p.m. and from 10:00 a.m. to 4:00 p.m. on Saturdays. The full load equivalent hours of operation are 1931 hours per year.



Outside Compact Fluorescents: The load profile below represents the compact fluorescent lights on the exterior of the building. These lights are on from about 5:00 p.m. until 5:00 a.m. During the day these lights are off. These compact fluorescents make up a small load. The full load equivalent operating hours are 4,545 hours per year, though the data were collected during January and the sloped sides of the profile shows photocell operation. We will use 4,380 hours per year to adjust for seasonal use. The operating hours claimed in the contractor as built spreadsheet are 4,745 hours per year.



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the

stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

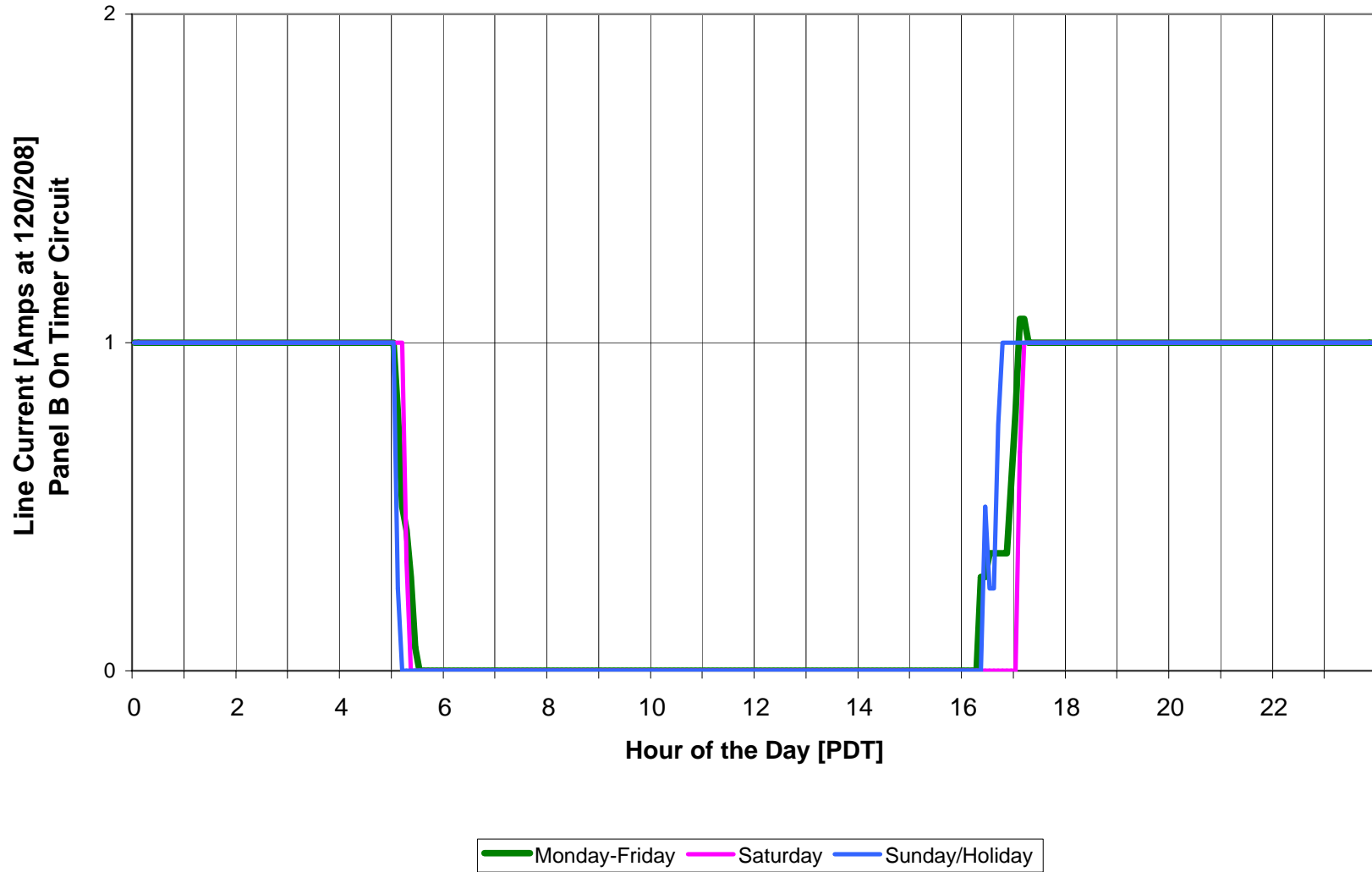
Claremont Public Library Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	9	2251	9	2,251	3,248	2,251
T12 to T8	444	48,800	436	47,815	75,266	49,934
Inc to CFL	34	5658	27	11,167	4,262	7,893
Total	497	56,709	472	61,233	82,776	60,078

The official *ex-ante* savings estimate for this site is higher than either the proposed, as-built, or *ex-post* estimates because the generic operating hours and fixture demand reduction values stipulated in the CPUC spreadsheet for all building sites are higher than those observed at this site. The *ex-ante* calculations, by definition, address only actual fixture quantities multiplied by average per-fixture savings estimates stipulated at the beginning of the program. The discrepancies between individual site *ex-ante* estimates and the county’s proposed savings arise from the fact that some sites have higher-than-average savings while some sites have lower-than-average savings.

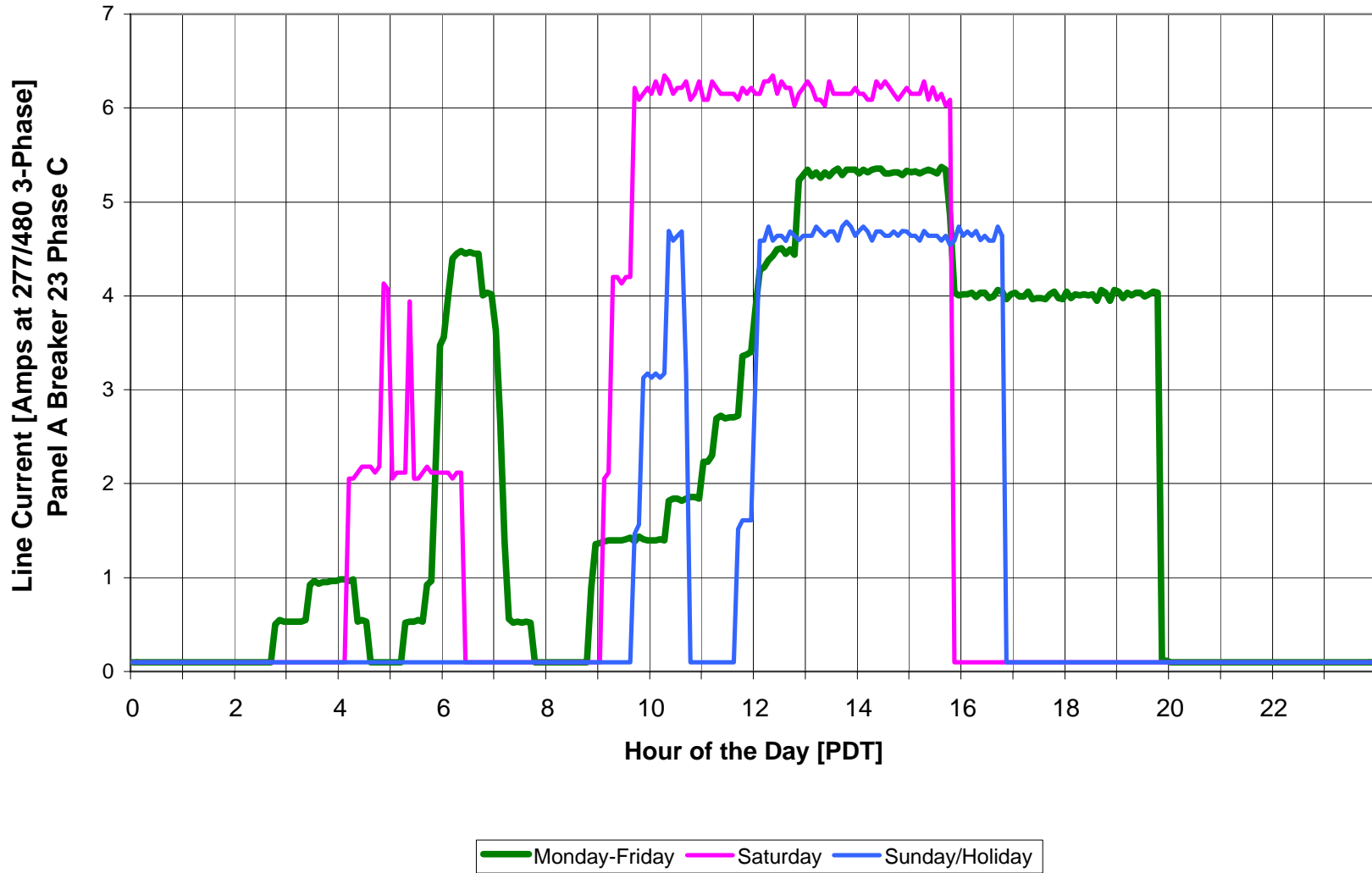
The county’s, contractor’s, and *ex-post* measured savings are similar because the originally assumed operating hours are similar to those verified by the metering.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

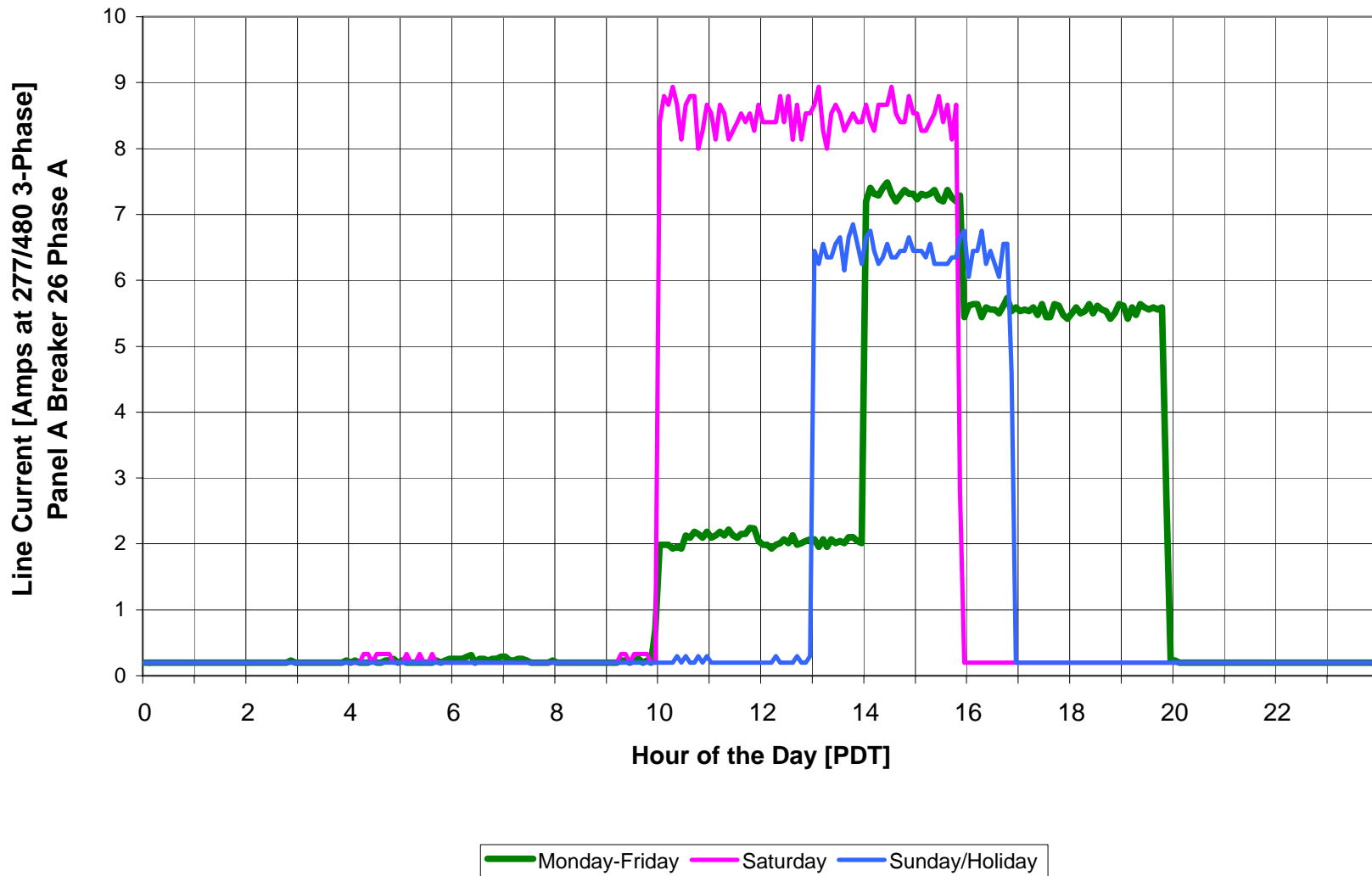
Claremont Library January/February 2004
Outside Compact Lights
Average Daily Load Profile



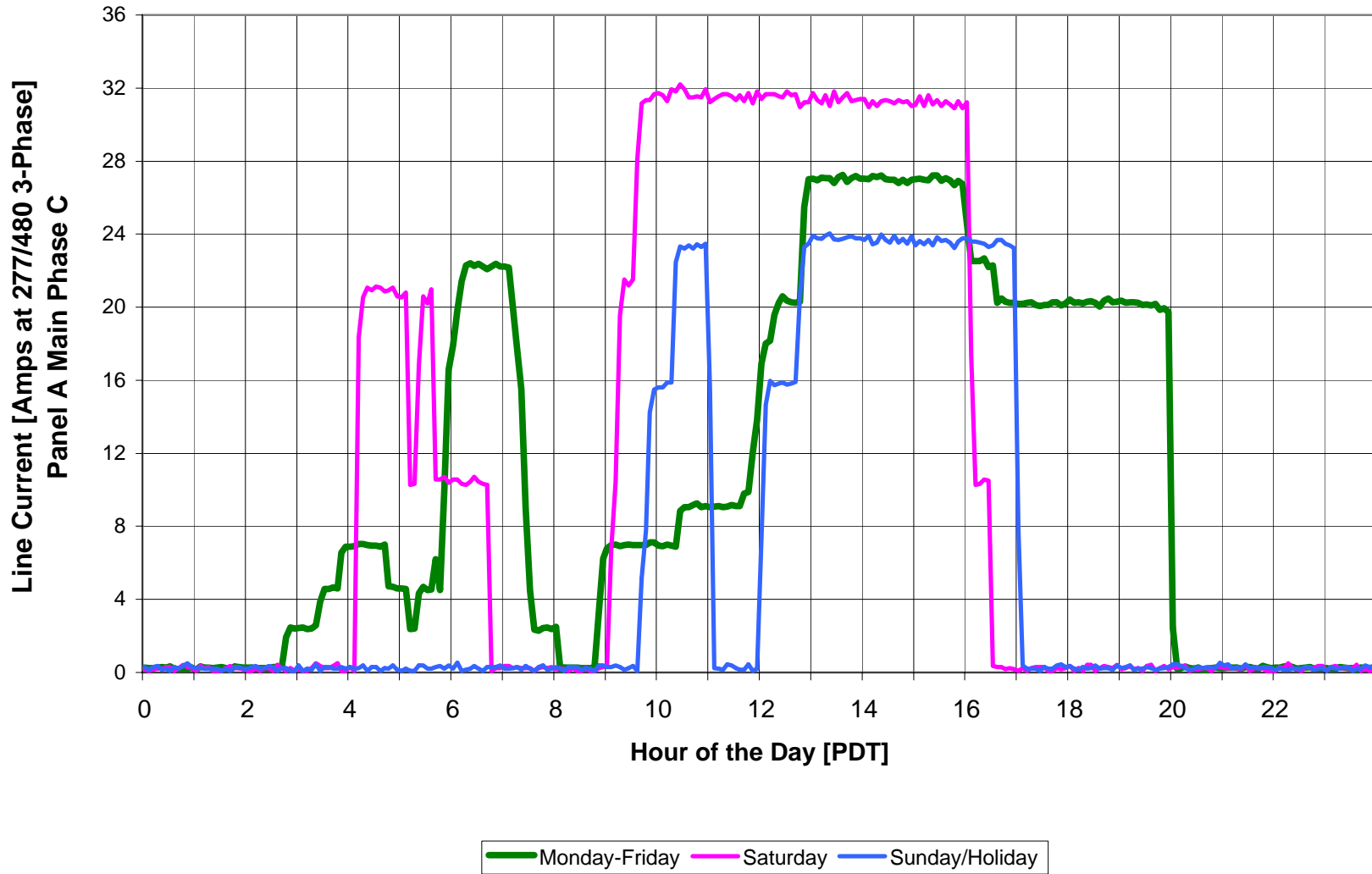
Claremont Library January/February 2004
Children's Area Lights
Average Daily Load Profile



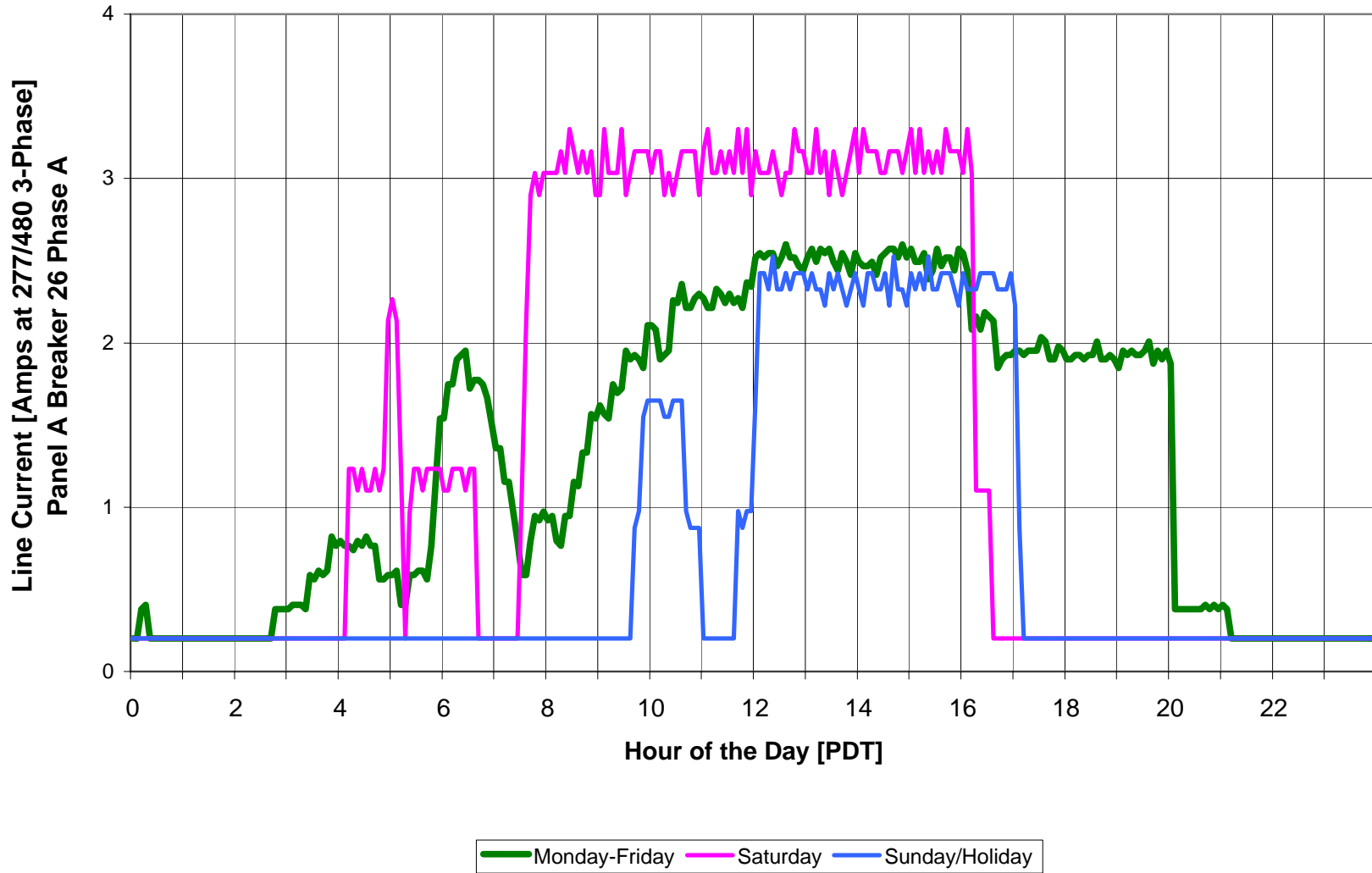
Claremont Library January/February 2004
Lobby Area Lights
Average Daily Load Profile



Claremont Library January/February 2004
Main Area Lights
Average Daily Load Profile



Claremont Library January/February 2004
Work Room Lights
Average Daily Load Profile



Contractor As-Built Savings
15. Claremont Public Library

Existing Fixtures																						New Fixtures							Savings	
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr								
46	EXTERIOR	MH70/1	HPS EXTERIOR	1	70W HIGH PRESSURE SODIUM	2	90	0.18	4,745	854		NO WORK			1	NO WORK	0	90	0.000	0	0.180	0								
42	EXTERIOR	MH175/1	MH EXTERIOR	1	175W METAL HALIDE	1	210	0.21	4,745	996		NO WORK			1	NO WORK	0	210	0.000	0	0.210	0								
28	Main Library	MH400/1	Hi-Bay	1	1 - 400w (?) Metal Halide	21	458	9.618	2,398	23,068		NO WORK			1	NO WORK	0	458	0.000	0	9.618	0								
																Total HID	0				10.008	0								
38	BACK ROOM AREA	EI14/2	EDGE LIT EXIT	2	2 - 14W T5	2	28	0.056	8,760	491		Retrofit	ECC		2	T1 - COLD CATHODE	2	7	0.014	123	0.042	368								
36	MULTI PURPOSE ROOM	EIN	NUKE EXIT	0	NUKE EXIT	2	0	0	8,760	0		NO WORK			0	NO WORK		0	0.000	0	0.000	0								
34	OPEN AREA	EI14/2	EDGE LIT EXIT	2	2 - 14W T5	3	28	0.084	8,760	736		Retrofit	ECC		2	T1 - COLD CATHODE	3	7	0.021	184	0.063	552								
31	Exit Lights	EXIT	Varies		Varies	4	40	0.16	8,760	1,402		Replace	ETP		2	NEW LED THERMOPLASTIC EXIT SIGN	4	2	0.008	70	0.152	1,331								
																Total Exits	9				0.257	2,251								
49	OPEN AREA	F44EE	1X4 WRAP	4	4 - 32W T8 1X4 WRAP	10	114	1.14	2,398	2,734		NO WORK			4	NO WORK		114	0.000	0	1.140	2,734								
48	MULTI PURPOSE ROOM	F48EE	4X4 RECESSED	8	8 - 34W T12 4X4 RECES	9	288	2.592	2398.44	6,217		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	9	200	1.800	4,317	0.792	1,900								

Contractor As-Built Savings
15. Claremont Public Library

Contractor As-Built Savings																						
15. Claremont Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
45	EXTERIOR	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	12	43	0.516	4,745	2,448		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	12	32	0.384	1,822	0.132	626
41	EXTERIOR	F42EE	INCA FIXTURE	1	2 - 34W T12 1X4 INDUST	11	90	0.99	4,745	4,697		Retrofit	F41ILL		1	2 - 32W T8 LAMPS, LOW POWER BALLAST	11	25	0.275	1,305	0.715	3,392
40	EXTERIOR	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	15	43	0.645	4,745	3,060		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	15	32	0.480	2,277	0.165	783
39	DISPLAY CASE	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	2	43	0.086	2,398	206		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	5	32	0.160	384	-0.074	-177
37	ROOM	F42EE	1X4 RECESSED	2	2 - 34W T12 1X4 RECES	2	72	0.144	2,398	345		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	245	0.042	101
35	OPEN AREA	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	6	43	0.258	2,398	619		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	0	32	0.000	0	0.258	619
30	Mechanical Room	F81EE	Strip	1	1 - F96T12ES	2	81	0.162	2,398	389		Retrofit	F81ILL		1	2 - 32W T8 LAMPS, LOW POWER BALLAST, CONVERSION KIT	2	51	0.102	245	0.060	144
29	Mechanical Room	F42EE	Industrial	2	2 - F40T12 ES	14	72	1.008	2,398	2,418		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	14	51	0.714	1,712	0.294	705
27	Main Library	F44EE	Wrap	4	4 - F40T12 ES	7	144	1.008	2,398	2,418		Retrofit	F44ILL		4	4 - 32W T8 LAMPS, LOW POWER BALLAST	7	100	0.700	1,679	0.308	739
26	Main Library	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	65	288	18.72	2,398	44,899		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	65	200	13.000	31,180	5.720	13,719
25	Study Booth 4	F41EE	1 x 4 Troffer	2	2 - F40T12 ES	4	72	0.288	2,398	691		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	0	51	0.000	0	0.288	691
24	Study Booth 3	F42EE	29	2	2 - F40T12 ES	4	72	0.288	2,398	691		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	245	0.186	446
23	Study Booth 2	F42EE	28	2	2 - F40T12 ES	4	72	0.288	2,398	691		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	1	51	0.051	122	0.237	568

Contractor As-Built Savings
15. Claremont Public Library

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
22	Study Booth 1	F42EE	27	2	2 - F40T12 ES	1	72	0.072	2,398	173		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	1	51	0.051	122	0.021	50
19	Mens Restroom	F41EE	1 x 4 Troffer	1	1 - F40T12 ES	1	43	0.043	2,398	103		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	1	32	0.032	77	0.011	26
18	Mens Restroom	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	4	72	0.288	2,398	691		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	4	51	0.204	489	0.084	201
17	Womens Restroom	F41EE	1 x 4 Troffer	1	1 - F40T12 ES	1	43	0.043	2,398	103		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	1	32	0.032	77	0.011	26
16	Womens Restroom	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	3	72	0.216	2,398	518		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	3	51	0.153	367	0.063	151
15	Entrance Reflected Ceiling	F41EE	Strip	1	1 - F40T12 ES	160	43	6.88	2,398	16,501		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	164	32	5.248	12,587	1.632	3,914
13	Volunteer Work Space	F44EE	2 x 4 Troffer	4	4 - F40T12 ES	4	144	0.576	2,398	1,382		Retrofit	F44ILL		4	4 - 32W T8 LAMPS, LOW POWER BALLAST	4	100	0.400	959	0.176	422
12	Staff Restroom	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	2	72	0.144	2,398	345		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	245	0.042	101
11	Work Room	F44EE	2 x 4 Troffer	4	4 - F40T12 ES	36	144	5.184	2,398	12,434		Retrofit	F44ILL		4	4 - 32W T8 LAMPS, LOW POWER BALLAST	36	100	3.600	8,634	1.584	3,799
10	Librarian Office	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	1	288	0.288	2,398	691		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	1	200	0.200	480	0.088	211
9	Check Out Area	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	3	288	0.864	2,398	2,072		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	3	200	0.600	1,439	0.264	633
8	Video Room	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	4	288	1.152	2,398	2,763		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	4	200	0.800	1,919	0.352	844
7	Professional Office	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	4	288	1.152	2,398	2,763		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	4	200	0.800	1,919	0.352	844

Contractor As-Built Savings
15. Claremont Public Library

Contractor As-Built Savings																						
15. Claremont Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
6	Custodian	F42EE	Industrial	2	2 - F40T12 ES	2	72	0.144	2,398	345		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	245	0.042	101
5	Break Room	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	4	288	1.152	2,398	2,763		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	4	200	0.800	1,919	0.352	844
4	Kitchen	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	1	72	0.072	2,398	173		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	1	51	0.051	122	0.021	50
3	Childrens Library	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	20	72	1.44	2,398	3,454		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	20	51	1.020	2,446	0.420	1,007
2	Childrens Library	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	36	288	10.368	2,398	24,867		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	36	200	7.200	17,269	3.168	7,598
1	Meeting Room	F44EE	4 x 4 Troffer	4	4 - F40T12 ES	0	-	-	-	-	-	-			-	-		-	-	-	-	-
																Total T12-T8	436				18.946	47,815
44	EXTERIOR	I100/1	INCA FIXTURE	1	1 - 100W INCA	20	100	2	4,745	9,489		Retrofit	CFQ23/1-L		1	23W COMPACT FLUORESCENT SCREW-IN	0	25	0.000	0	2.000	9,489
43	EXTERIOR	I30/1	QUARTZ FIXTURE	1	1 - 30W QUARTZ	1	30	0.03	4,745	142		NO WORK			1	NO WORK		30	0.000	0	0.030	142
33	OPEN AREA	I90/1	INCA FIXTURE	1	90W PAR38	6	90	0.54	2,398	1,295		Retrofit	CFQ23/1-L		1	23W COMPACT FLUORESCENT SCREW-IN w/reflector	4	25	0.100	240	0.440	1,055
32	Exterior	I150/1	Wall Mounted	1	1 - 150w Par 38	0	-	-	-	-	-	-			-	-		-	-	-	-	-
21	Book Drop	I60/1	Keyless	1	1 - 60w A	1	65	0.065	2,398	156		Retrofit	CFQ18/1-L		1	18W COMPACT FLUORESCENT SCREW-IN	1	20	0.020	48	0.045	108

Contractor As-Built Savings
15. Claremont Public Library

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
20	Custodian	I75/1	NO ACCESS		1 - 75w A	1	75	0.075	2,398	180		Retrofit	CFQ18/1-L		1	18W COMPACT FLUORESCENT SCREW IN	1	20	0.020	48	0.055	132
14	Book Drop	I100/1	Keyless	1	1 - 100w A	1	100	0.1	2,398	240		Retrofit	CF18/1-L		1	18W COMPACT FLUORESCENT SCREW IN	0	20	0.000	0	0.100	240
																Total INCAN	6				2.670	11,167
47	HIGH VOLTAGE ROOM	-	NO ENTRY	0	NO ACCESS	0	0	0	0	0		NO WORK			0	NO WORK		0	0.000	0	0.000	0
Total						519		71.329		183,712			Total						451		31.881	61,233

Aloha Systems Measured Savings
15. Claremont Public Library

Aloha Systems Measured Savings 15. Claremont Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
46	EXTERIOR	MH70/1	HPS EXTERIOR	1	70W HIGH PRESSURE SODIUM	0	90	0	4,745	0		NO WORK			1	NO WORK	0	90	0.000	0	0.000	0
42	EXTERIOR	MH175/1	MH EXTERIOR	1	175W METAL HALIDE	0	210	0	4,745	0		NO WORK			1	NO WORK	0	210	0.000	0	0.000	0
28	Main Library	MH400/1	Hi-Bay	1	1 - 400w (?) Metal Halide	0	458	0	2,398	0		NO WORK			1	NO WORK	0	458	0.000	0	0.000	0
																Total HID	0				0.000	0
38	BACK ROOM AREA	EI14/2	EDGEKIT EXIT	2	2 - 14W T5	2	28	0.056	8,760	491		Retrofit	ECC		2	T1 - COLD CATHODE	2	7	0.014	123	0.042	368
36	MULTI PURPOSE ROOM	EIN	NUKE EXIT	0	NUKE EXIT	0	0	0	8,760	0		NO WORK			0	NO WORK	0	0	0.000	0	0.000	0
34	OPEN AREA	EI14/2	EDGEKIT EXIT	2	2 - 14W T5	3	28	0.084	8,760	736		Retrofit	ECC		2	T1 - COLD CATHODE	3	7	0.021	184	0.063	552
31	Exit Lights	EXIT	Varies		Varies	4	40	0.16	8,760	1,402		Replace	ETP		2	NEW LED THERMOPLASTIC EXIT SIGN	4	2	0.008	70	0.152	1,331
																Total	9				0.257	2,251
49	OPEN AREA	F44EE	1X4 WRAP	4	4 - 32W T8 1X4 WRAP	0	114	0	2,398	0		NO WORK			4	NO WORK	0	114	0.000	0	0.000	0
48	MULTI PURPOSE ROOM	F48EE	4X4 RECESSED	8	8 - 34W T12 4X4 RECES	9	288	2.592	2398	6,216		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	9	200	1.800	4,316	0.792	1,899

Aloha Systems Measured Savings
15. Claremont Public Library

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
45	EXTERIOR	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	12	43	0.516	4,545	2,345		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	12	32	0.384	1,745	0.132	600
41	EXTERIOR	F42EE	INCA FIXTURE	1	2 - 34W T12 1X4 INDUST	11	90	0.99	4,545	4,500		Retrofit	F41ILL		1	2 - 32W T8 LAMPS, LOW POWER BALLAST	11	25	0.275	1,250	0.715	3,250
40	EXTERIOR	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	15	43	0.645	4,545	2,932		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	15	32	0.480	2,182	0.165	750
39	DISPLAY CASE	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	2	43	0.086	2,793	240		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	5	32	0.160	447	-0.074	-207
37	ROOM	F42EE	1X4 RECESSED	2	2 - 34W T12 1X4 RECES	2	72	0.144	2,793	402		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	285	0.042	117
35	OPEN AREA	F41EE	1X4 STRIP	1	1 - 34W T12 1X4 STRIP	6	43	0.258	2,793	721		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	0	32	0.000	0	0.258	721
30	Mechanical Room	F81EE	Strip	1	1 - F96T12ES	2	81	0.162	520	84		Retrofit	F81ILL		1	2 - 32W T8 LAMPS, LOW POWER BALLAST, CONVERSION KIT	2	51	0.102	53	0.060	31
29	Mechanical Room	F42EE	Industrial	2	2 - F40T12 ES	14	72	1.008	520	524		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	14	51	0.714	371	0.294	153
27	Main Library	F44EE	Wrap	4	4 - F40T12 ES	7	144	1.008	2,793	2,815		Retrofit	F44ILL		4	4 - 32W T8 LAMPS, LOW POWER BALLAST	7	100	0.700	1,955	0.308	860
26	Main Library	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	65	288	18.72	2,793	52,285		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	65	200	13.000	36,309	5.720	15,976
25	Study Booth 4	F41EE	1 x 4 Troffer	2	2 - F40T12 ES	4	72	0.288	2,793	804		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	0	51	0.000	0	0.288	804
24	Study Booth 3	F42EE	29	2	2 - F40T12 ES	4	72	0.288	2,793	804		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	285	0.186	519
23	Study Booth 2	F42EE	28	2	2 - F40T12 ES	4	72	0.288	2,793	804		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	1	51	0.051	142	0.237	662

Aloha Systems Measured Savings
15. Claremont Public Library

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
22	Study Booth 1	F42EE	27	2	2 - F40T12 ES	1	72	0.072	2,793	201		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	1	51	0.051	142	0.021	59
19	Mens Restroom	F41EE	1 x 4 Troffer	1	1 - F40T12 ES	1	43	0.043	2,793	120		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	1	32	0.032	89	0.011	31
18	Mens Restroom	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	4	72	0.288	2,793	804		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	4	51	0.204	570	0.084	235
17	Womens Restroom	F41EE	1 x 4 Troffer	1	1 - F40T12 ES	1	43	0.043	2,793	120		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	1	32	0.032	89	0.011	31
16	Womens Restroom	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	3	72	0.216	2,793	603		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	3	51	0.153	427	0.063	176
15	Entrance Reflected Ceiling	F41EL - F41EE	Strip	1	1 - F40T12 ES	160	39	6.2176	2,793	17,366		Retrofit	F41ILL		1	1 - 32W T8 LAMPS, LOW POWER BALLAST	164	32	5.248	14,658	0.970	2,708
13	Volunteer Work Space	F44EE	2 x 4 Troffer	4	4 - F40T12 ES	4	144	0.576	3,487	2,009		Retrofit	F44ILL		4	4 - 32W T8 LAMPS, LOW POWER BALLAST	4	100	0.400	1,395	0.176	614
12	Staff Restroom	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	2	72	0.144	3,487	502		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	356	0.042	146
11	Work Room	F44EE	2 x 4 Troffer	4	4 - F40T12 ES	36	144	5.184	3,487	18,077		Retrofit	F44ILL		4	4 - 32W T8 LAMPS, LOW POWER BALLAST	36	100	3.600	12,553	1.584	5,523
10	Librarian Office	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	1	288	0.288	3,487	1,004		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	1	200	0.200	697	0.088	307
9	Check Out Area	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	3	288	0.864	2,793	2,413		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	3	200	0.600	1,676	0.264	737
8	Video Room	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	4	288	1.152	2,793	3,218		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	4	200	0.800	2,234	0.352	983
7	Professional Office	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	4	288	1.152	3,487	4,017		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	4	200	0.800	2,790	0.352	1,227

Aloha Systems Measured Savings
15. Claremont Public Library

Aloha Systems Measured Savings 15. Claremont Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
6	Custodian	F42EE	Industrial	2	2 - F40T12 ES	2	72	0.144	520	75		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	2	51	0.102	53	0.042	22
5	Break Room	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	4	288	1.152	3,487	4,017		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	4	200	0.800	2,790	0.352	1,227
4	Kitchen	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	1	72	0.072	3,487	251		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	1	51	0.051	178	0.021	73
3	Childrens Library	F42EE	1 x 4 Troffer	2	2 - F40T12 ES	20	72	1.44	2,703	3,892		Retrofit	F42ILL		2	2 - 32W T8 LAMPS, LOW POWER BALLAST	20	51	1.020	2,757	0.420	1,135
2	Childrens Library	F48EE	4 x 4 Troffer	8	8 - F40T12 ES	36	288	10.368	2,703	28,025		Retrofit	F48ILL		8	8 - 32W T8 LAMPS, LOW POWER BALLAST	36	200	7.200	19,462	3.168	8,563
1	Meeting Room	F44EE	4 x 4 Troffer	4	4 - F40T12 ES	0	-		-			-	-	-	-	-	-	-	-	-	-	-
																Total T12-T8	436				17.144	49,934
44	EXTERIOR	I100/1	INCA FIXTURE	1	1 - 100W INCA	20	100	2	4,380	8,760		Retrofit	CFQ23/1-L		1	23W COMPACT FLUORESCENT SCREW-IN	20	25	0.500	2,190	1.500	6,570
43	EXTERIOR	I30/1	QUARTZ FIXTURE	1	1 - 30W QUARTZ	0	30	0	4,380	0		NO WORK			1	NO WORK	0	30	0.000	0	0.000	0
33	OPEN AREA	I90/1	INCA FIXTURE	1	90W PAR38	6	90	0.54	2,793	1,508		Retrofit	CFQ23/1-L		1	23W COMPACT FLUORESCENT SCREW-IN w/reflector	4	25	0.100	279	0.440	1,229
32	Exterior	I150/1	Wall Mounted	1	1 - 150w Par 38	0	-		-			-	-	-	-	-	-	-	-	-	-	-
21	Book Drop	I60/1	Keyless	1	1 - 60w A	1	65	0.065	520	34		Retrofit	CFQ18/1-L		1	18W COMPACT FLUORESCENT SCREW-IN	1	20	0.020	10	0.045	23

Aloha Systems Measured Savings
15. Claremont Public Library

		Existing Fixtures										New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
20	Custodian	I75/1	NO ACCESS		1 - 75w A	1	75	0.075	520	39		Retrofit	CFQ18/1-L		1	18W COMPACT FLUORESCENT SCREW IN	1	20	0.020	10	0.055	29		
14	Book Drop	I100/1	Keyless	1	1 - 100w A	1	100	0.1	520	52		Retrofit	CF18/1-L		1	18W COMPACT FLUORESCENT SCREW IN	1	20	0.020	10	0.080	42		
																Total INCAN	27				2.120	7,893		
47	HIGH VOLTAGE ROOM	-	NO ENTRY	0	NO ACCESS	0	0	0	0	0		NO WORK			0	NO WORK		0	0.000	0	0.000	0		
Total						519		59.4886		175,212			Total						472		39.968	115,134	19.521	60,078

Claremont Library – 208 North Harvard Avenue



Claremont Library Front



Claremont Library Main Entrance



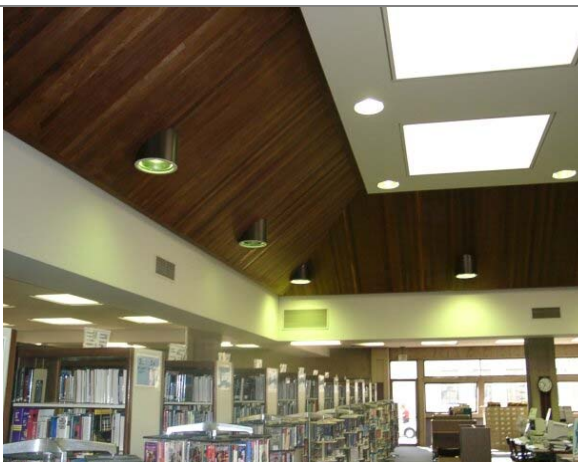
Outdoor 1 x 4 Strip Fixtures, By Entrances



Lobby Lighting, 1 x 4 Mixed Ballast Fixtures

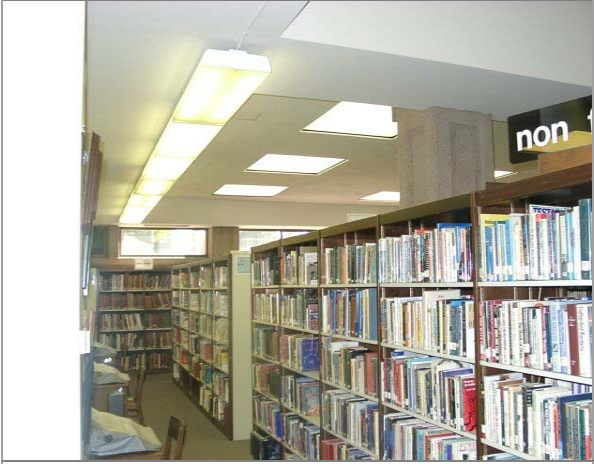


Main Library 4 x 4, 8-lamp Fixtures



400-watt HID Fixtures In The Main Library

Claremont Library – 208 North Harvard Avenue



2 x 4 Surface Mounted Fixtures, Main Library



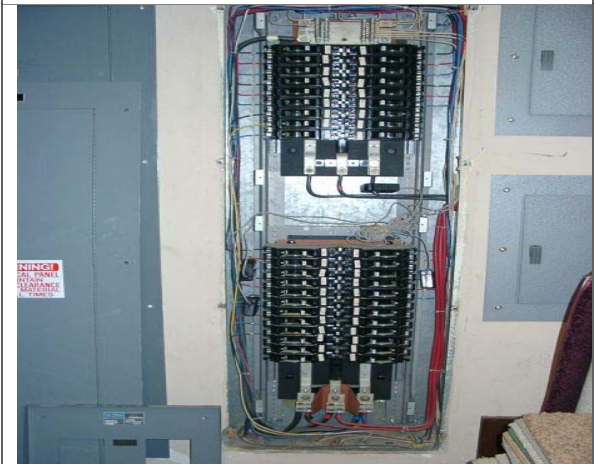
2 x 4 Troffers In The Work Room



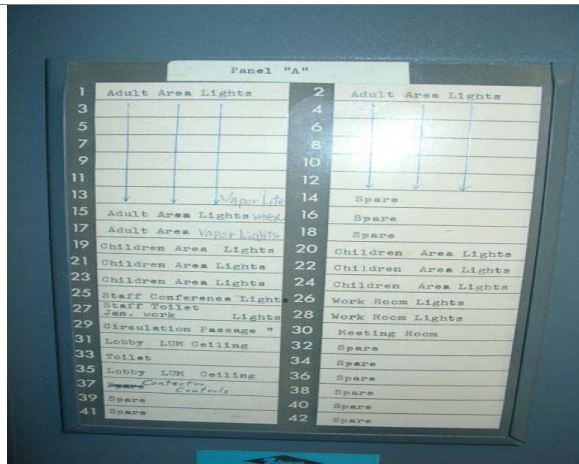
Children's Library, 4 x 4, 8-lamp Fixtures



Auditorium



Panel A With Data Loggers



Panel A Legend

Claremont Library – 208 North Harvard Avenue



Contactor that feeds top half of panel A



Contactor for children's area



Contactor that feeds top half of panel A

Panel "B"	
1	Entry Vest. Lights
2	Outside Floods
3	East Entry outside
4	Outside Flood
5	West Entry Outside
6	Outside Flood
7	West Entry Outside
8	Receptacle work Des & Librarian, Conf. work room
9	Outside Stairs Lights
10	Librarian, Conf. work room Recepts
11	Storage Lights
12	Librarian, Conf. work room Recepts
13	Staff Rooms, Conf Recept
14	Storage Room, POLE Meeting Room Recepts
15	Staff Room Recepts
16	Storage Meeting room Recepts
17	Conference Recepts
18	Screen
19	Childrens Area Ground Meeting Recepts
20	Typing Adult Recepts
21	Childrens Area Recepts
22	Typing Adult Recepts
23	Childrens Area Recepts
24	Typing Adult Recepts
25	Refrigerator
26	Electric Drinking
27	Garbage Disposal EX. PHN
28	Kitchen Staff Room
29	Staff Room Recepts
30	Kitchen Staff Room
31	Door Operators
32	Dwyer Unit
33	Refrigerator
34	Dwyer Unit
35	Garbage Disposal
36	Communications
37	Spare
38	Time Clock Controls
39	Spare
40	MCS Computer OUTSIDE COUNTER
41	Spare (not detection) 11/25 05/05
42	MCS Computer OUTSIDE WORK ROOM

Contactor for children's area



Panel B Timer

Site Measurement and Verification Report

Site Number 16

West Covina Public Library
1601 W. Covina Pkwy, West Covina
SCE Account 3-000-2452-66

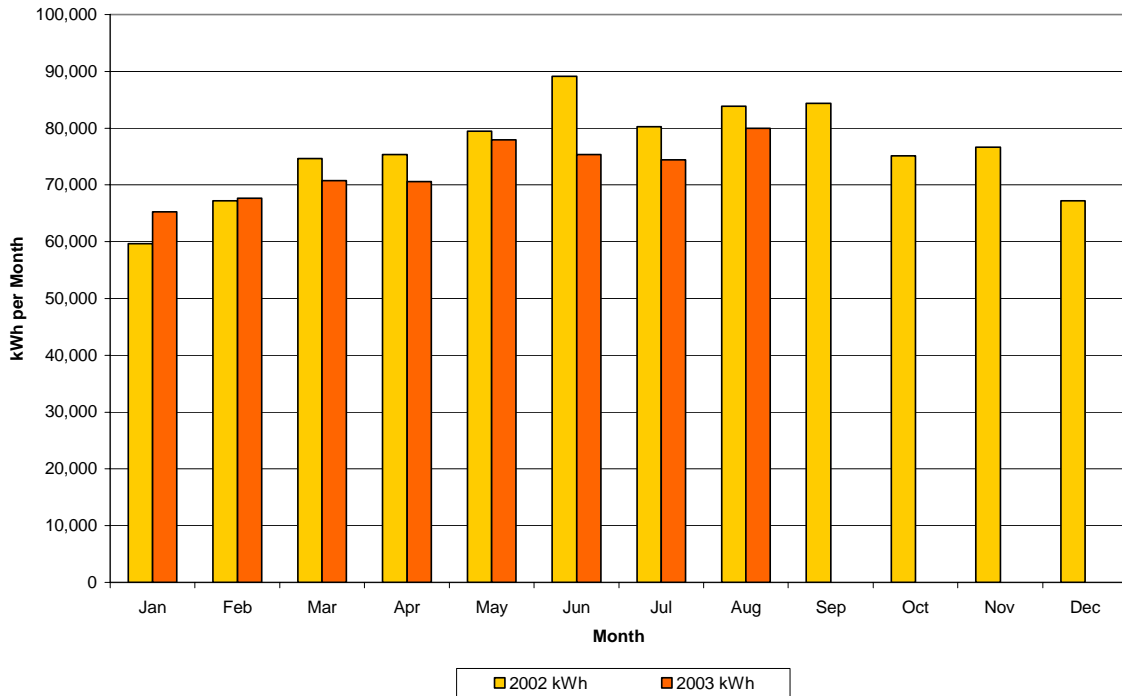
Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	155,360 kWh
Contractor's As-Built Estimate	156,922 kWh
<i>Ex-Ante</i> Evaluation	139,801 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	153,753 kWh

Site Description

This library is a two-story facility with upstairs children's reading and activities room. It has a large main library, a children's library, various offices, a computer room, and booths. Southern California Edison supplies the facility at 480Y/277 volts through meter V349E-001392. Its annual energy consumption in 2002 was 912,922 kWh, and its peak demand was 262 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The facility is operational Monday through Wednesday from 10:00 a.m. to 8:00 p.m. Thursday hours are from 1:00 p.m. to 8:00 p.m. Friday and Saturday hours are from 10:00 a.m. to 5:00 p.m.

West Covina Library



Spreadsheet Errors

Changes made as a result of correcting the contractor's spreadsheet errors are highlighted in lavender on Aloha's "metered" spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor's as-built spreadsheet.

Preliminary Site Visit

The site was visited on May 1, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

One discrepancy was discovered. The spreadsheet listed the all the U-tube fixtures as containing magnetic ballasts when in fact they were electronic ballasts. Wattage changes were made on the spreadsheet and highlighted in pink.

Post-Retrofit Audit

The site was again visited on December 18, 2003. We specifically re-verified the observations noted during the preliminary site visit. Fixture count and type was accurate when compared with the spreadsheet.

Operating Hours:

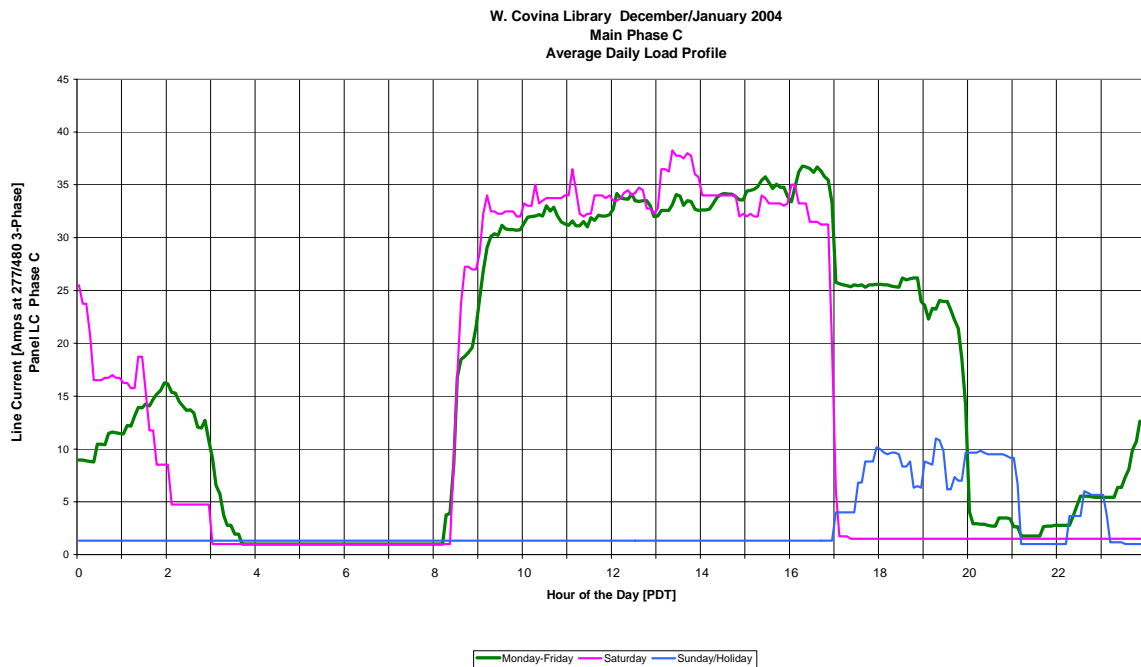
We obtained operating hours from the West Covina Library website. The library is closed on Sunday. On Monday through Wednesday the library hours are from 10:00 am to 8:00 pm. Thursday hours are from 1:00 am to 8:00 pm. Friday and Saturday hours are from 10:00 am to 5:00 pm. All lights were on at the time of our audit. The table below lists the operating hours of the library. Ignoring holidays, this amounts to 2,652 open hours per year.

Day of Week	Business Hours	Total hr/day
Monday	10:00 am – 8:00 pm	10
Tuesday	10:00 am – 8:00 pm	10
Wednesday	10:00 am – 8:00 pm	10
Thursday	1:00 pm – 8:00 pm	7
Friday	10:00 am – 5:00 pm	7
Saturday	10:00 am – 5:00 pm	7
Sunday	Closed	0
Total Hours/Week		51

Metered Operating Hours

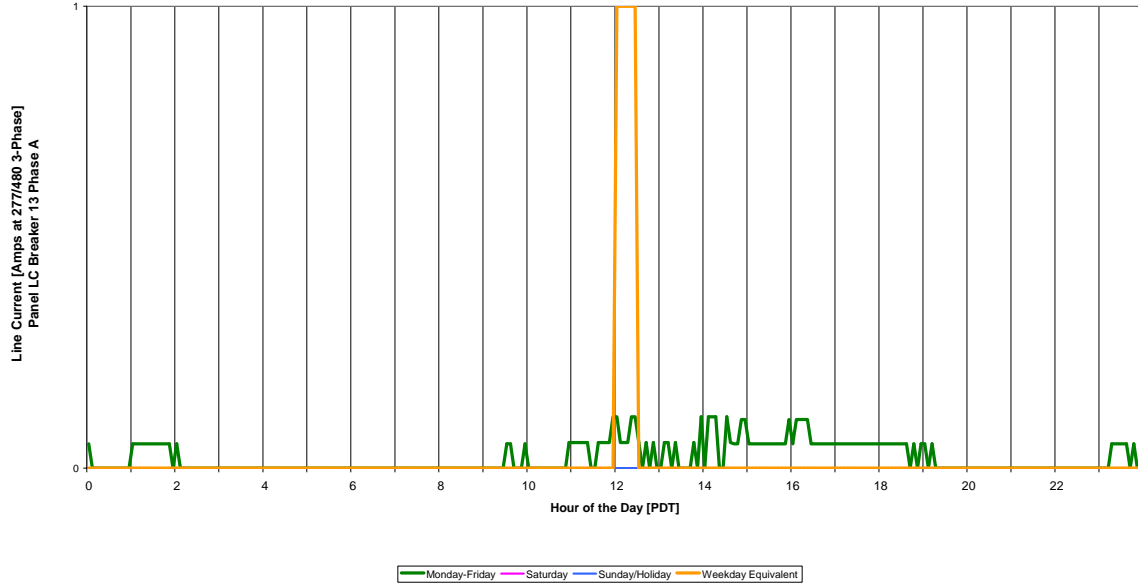
Dataloggers were installed at the library to verify hours of operation. The areas that were monitored include main area lights downstairs, meeting room, and the children’s reading room. The data collected included Christmas and New Years holiday, which has an important effect on the normal operating hours.

Panel LC Main Feeder: The following load profile represents the total current for the main C phase of lighting panel LC. This panel supplies all the lights in the library. The full load equivalent operating time is **3,110** hours per year.



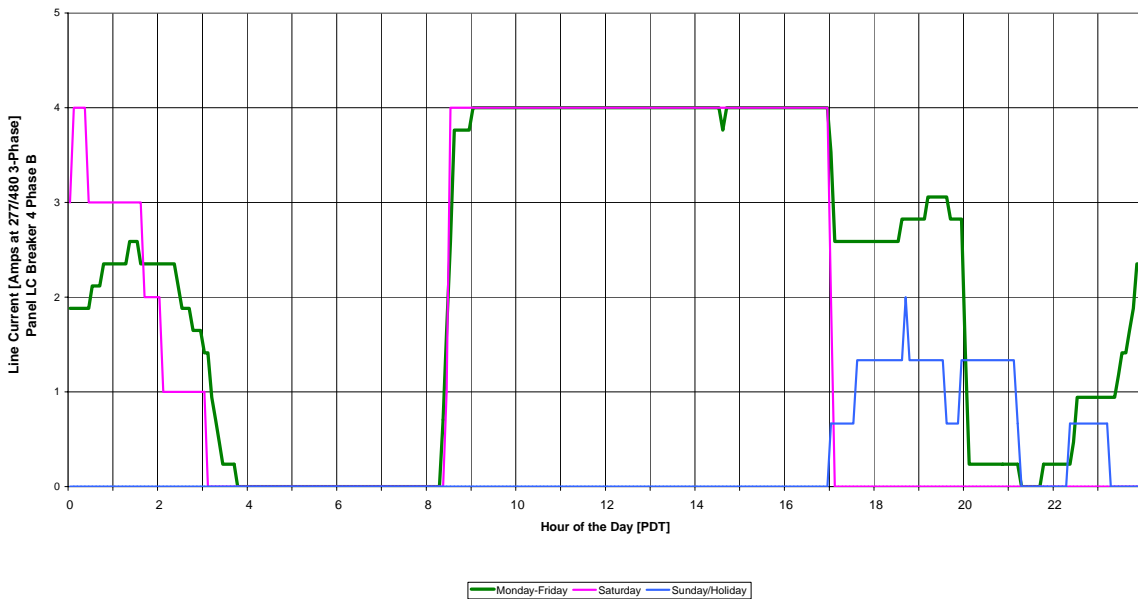
Meeting Room: The next load profile represents the meeting room lights. The load profile shows that the meeting room is barely in use, with a total of half an hour of operation per day. The full load operating time is 151 hours per year. The contractor's as-built spreadsheet has full load equivalent operating hours as 3744 hours per year.

W. Covina Library December/January 2004
Meeting Room Lights
Average Daily Load Profile

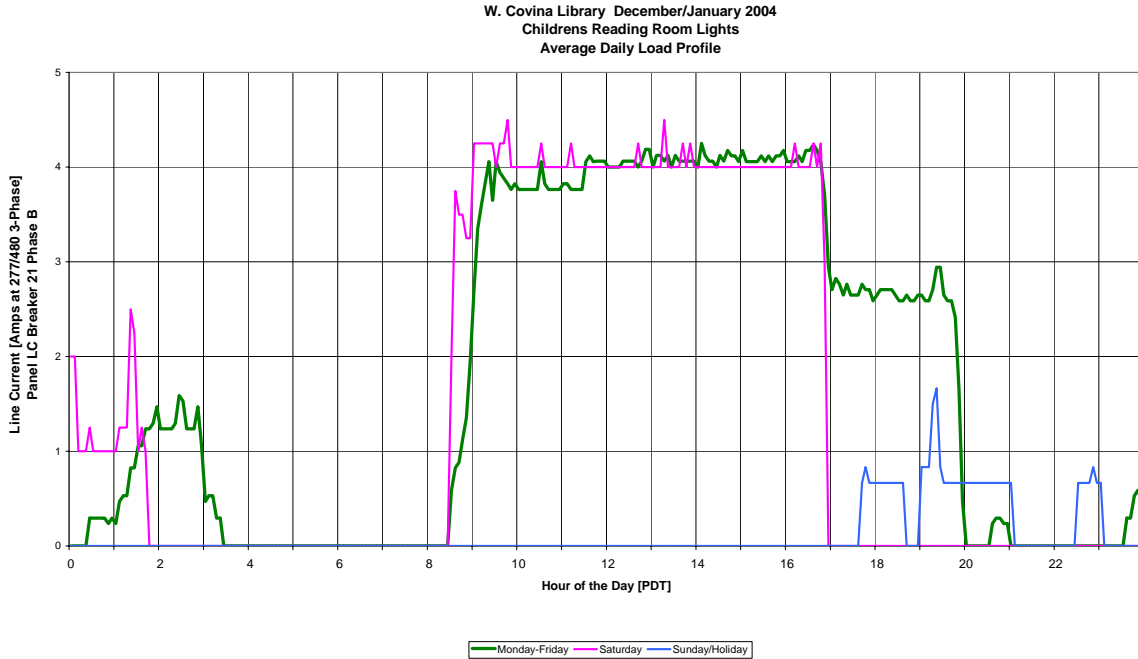


Main Area: The load profile below represents the main area lights downstairs. The full load equivalent operating time is 3,872 hours per year. The contractor as-built spreadsheet burn hours for this area are 3,744 hours per year.

W. Covina Library December/January 2004
Main Area Lights
Average Daily Load Profile



Children's Reading Room: The last load profile represents the lights in the children's reading room. The full load operating time for this area is 3,166 hours per year. This area is most active during the afternoon.



The equivalent operating time of the main circuit, which represents the demand-weighted average of all the lights in the library, is lower than the operating times of the main adult and children's lighting areas. This is to be expected because of the areas that are seldom used. The main reading area lights operate approximately 1,000 more hours than the library is open due to re-shelving and other activity. The children's area's operating times more closely resemble actual public open times.

There are some back-room work areas in which library personnel work when the library is closed and the main lights are not on. We estimate these areas to be lit 700 additional hours per year (approximately two hours per operating day), resulting in 4,270 hours per year. There are also some emergency lights that are known to operate continuously. These lights have been approximated by certain line items on the spreadsheet, as the main floor actually contains some of these lights. The existence of the emergency lights is demonstrated by the main feeder load profile, which never reaches zero.

Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor's spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor's spreadsheet was changed by more than 1% because of our metering, it was highlighted in gold. If a value in the contractor's spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow.

Numbers that were not changed from the contractor’s values were not highlighted. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

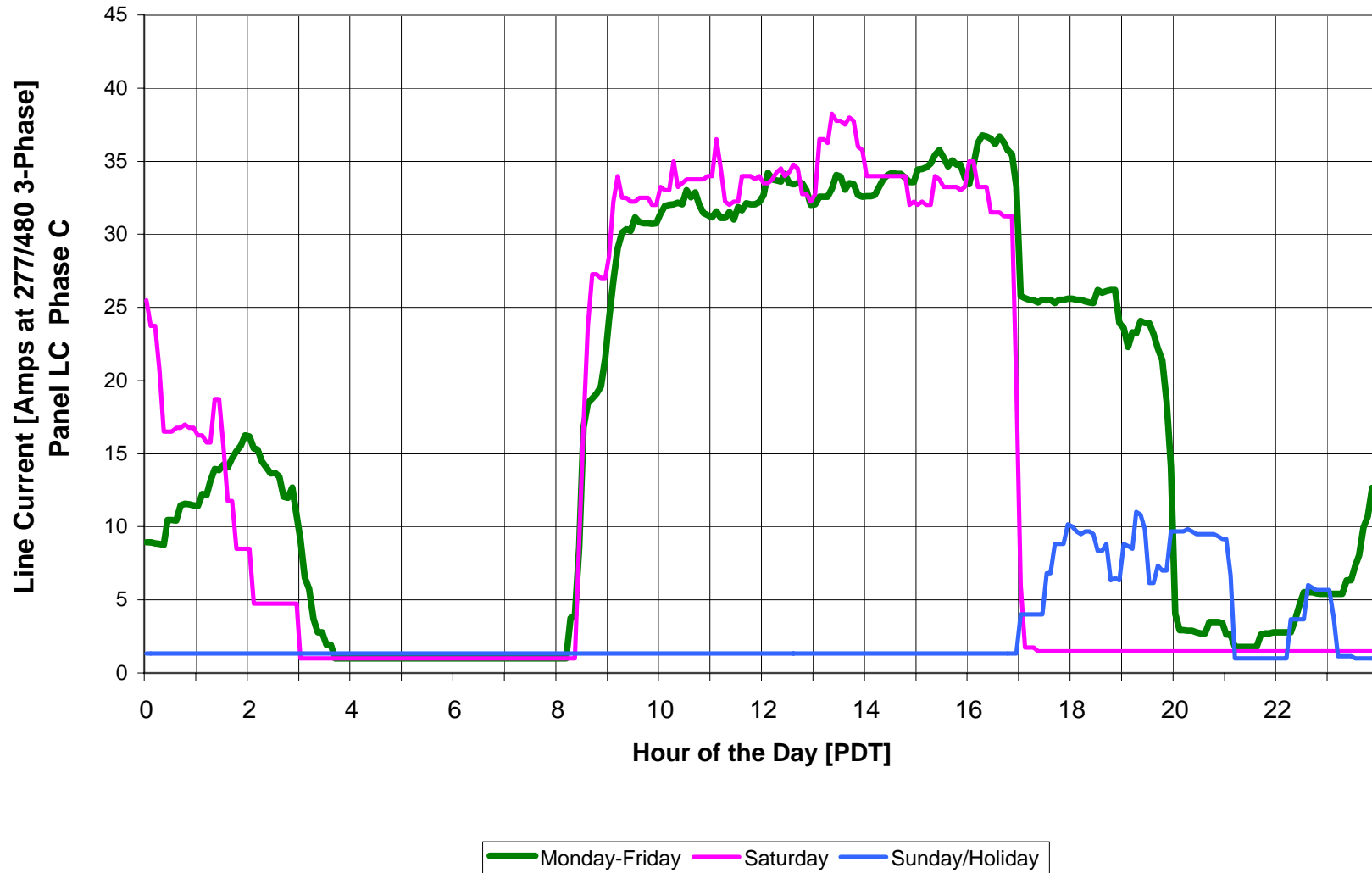
The following table delineates the savings at this site for each of the measure types included in the program.

West Covina Library Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	786	153,591	776	155,048	133,960	151,078
Inc to CFL	34	1,769	37	1,874	5,841	1,874
Total	820	155,360	813	156,922	139,801	153,753

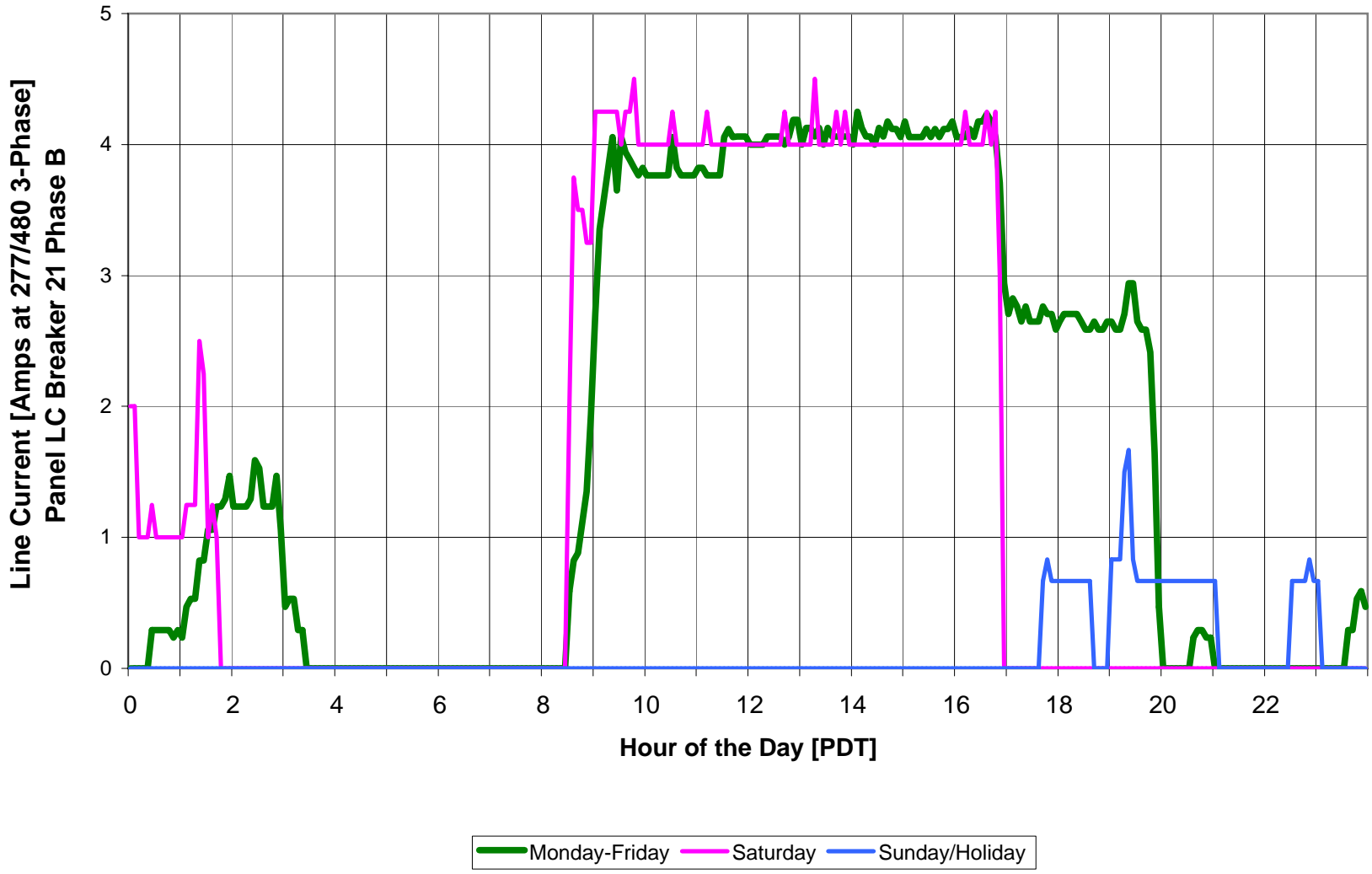
The *ex-ante* savings estimate is lower than the other values because the library had many 4-lamp fixtures, which have an watt reduction per fixture higher than the program-wide average assumed in the CPUC spreadsheet. The *ex-post* savings is slightly lower than the contractor’s estimate because the metered hours were in general slightly less than the contractor’s estimate of operating hours.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

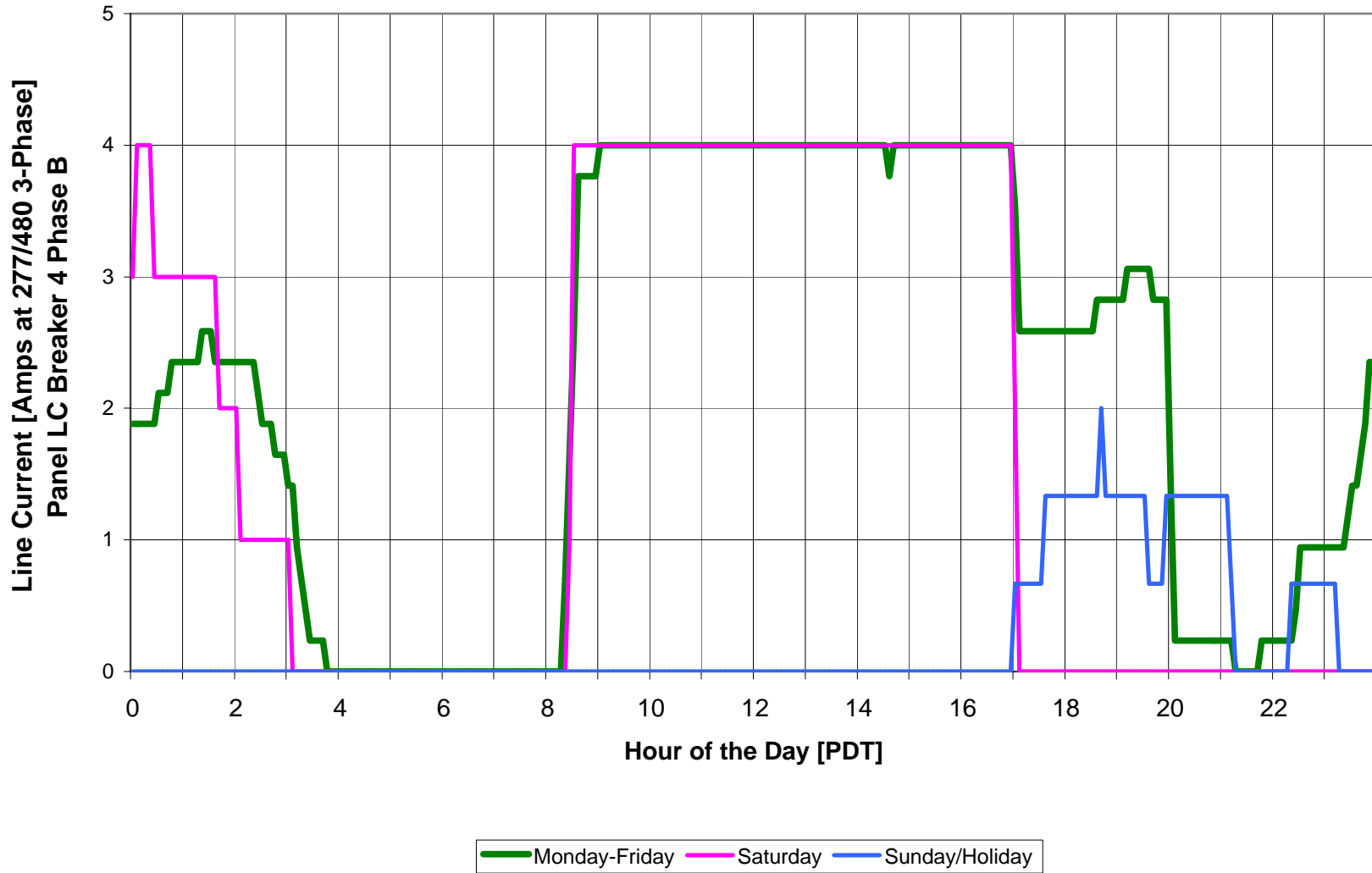
W. Covina Library December/January 2004
Main Phase C
Average Daily Load Profile



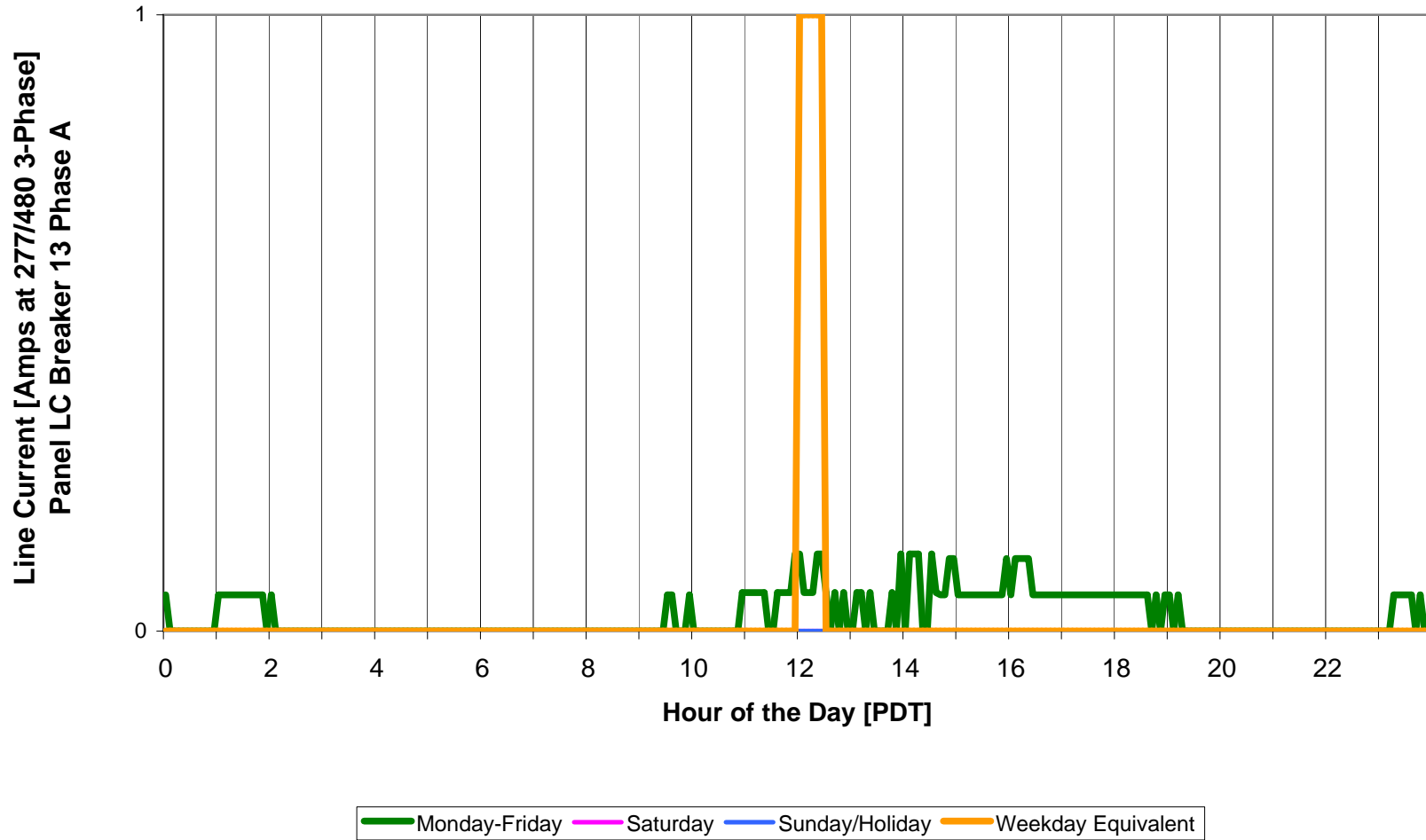
W. Covina Library December/January 2004
Childrens Reading Room Lights
Average Daily Load Profile



W. Covina Library December/January 2004
Main Area Lights
Average Daily Load Profile



W. Covina Library December/January 2004
Meeting Room Lights
Average Daily Load Profile



Contractor As-Built Savings
16. West Covina Public Library

Contractor As-Built Savings 16. West Covina Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
3	Regional Office Main area	F44EE	Troffer	4	2 x 4 Troffer	74	144	10.656	3744	39,896	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	74	88	6.512	24,381	4.144	15,515
4	onal Office Adminis	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
5	File Room	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
6	Area Manager II	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
7	Computer Room	F44EE	Troffer	4	2 x 4 Troffer	8	144	1.152	3744	4,313	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.704	2,636	0.448	1,677
8	Mens Restroom	F41EE	Strip	1	Strip	3	43	0.129	3744	483	N/A	RETROFIT	F41ILL(G3)		1	LBO	3	27	0.081	304	0.048	179
9	Womens Restroom	F41EE	Strip	1	Strip	3	43	0.129	3744	483	N/A	RETROFIT	F41ILL(G3)		1	LBO	3	27	0.081	304	0.048	179
10	RCL	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
11	Valcho Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
12	Nanvoro Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
13	Storage	F42EE	Troffer	2	1 x 4 Troffer	2	72	0.144	520	75	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28
14	Break Room	F44EE	Troffer	4	2 x 4 Troffer	16	144	2.304	3744	8,626	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	16	88	1.408	5,272	0.896	3,355
15	Hallway	FU2EE	Troffer	2	2 x 2 Troffer	10	72	0.720	8760	6,307	N/A	RETROFIT	FU2ILL-R		2	LBO	10	52	0.520	4,555	0.200	1,752
17	Staff Office	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3744	3,235	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	1,977	0.336	1,258
18	Mens Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303
19	Womens Restroom	F42EE	Troffer	2.000	1 x 4 Troffer	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303
20	Page Workroom	F44EE	Troffer	4	2 x 4 Troffer	28	144	4.032	3744	15,096	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	28	88	2.464	9,225	1.568	5,871

Contractor As-Built Savings
16. West Covina Public Library

Contractor As-Built Savings 16. West Covina Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
21	Garage	F82EE	Strip	2	Strip	12	123	1.476	3744	5,526	N/A	RETROFIT	F44ILL-R(G3)		4	Fitkit	12	88	1.066	3,954	0.420	1,572
22	Garage	F42EE	Strip	2	Strip	4	72	0.288	3744	1,078	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	674	0.108	404
23	Main Work Room	F44EE	Troffer	4	2 x 4 Troffer	27	144	3.888	3744	14,557	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	27	88	2.376	8,896	1.512	5,661
24	Book Drop	F42EE	wrap	2	Wrap	1	72	0.072	520	37	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
25	CLM Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
26	GP Computer Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
27	Study Room	F42EE	Wall Mounted Wrap	2	Wall Mounted	1	72	0.072	3744	270	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	168	0.027	101
28	Typing Room	F42EE	Wall Mounted Wrap	2	Wall Mounted	2	72	0.144	3744	539	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	337	0.054	202
29	AV Librarian	F44EE	Troffer	4	2 x 4 Troffer	9	144	1.296	3744	4,852	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	9	88	0.792	2,965	0.504	1,887
30	AV Workroom	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3744	3,235	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	1,977	0.336	1,258
31	Registration File Roo	F44EE	Troffer	4	2 x 2 Troffer	2	144	0.288	3744	1,078	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	659	0.112	419
32	Lobby	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303
33	Mens Restroom	FU2EE	Troffer	2	2 x 2 Troffer	1	72	0.072	3744	270	N/A	RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	195	0.020	75
34	Mens Restroom	F44EE	Troffer	4	2 x 4 Troffer	3	144	0.432	3744	1,617	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	988	0.168	629
35	Custodian	F42EE	wrap	2	Wrap	1	72	0.072	520	37	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
36	Womens Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303

Contractor As-Built Savings
16. West Covina Public Library

Contractor As-Built Savings																						
16. West Covina Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
37	Womens Restroom	FU2EE	Troffer	2	2 x 2 Troffer	1	72	0.072	3744	270	N/A	RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	195	0.020	75
38	Meeting Room	F48EE	Troffer	8	4 x 4 Troffer	16	288	4.608	3744	17,252	N/A	RETROFIT	F48ILL-R(G3)		8	LBO	16	176	2.816	10,543	1.792	6,709
39	Storage	F42EE	wrap	2	Wrap	1	72	0.072	520	37	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14
40	Kitchen	F44EE	Troffer	4	2 x 4 Troffer	2	144	0.288	3744	1,078	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	659	0.112	419
41	FOL Storage	F44EE	Troffer	4	2 x 4 Troffer	1	144	0.144	520	75	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0.056	29
42	Lobby Entrance	FU2EE	Troffer	2	2 x 2 Troffer	12	72	0.864	3744	3,235	N/A	RETROFIT	FU2ILL-R		2	LBO	12	52	0.624	2,336	0.240	899
43	Main Library Downstairs	F48EE	Troffer	8	4 x 4 Troffer	129	288	37.152	3744	139,097	N/A	RETROFIT	F48ILL-R(G3)		8	LBO	129	176	22.704	85,004	14.448	54,093
44	Reflected Ceiling	F41EE	wrap	1	Wrap	176	43	7.568	3744	28,335	N/A	RETROFIT	F41ILL(G3)		1	LBO	176	27	4.770	17,857	2.798	10,477
45	Main Library Downstairs	F44EE	Troffer	4	2 x 4 Troffer	2	144	0.288	3744	1,078	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	659	0.112	419
46	Stairwell	F42EE	wrap	2	Wrap	7	72	0.504	3744	1,887	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	7	45	0.315	1,179	0.189	708
47	Library Upstairs Main	F48EE	Troffer	8	4 x 4 Troffer	36	288	10.368	3744	38,818	N/A	RETROFIT	F48ILL-R(G3)		8	LBO	36	176	6.336	23,722	4.032	15,096
48	Juvenile Work Room	F44EE	Troffer	4	2 x 4 Troffer	3	144	0.432	3744	1,617	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	988	0.168	629
49	Childrens Librarian Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,318	0.224	839
50	Boys Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303
51	Girls Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303
52	Homework Center	F42EE	Troffer	2	1 x 4 Troffer	1	72	0.072	3744	270	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	168	0.027	101
53	Sort Room	F44EE	Troffer	4	2 x 4 Troffer	3	144	0.432	3744	1,617	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	988	0.168	629

Contractor As-Built Savings
16. West Covina Public Library

Contractor As-Built Savings 16. West Covina Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
54	Childrens Wall and Hall	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3744	3,235	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	1,977	0.336	1,258
55	Emergency Exit North	F42EE	wrap	2	Wrap	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	505	0.081	303
56	GP Hallway	FU2EE	Troffer	2	2 x 2 Troffer	8	72	0.576	8760	5,046	N/A	RETROFIT	FU2ILL-R		2	LBO	8	52	0.416	3,644	0.160	1,402
57	GP Workroom Upstairs	F42EE	Troffer	2	1 x 4 Troffer	78	72	5.616	3744	21,026	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	78	45	3.510	13,141	2.106	7,885
61	Mechanical Room	F42EE	Troffer	2	1 x 4 Troffer	15	72	1.080	520	562	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.990	515
63	Hallway	F42EE	wrap	2	Wrap	2	72	0.144	8760	1,261	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	788	0.054	473
64	Emergency Exit South	F41EE	wrap	1	Wrap	5	43	0.215	8760	1,883	N/A	RETROFIT	F41ILL(G3)		1	LBO	5	27	0.136	1,187	0.080	696
																Total T12-T8	767				41.554	154,247
1	Boiler Room	I100/1	Jelly Jar	1	Ceiling Mounted	3	100	0.300	520	156	N/A	RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.099	51.48	0.201	104.52
16	Custodian	I135/1	Keyless	1	Keyless	2	135	0.270	520	140	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	2	48	0.096	50	0.174	90
58	Storage	I100/1	Keyless	1	Keyless	1	100	0.100	520	52	N/A	RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	17	0.067	35
59	Roof-M1	I150/1	Flood	1	Ceiling Mounted	6	150	0.900	520	468	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	6	48	0.288	150	0.612	318
60	Mechanical Room	I150/1	Industrial	1	Ceiling Mounted	15	150	2.250	520	1,170	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	15	48	0.720	374	1.530	796
62	Roof Exterior	I150/1	Keyless	1	Wall Mounted	10	150	1.500	520	780	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	10	48	0.480	250	1.020	530
																Total INCAN	37				3.604	1,874

Contractor As-Built Savings
 16. West Covina Public Library

Contractor As-Built Savings 16. West Covina Public Library																									
Existing Fixtures												New Fixtures								Savings					
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr			
2	Mechanical Room	I200/1	Jelly Jar	1	Ceiling Mounted	9	200	1.800	520	936	N/A	REPLACE	F22ILL-R		1	New 2' 2L T8 OS	9	29	0.259	135	1.541	801			
																Total INCAN-T8	9				1.541	801			
TOTAL						826		114,269		408,063			TOTAL						813		67,570		251,140	46,699	156,922

Aloha Systems Measured Savings
16. West Covina Public Library

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
3	Regional Office Main area	F44EE	Troffer	4	2 x 4 Troffer	74	144	10.656	3872	41,260	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	74	88	6.512	25,214	4.144	16,046	
4	onal Office Adminis	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
5	File Room	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
6	Area Manager II	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
7	Computer Room	F44EE	Troffer	4	2 x 4 Troffer	8	144	1.152	3872	4,461	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	8	88	0.704	2,726	0.448	1,735	
8	Mens Restroom	F41EE	Strip	1	Strip	3	43	0.129	3872	499	N/A	RETROFIT	F41ILL(G3)		1	LBO	3	27	0.081	315	0.048	185	
9	Womens Restroom	F41EE	Strip	1	Strip	3	43	0.129	3872	499	N/A	RETROFIT	F41ILL(G3)		1	LBO	3	27	0.081	315	0.048	185	
10	RCL	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
11	Valcho Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
12	Narvoro Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
13	Storage	F42EE	Troffer	2	1 x 4 Troffer	2	72	0.144	520	75	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.054	28	
14	Break Room	F44EE	Troffer	4	2 x 4 Troffer	16	144	2.304	4270	9,838	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	16	88	1.408	6,012	0.896	3,826	
15	Hallway	FU2E-ILL	Troffer	2	2 x 2 Troffer	10	65	0.650	8760	5,694	N/A	RETROFIT	FU2ILL-R		2	LBO	10	52	0.520	4,555	0.130	1,139	
17	Staff Office	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	4270	3,689	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	2,255	0.336	1,435	
18	Mens Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3872	836	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	523	0.081	314	

Aloha Systems Measured Savings
16. West Covina Public Library

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
19	Womens Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3872	836	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	523	0.081	314	
20	Page Workroom	F44EE	Troffer	4	2 x 4 Troffer	28	144	4.032	4270	17,217	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	28	88	2.464	10,521	1.568	6,695	
21	Garage	F82EE	Strip	2	Strip	12	123	1.476	4380	6,465	N/A	RETROFIT	F44ILL-R(G3)		4	Fitkit	12	88	1.056	4,625	0.420	1,840	
22	Garage	F42EE	Strip	2	Strip	4	72	0.288	4380	1,261	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	4	45	0.180	788	0.108	473	
23	Main Work Room	F44EE	Troffer	4	2 x 4 Troffer	27	144	3.888	4270	16,602	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	27	88	2.376	10,146	1.512	6,456	
24	Book Drop	F42EE	wrap	2	Wrap	1	72	0.072	520	37	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14	
25	CLM Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
26	GP Computer Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3872	2,230	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,363	0.224	867	
27	Study Room	F42EE	Wall Mounted Wrap	2	Wall Mounted	1	72	0.072	3872	279	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	174	0.027	105	
28	Typing Room	F42EE	Wall Mounted Wrap	2	Wall Mounted	2	72	0.144	3872	558	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	348	0.054	209	
29	AV Librarian	F44EE	Troffer	4	2 x 4 Troffer	9	144	1.296	3872	5,018	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	9	88	0.792	3,067	0.504	1,951	
30	AV Workroom	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3872	3,345	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	2,044	0.336	1,301	
31	Registration File Room	F44EE	Troffer	4	2 x 2 Troffer	2	144	0.288	3872	1,115	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	681	0.112	434	
32	Lobby	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3872	836	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	523	0.081	314	
33	Mens Restroom	FU2E-ILL	Troffer	2	2 x 2 Troffer	1	65	0.065	3872	252	N/A	RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	201	0.013	50	

Aloha Systems Measured Savings
16. West Covina Public Library

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
34	Mens Restroom	F44EE	Troffer	4	2 x 4 Troffer	3	144	0.432	3872	1,673	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	1,022	0.168	650	
35	Custodian	F42EE	wrap	2	Wrap	1	72	0.072	520	37	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14	
36	Womens Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3872	836	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	523	0.081	314	
37	Womens Restroom	FU2E-iLL	Troffer	2	2 x 2 Troffer	1	65	0.065	3872	252	N/A	RETROFIT	FU2ILL-R		2	LBO	1	52	0.052	201	0.013	50	
38	Meeting Room	F48EE	Troffer	8	4 x 4 Troffer	16	288	4.608	151	696	N/A	RETROFIT	F48ILL-R(G3)		8	LBO	16	176	2.816	425	1.792	271	
39	Storage	F42EE	wrap	2	Wrap	1	72	0.072	520	37	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	23	0.027	14	
40	Kitchen	F44EE	Troffer	4	2 x 4 Troffer	2	144	0.288	3872	1,115	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	681	0.112	434	
41	FOL Storage	F44EE	Troffer	4	2 x 4 Troffer	1	144	0.144	520	75	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	1	88	0.088	46	0.056	29	
42	Lobby Entrance	FU2E-iLL	Troffer	2	2 x 2 Troffer	12	65	0.780	3872	3,020	N/A	RETROFIT	FU2ILL-R		2	LBO	12	52	0.624	2,416	0.156	604	
43	Main Library Downstairs	F48EE	Troffer	8	4 x 4 Troffer	129	288	37.152	3872	143,853	N/A	RETROFIT	F48ILL-R(G3)		8	LBO	129	176	22.704	87,910	14.448	55,943	
44	Reflected Ceiling	F41EE	wrap	1	Wrap	176	43	7.568	3872	29,303	N/A	RETROFIT	F41ILL(G3)		1	LBO	176	27	4.770	18,468	2.798	10,835	
45	Main Library Downstairs	F44EE	Troffer	4	2 x 4 Troffer	2	144	0.288	3872	1,115	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88	0.176	681	0.112	434	
46	Stainwell	F42EE	wrap	2	Wrap	7	72	0.504	8760	4,415	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	7	45	0.315	2,759	0.189	1,656	
47	Library Upstairs Main	F48EE	Troffer	8	4 x 4 Troffer	36	288	10.368	3166	32,825	N/A	RETROFIT	F48ILL-R(G3)		8	LBO	36	176	6.336	20,060	4.032	12,765	
48	Juvenile Work Room	F44EE	Troffer	4	2 x 4 Troffer	3	144	0.432	3166	1,368	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	836	0.168	532	

Aloha Systems Measured Savings
16. West Covina Public Library

Aloha Systems Measured Savings 16. West Covina Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
49	Childrens Librarian Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3166	1,824	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88	0.352	1,114	0.224	709
50	Boys Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3166	684	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	427	0.081	256
51	Girls Restroom	F42EE	Troffer	2	1 x 4 Troffer	3	72	0.216	3166	684	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	427	0.081	256
52	Homework Center	F42EE	Troffer	2	1 x 4 Troffer	1	72	0.072	3166	228	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	1	45	0.045	142	0.027	85
53	Sort Room	F44EE	Troffer	4	2 x 4 Troffer	3	144	0.432	4270	1,845	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	3	88	0.264	1,127	0.168	717
54	Childrens Wall and Hall	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3166	2,735	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88	0.528	1,672	0.336	1,064
55	Emergency Exit North	F42EE	wrap	2	Wrap	3	72	0.216	8760	1,892	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45	0.135	1,183	0.081	710
56	GP Hallway	FU2E-LL	Troffer	2	2 x 2 Troffer	8	65	0.520	8760	4,555	N/A	RETROFIT	FU2ILL-R		2	LBO	8	52	0.416	3,644	0.104	911
57	GP Workroom Upstairs	F42EE	Troffer	2	1 x 4 Troffer	78	72	5.616	3872	21,745	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	78	45	3.510	13,591	2.106	8,154
61	Mechanical Room	F42EE	Troffer	2	1 x 4 Troffer	15	72	1.080	520	562	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	47	0.990	515
63	Hallway	F42EE	wrap	2	Wrap	2	72	0.144	8760	1,261	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45	0.090	788	0.054	473
64	Emergency Exit South	F41EE	wrap	1	Wrap	5	43	0.215	8760	1,883	N/A	RETROFIT	F41ILL(G3)		1	LBO	5	27	0.136	1,187	0.080	696
																Total T12-T8	767				41.330	151,078
1	Boiler Room	I100/1	Jelly Jar	1	Ceiling Mounted	3	100	0.300	520	156	N/A	RETROFIT	CFQ26/1		1	TCP CFSI	3	33	0.099	51.48	0.201	104.52

Aloha Systems Measured Savings
16. West Covina Public Library

		Existing Fixtures										New Fixtures									Savings			
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
16	Custodian	I135/1	Keyless	1	Keyless	2	135	0.270	520	140	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	2	48	0.096	50	0.174	90		
58	Storage	I100/1	Keyless	1	Keyless	1	100	0.100	520	52	N/A	RETROFIT	CFQ26/1		1	TCP CFSI	1	33	0.033	17	0.067	35		
59	Roof-M1	I150/1	Flood	1	Ceiling Mounted	6	150	0.900	520	468	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	6	48	0.288	150	0.612	318		
60	Mechanical Room	I150/1	Industrial	1	Ceiling Mounted	15	150	2.250	520	1,170	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	15	48	0.720	374	1.530	796		
62	Roof Exterior	I150/1	Keyless	1	Wall Mounted	10	150	1.500	520	780	N/A	RETROFIT	CFQ42/1		1	TCP CFSI	10	48	0.480	250	1.020	530		
																Total INCAN	37				3.604	1,874		
2	Mechanical Room	I200/1	Jelly Jar	1	Ceiling Mounted	9	200	1.800	520	936	N/A	REPLACE	F22ILL-R		1	New 2' 2L T8 OS	9	29	0.259	135	1.541	801		
																Total INCAN-T8	9				1.541	801		
TOTAL						826		114.045		402.737			TOTAL						813		67.570	248,984	46.475	153,753

West Covina Library – 1601 West Covina Pkwy.



Main Library Lighting



Children's Library Fixtures



Main Library 4 x 4 Fixture



Main Library 4x4 Ballast



4 Lamp Fixture and Ballasts



4 Lamp Fixture Ballast

West Covina Library – 1601 West Covina Pkwy.



Book Storage Room Lighting



Book Storage Room Fixtures



1x4 Wall Mounted Strip



1x4 Wall Mounted Strip Ballast



2 Lamp U-Bent Fixture

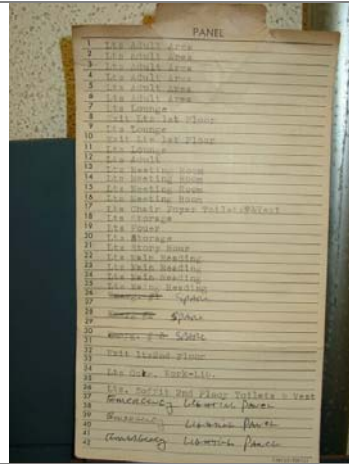


2 Lamp U-Bent Fixture Ballast

West Covina Library – 1601 West Covina Pkwy.



Lighting Panel and Data Loggers



Panel Legend

Site Measurement and Verification Report

Site Number 17

Clifton M. Brakensiek Public Library

9945 E. Flower Street, Bellflower

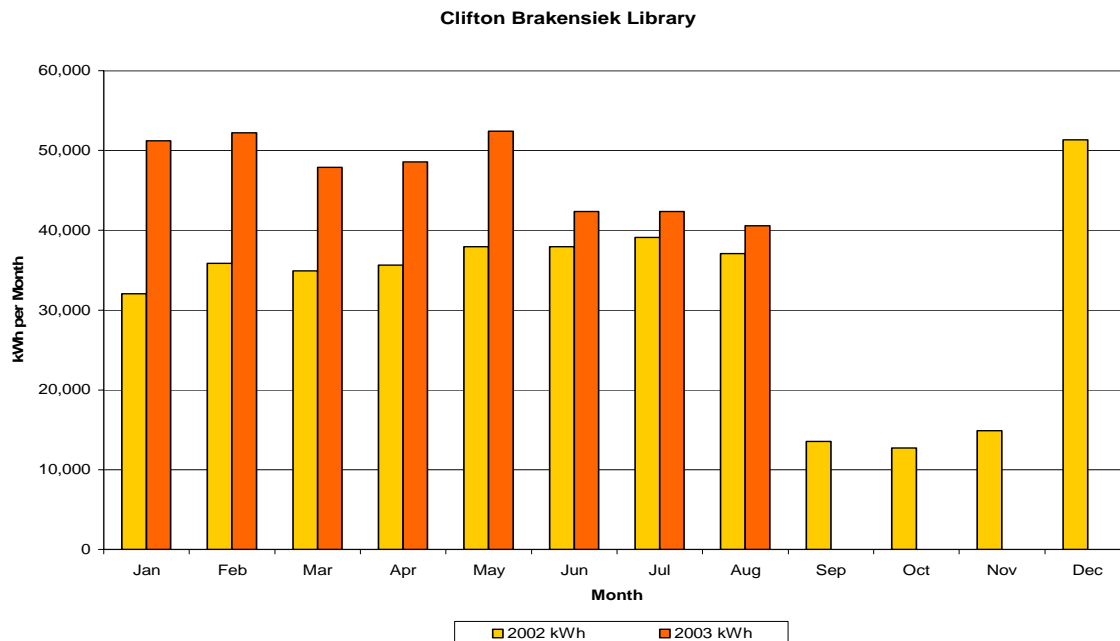
SCE Account 3-001-4065-82

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	95,411 kWh
Contractor's As-Built Estimate	94,726 kWh
<i>Ex-Ante</i> Evaluation	99,387 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	70,957 kWh

Site Description

The library is a single story building with an equipment room in the basement level of the library which houses the air handler, compressor, boiler, and outdoor lawn sprinkler system. It has a large open main library section and smaller offices in the rear of the library that are used for staff. There is also a community room used for public meetings and gatherings. Southern California Edison supplies the facility at 480Y/277 volts through meter PO376-000793. Its annual energy consumption in 2002 was 383,040 kWh, and its peak demand was 127 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The operating hours for the library is Monday through Wednesday from 11:00 a.m. to 8:00 p.m., Thursday from 11:00 a.m. to 6:00 p.m., Friday from 1:00 p.m. to 5:00 p.m., and Saturday from 11:00 a.m. to 5:00 p.m.



Preliminary Site Visit

The site was visited on April 22, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

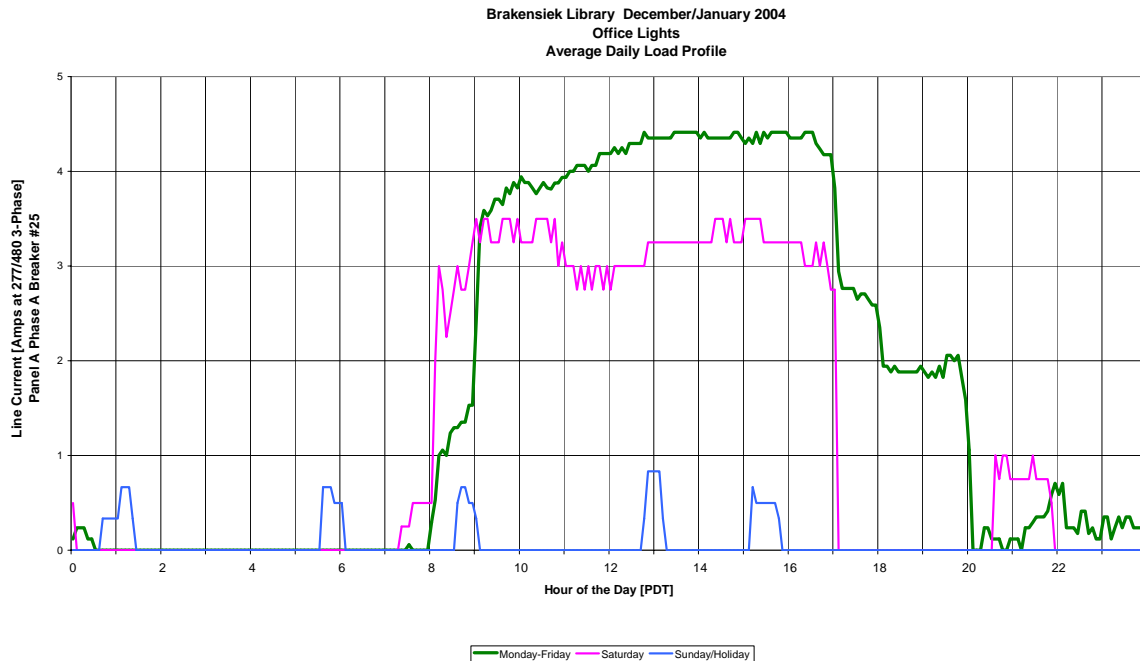
Post-Retrofit Audit

The site was again visited on December 17, 2003. We specifically re-verified the observations noted during the preliminary site visit.

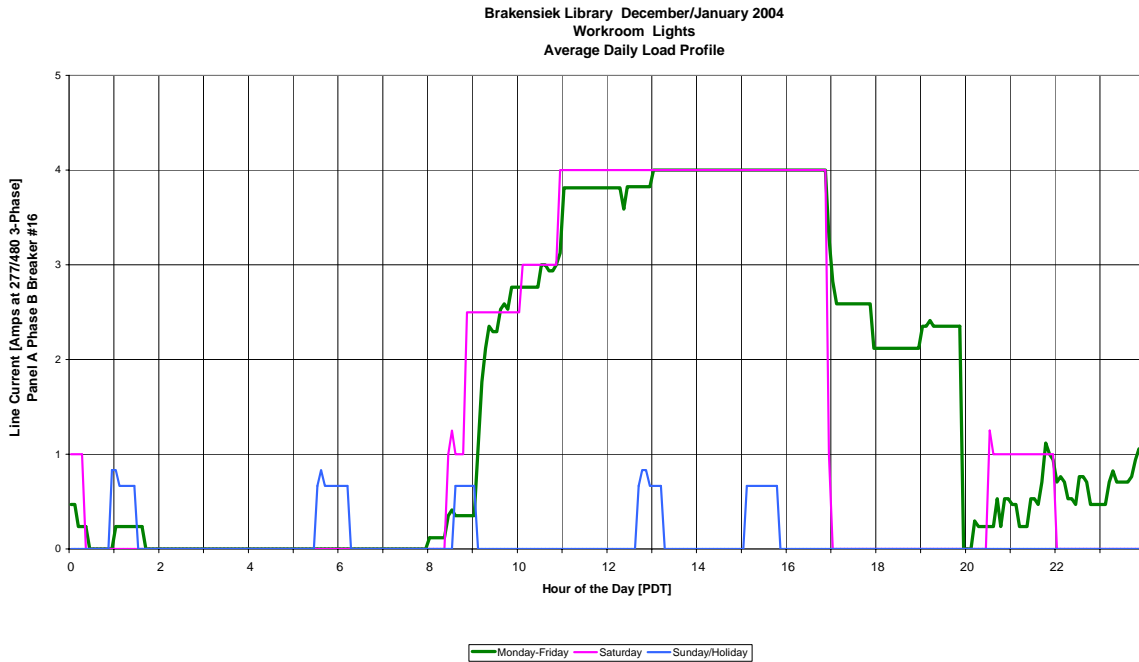
Metered Operating Hours

Dataloggers were installed to verify the operating hours of the lighting system. Four dataloggers were installed in control panel A. Three of the loggers monitored different areas inside the library, and a fourth datalogger monitored the total B phase of control panel A, which is all lighting. Areas that were monitored include offices, conference room, staff office, staff room, hall, and workroom lights.

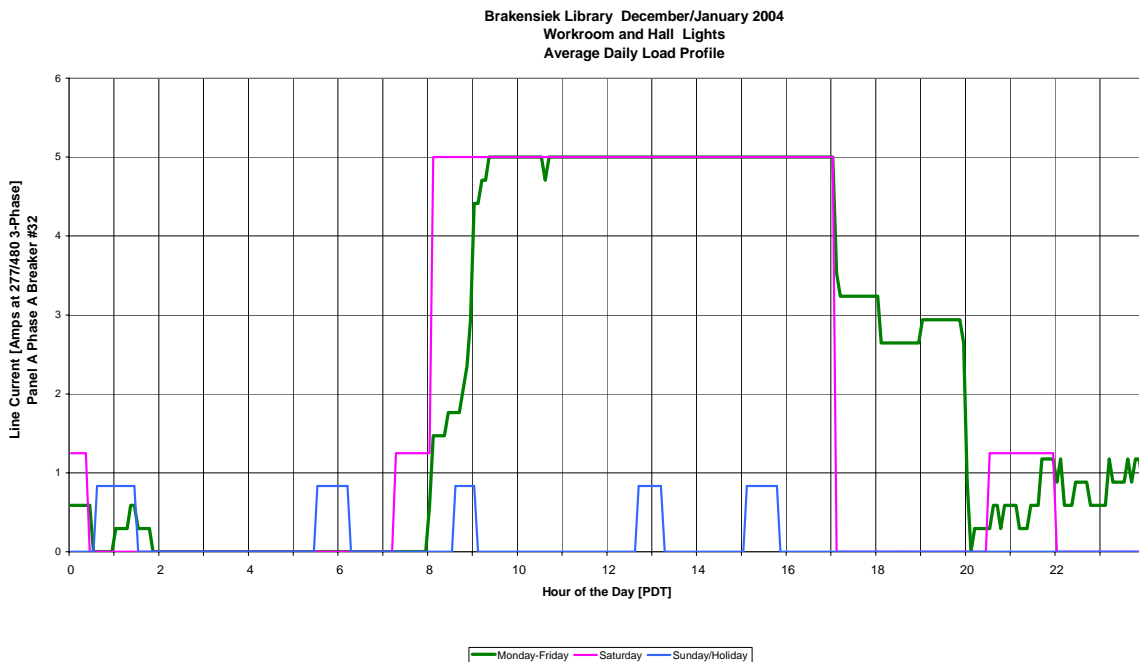
Offices/Conference Room: The load profile on the following page represents offices, conference room, staff office, and staff room. These areas are most active during the afternoon. The full load equivalent operating time is 2037 hours per year. The contractor as built full load equivalent operating hours is 3744 hours per year.



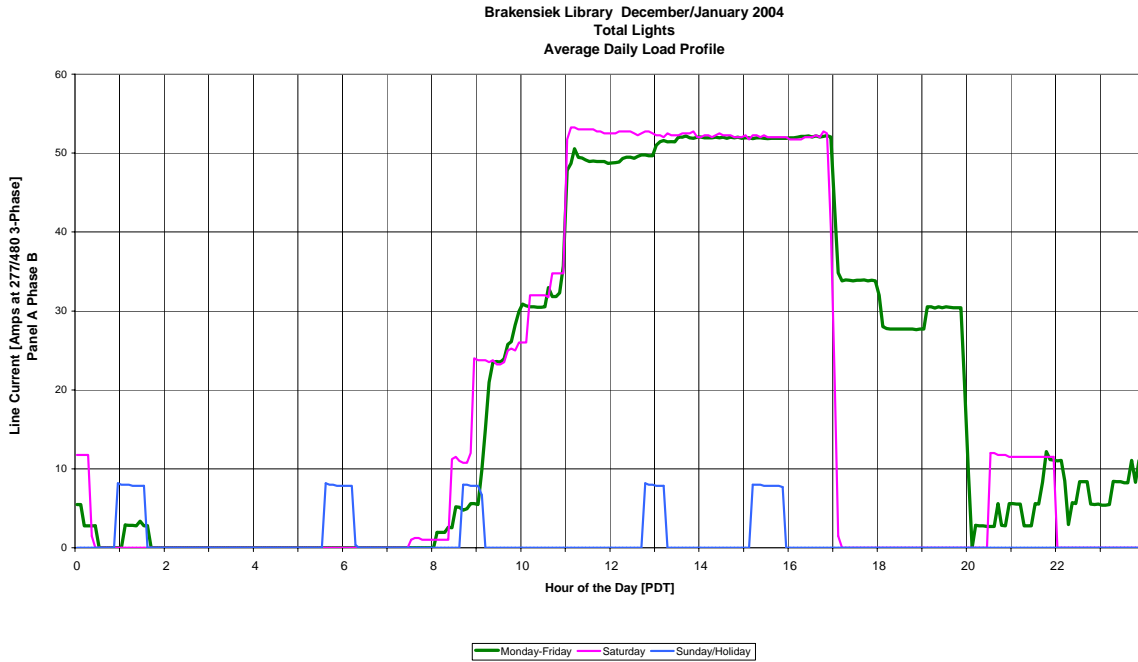
Workroom: The load profile below represents the lights monitored in the workroom. The full load equivalent operating time is 2845 hours per year. The contractor as built full load equivalent operating time is 3744 hours per year.



Workroom & Hall: The load profile below represents the lights monitored in the workroom and hall. The full load operating time for the workroom and hall lights is 3250 hours per year.



Total B Phase: The load profile below represents the B phase of all the lights in control panel A. The full load operating time is 2765 hours per year. This validates the separate readings achieved for the office areas and the workroom since it is between those two values.



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries and highlighted in tan. Numbers that were not changed from the contractor’s values were not changed.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

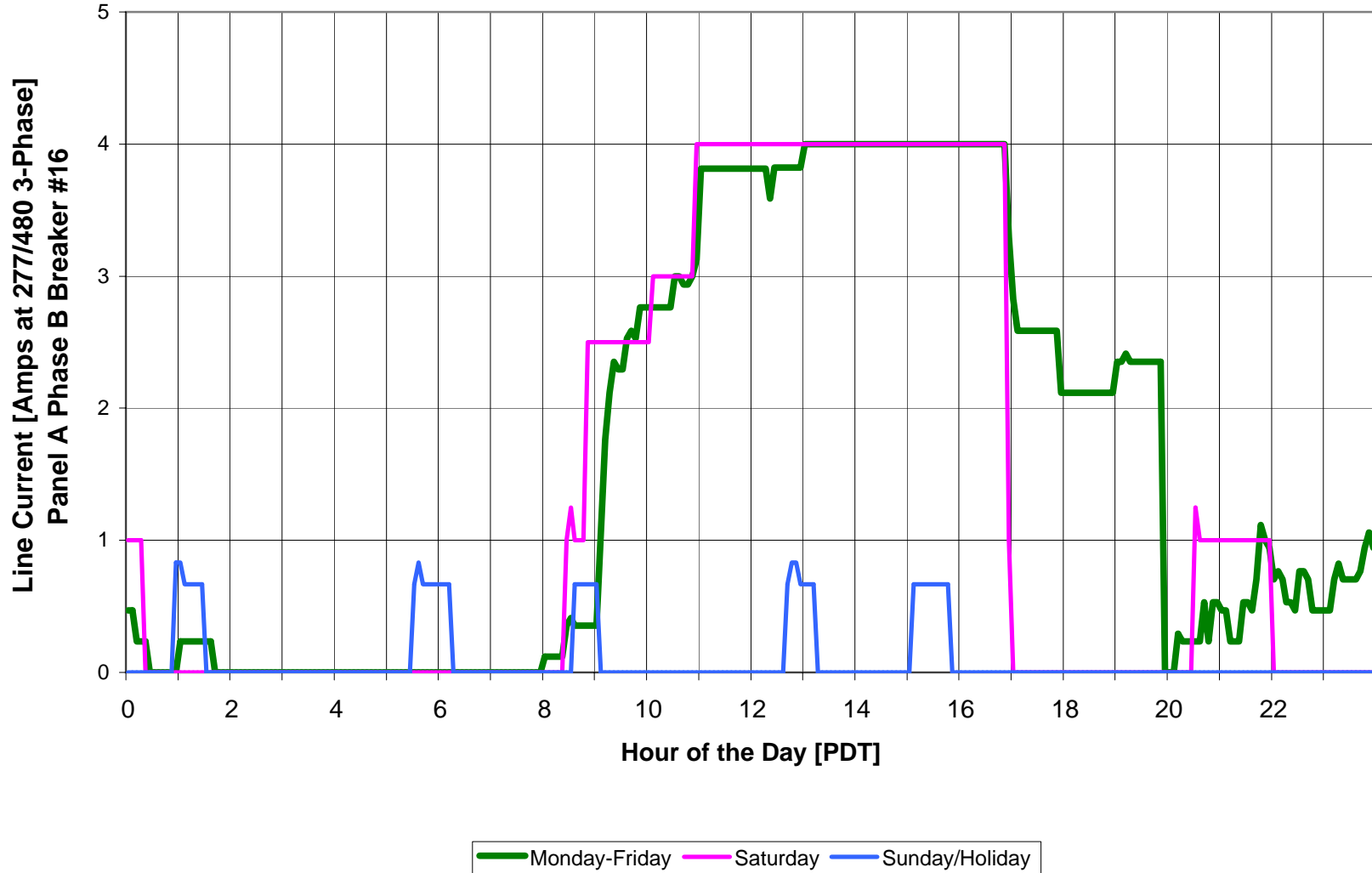
The following table delineates the savings at this site for each of the measure types included in the program.

Clifton M. Brakensiek Public Library Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights	8	1,033	8	1,033	2,887	2,418
T12 to T8	558	94,378	559	93,693	96,500	68,539
Inc to CFL						
Total	566	95,411	567	94,726	99,387	70,957

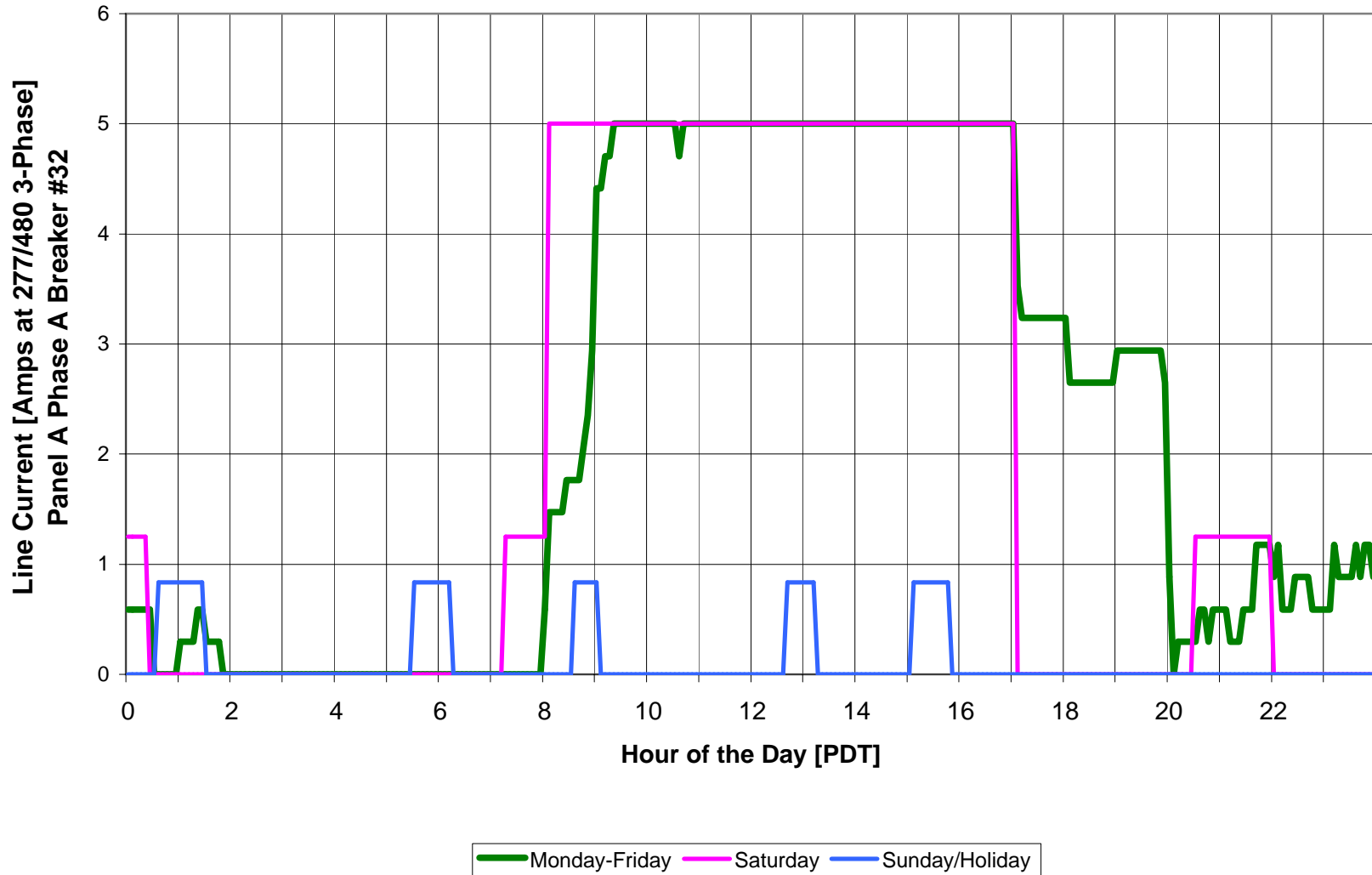
The *ex-post* savings calculation is lower than either the county's or contractor's estimates because the recorded operating hours (in the 2800 h/yr range) were lower than the original assumptions in the 3700 h/yr range. The *ex-ante* savings estimate is higher because the program-wide per-fixture savings was higher than achieved at this site.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

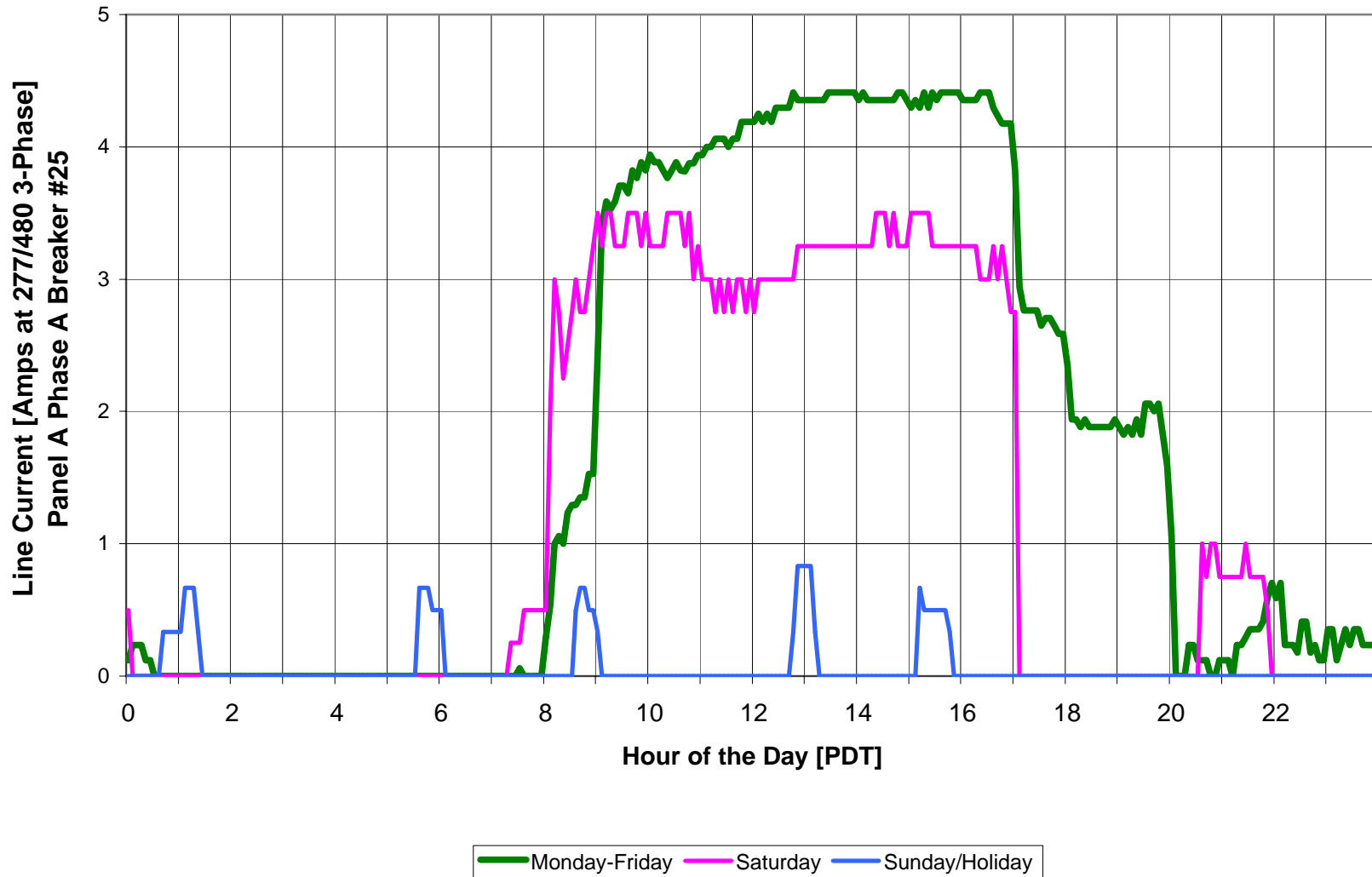
Brakensiek Library December/January 2004
Workroom Lights
Average Daily Load Profile



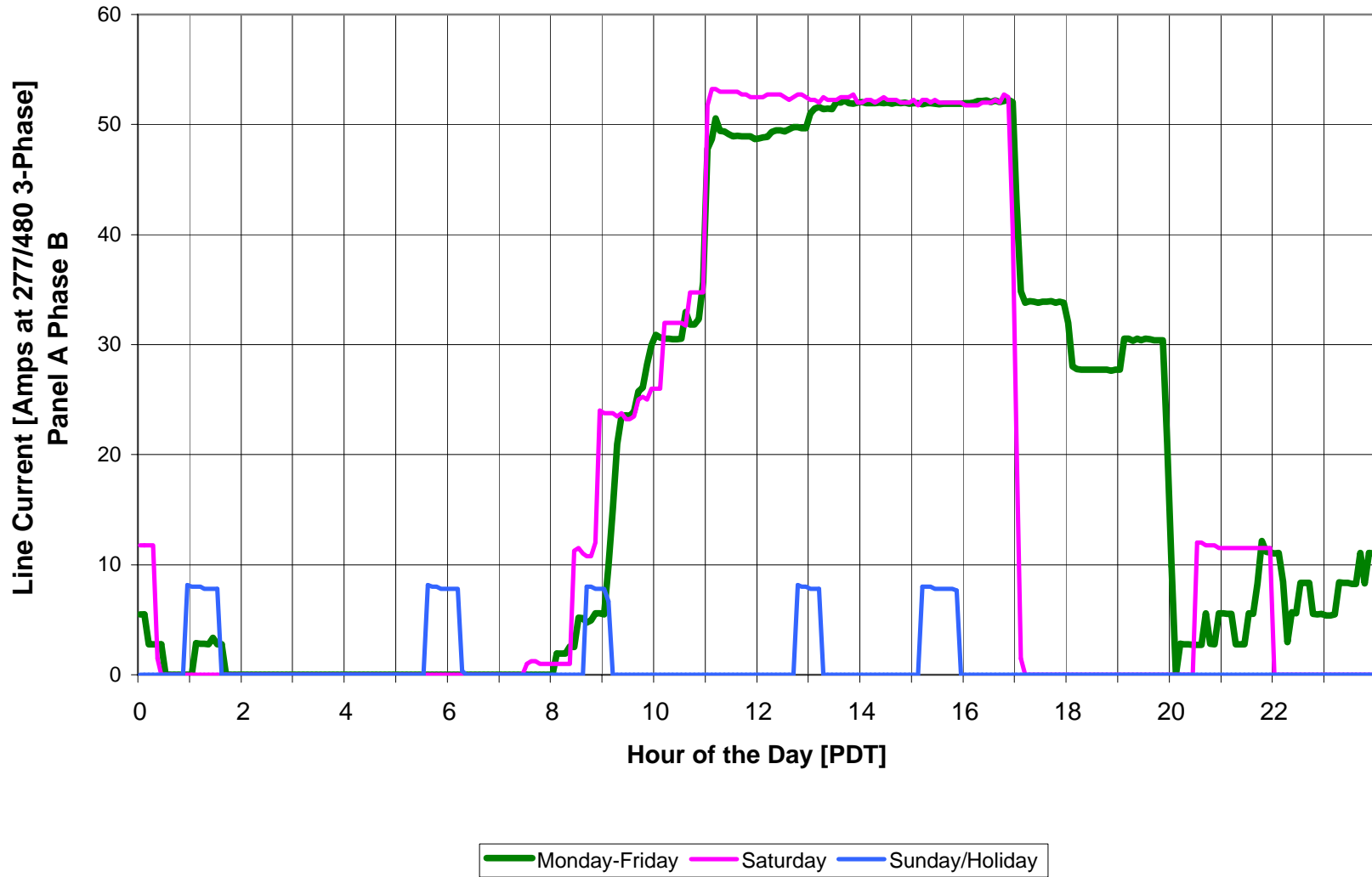
**Brakensiek Library December/January 2004
Workroom and Hall Lights
Average Daily Load Profile**



Brakensiek Library December/January 2004
Office Lights
Average Daily Load Profile



Brakensiek Library December/January 2004
Total Lights
Average Daily Load Profile



Contractor As-Built Savings
17. Clifton M. Brakenseik Public Library

Contractor As-Built Savings																						
		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: Motion sen & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
20	Exit Signs	E120/2	Exit Signs	2	ALL	8	40	0.320	3744	1,198	N/A	REPLACE	ELED2/1		1	New VEX Dual Circuit	8	5.500	0.04	165	0.276	1,033
																Total Exits	8				0.276	1,033
1	Main Room	F44EE	Troffer	4.000	2 x 4 Troffer	256	144.00	36.864	3,744	138,019	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	256	88.000	23	84,345	14.336	53,674
2	Main Room	F42EE	Troffer	2	2 x 4 Troffer	168	72	12.096	3744	45,287	non DIMMING	RETROFIT	F42ILL-R(G3)		2	LBO	168	45.000	7.56	28,305	4.536	16,983
3	Custodian	F41EE	Strip	1	Strip	2	43	0.086	520	45	N/A	RETROFIT	F41ILL(G3)		1	LBO	1	27.100	0.03	14	0.059	31
4	Typing Room	F42EE	Wrap	2	Wrap	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45.000	0.14	505	0.081	303
5	Reception and Lobby	F44EE	Troffer	4	2 x 4 Troffer	38	144	5.472	3744	20,487	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	38	88.000	3.34	12,520	2.128	7,967
6	Unmarked Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	3744	2,157	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88.000	0.35	1,318	0.224	839
7	Unmarked Office	F44EE	Troffer	4	2 x 4 Troffer	2	144	0.288	3744	1,078	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88.000	0.18	659	0.112	419
8	Womens Restroom	F42EE	Wrap	2	Wrap	3	72	0.216	3744	809	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45.000	0.14	505	0.081	303
9	Mens Restroom	F42EE	Wrap	2	Wrap	4	72	0.288	3744	1,078	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	4	45.000	0.18	674	0.108	404
10	Community Room	F44EE	Troffer	4	2 x 4 Troffer	12	144	1.728	3744	6,470	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	12	88.000	1.06	3,954	0.672	2,516
11	Kitchen	F44EE	Troffer	4	2 x 4 Troffer	1	144	0.144	3744	539	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	1	88.000	0.09	329	0.056	210
12	Telecomm	F44EE	Troffer	4	2 x 4 Troffer	1	144	0.144	520	75	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	1	88.000	0.09	46	0.056	29
13	Womens Staff Restroom	F42EE	Wrap	2	Wrap	2	72	0.144	3744	539	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45.000	0.09	337	0.054	202

Contractor As-Built Savings
17. Clifton M. Brakenseik Public Library

		Existing Fixtures										New Fixtures										Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: Motion sen & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
14	Mens Staff Restroom	F42EE	Wrap	2	Wrap	2	72	0.144	3744	539	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45.000	0.09	337	0.054	202	
15	Staff Work Room	F44EE	Troffer	4	2 x 4 Troffer	33	144	4.752	3744	17,791	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	35	88.000	3.08	11,532	1.672	6,260	
16	Breakroom	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3744	3,235	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88.000	0.53	1,977	0.336	1,258	
17	Book Drop	F22SS	Strip	2	Strip	1	56	0.056	520	29	N/A	RETROFIT	F22ILL-R		2	LBO	1	28.800	0.03	15	0.027	14	
18	Office	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	3744	3,235	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88.000	0.53	1,977	0.336	1,258	
19	Mechanical Room	F42EE	Strip	2	Strip	8	72	0.576	520	300	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	8	45.000	0.36	187	0.216	112	
21	Exterior	F42EE	Wrap	2	Wrap	6	72	0.432	4368	1,887	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	6	45.000	0.27	1,179	0.162	708	
																Total T12-T8	559				25.306	93,693	
TOTAL						596		74.970		283,607			TOTAL						567	40.69	150,879	25.582	94,726

Aloha Systems Measured Savings
17. Clifton M. Brakensiek Public Library

Aloha Systems Measured Savings 17. Clifton M. Brakensiek Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: Motion sen & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
20	Exit Signs	E120/2	Exit Signs	2	ALL	8	40	0.320	8760	2,803	N/A	REPLACE	ELED2/1		1	New VEX Dual Circuit	8	5.500	0.04	385	0.276	2,418
																Total Exits	8				0.276	2,418
1	Main Room	F44EE	Troffer	4.000	2 x 4 Troffer	256	144.00	36.864	2,845	104,878	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	256	88.000	23	64,092	14.336	40,786
2	Main Room	F42EE	Troffer	2	2 x 4 Troffer	168	72	12.096	2,845	34,413	non DIMMING	RETROFIT	F42ILL-R(G3)		2	LBO	168	45.000	7.56	21,508	4.536	12,905
3	Custodian	F41EE	Strip	1	Strip	2	43	0.086	520	45	N/A	RETROFIT	F41ILL(G3)		1	LBO	1	27.100	0.03	14	0.059	31
4	Typing Room	F42EE	Wrap	2	Wrap	3	72	0.216	2037	440	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45.000	0.14	275	0.081	165
5	Reception and Lobby	F44EE	Troffer	4	2 x 4 Troffer	38	144	5.472	2037	11,146	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	38	88.000	3.34	6,812	2.128	4,335
6	Unmarked Office	F44EE	Troffer	4	2 x 4 Troffer	4	144	0.576	2037	1,173	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	4	88.000	0.35	717	0.224	456
7	Unmarked Office	F44EE	Troffer	4	2 x 4 Troffer	2	144	0.288	2037	587	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	2	88.000	0.18	359	0.112	228
8	Womens Restroom	F42EE	Wrap	2	Wrap	3	72	0.216	2,845	615	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	3	45.000	0.14	384	0.081	230
9	Mens Restroom	F42EE	Wrap	2	Wrap	4	72	0.288	2,845	819	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	4	45.000	0.18	512	0.108	307
10	Community Room	F44EE	Troffer	4	2 x 4 Troffer	12	144	1.728	2037	3,520	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	12	88.000	1.06	2,151	0.672	1,369
11	Kitchen	F44EE	Troffer	4	2 x 4 Troffer	1	144	0.144	2,845	410	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	1	88.000	0.09	250	0.056	159
12	Telecomm	F44EE	Troffer	4	2 x 4 Troffer	1	144	0.144	520	75	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	1	88.000	0.09	46	0.056	29
13	Womens Staff Restroom	F42EE	Wrap	2	Wrap	2	72	0.144	2,845	410	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45.000	0.09	256	0.054	154

Aloha Systems Measured Savings
17. Clifton M. Brakensiek Public Library

Aloha Systems Measured Savings 17. Clifton M. Brakensiek Public Library																							
Existing Fixtures												New Fixtures								Savings			
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: Motion sen & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
14	Mens Staff Restroom	F42EE	Wrap	2	Wrap	2	72	0.144	2,845	410	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	2	45.000	0.09	256	0.054	154	
15	Staff Work Room	F44EE	Troffer	4	2 x 4 Troffer	33	144	4.752	2,845	13,519	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	35	88.000	3.08	8,763	1.672	4,757	
16	Breakroom	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	2,845	2,458	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88.000	0.53	1,502	0.336	956	
17	Book Drop	F22SS	Strip	2	Strip	1	56	0.056	520	29	N/A	RETROFIT	F22ILL-R		2	LBO	1	28.800	0.03	15	0.027	14	
18	Office	F44EE	Troffer	4	2 x 4 Troffer	6	144	0.864	2037	1,760	N/A	RETROFIT	F44ILL-R(G3)		4	LBO	6	88.000	0.53	1,076	0.336	684	
19	Mechanical Room	F42EE	Strip	2	Strip	8	72	0.576	520	300	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	8	45.000	0.36	187	0.216	112	
21	Exterior	F42EE	Wrap	2	Wrap	6	72	0.432	4368	1,887	N/A	RETROFIT	F42ILL-R(G3)		2	LBO	6	45.000	0.27	1,179	0.162	708	
																Total T12-T8	559				25.306	68,539	
TOTAL						566		66.270		181,696			TOTAL				567		40.69	110,739		25.582	70,957

Clifton M. Brakensiek Public Library – 9945 E. Flower Street



Clifton Brakensiek Library Building



Outdoor 4-foot 2-lamp Fixture (On Beams)



Main Library 2-lamp 4-Foot Fixtures



**Main Library 2-lamp and 4-lamp
4-Foot Fixtures**



4-lamp 4-Foot Fluorescent Fixture Rows



**The Equipment Room Boiler
And Main Electrical Panels**

Clifton M. Brakensiek Public Library – 9945 E. Flower Street



4-lamp 4-Foot Fluorescent Fixture Row



4-lamp 4-Foot Fluorescent Fixture Ballasts



Another Picture of a 4-lamp 4-Foot Fluorescent Fixture



Another Picture of a 4-lamp 4-Foot Fluorescent Fixture With Ballasts



A 2-lamp 277-volt Fluorescent Ballast



Library Light Switches (Left Side)

Clifton M. Brakensiek Public Library – 9945 E. Flower Street



Library Light Switches (Right Side)



Panel A With Dataloggers

ELECTRICAL MAINTENANCE

PANEL "A"

1	Reading room
2	" "
3	" "
4	" "
5	" "
6	" "
7	" "
8	" "
9	" "
10	" "
11	" "
12	" "
13	" "
14	" "
15	" "
16	" "
17	" "
18	" "
19	" "
20	" "
21	" "
22	" "
23	" "
24	" "
25	Lib. off., conf., staff off., staff rm, read rm
26	Reading room
27	" " Custodian, AV rooms
28	" "
29	" "
30	Meeting, vent., lobby
31	Lobby
32	Work r., hall
33	Lobby
34	Work room
35	Mech. rm., pantry, stor., men women
36	Spare
37	" "
38	" "
39	" "
40	" "
41	" "
42	" "

Panel A Legend

Site Measurement and Verification Report

Site Number 18

North Services Agency - Service Building

31320 N. Castaic Rd., Castaic

SCE Account 3-001-4069-06

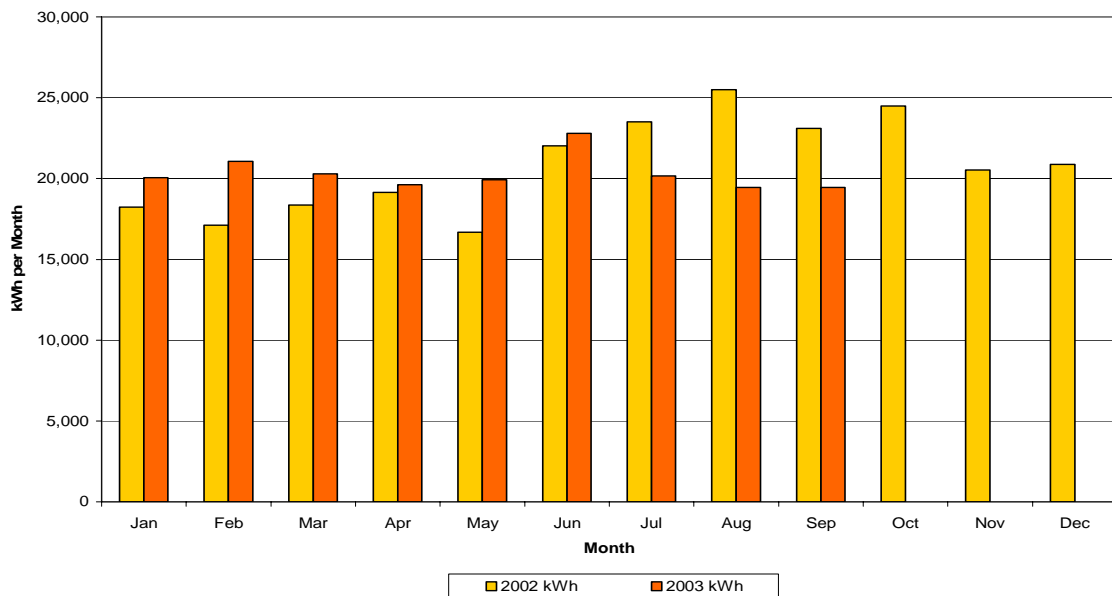
Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	102,038 kWh
Contractor's As-Built Estimate	124,480 kWh
<i>Ex-Ante</i> Evaluation	55,656 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	100,133 kWh

Site Description

This facility consists of a single building with administration offices and a large warehouse facility. It has a variety of small offices, a conference room, break room, and restrooms. The warehouse has some contained and partitioned areas used for painting and carpentry. There are small offices in these areas of the warehouse for supervisors. The facility is supplied by Southern California Edison at 480Y/277 volts through meter PO726-001158. Its annual energy consumption in 2002 was 249,540 kWh, and its peak demand was 88 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.

The main offices are operational Monday-Friday from 6:00 a.m. to 5:00 p.m. The warehouse is operational Monday-Friday from 6:30 a.m. to 3:30 p.m.

North Services Agency Parks and Recreation



Spreadsheet Errors

The spreadsheets were presented to us with direct values rather than formulas. Upon conversion to formulas, occasionally the rows did not multiply correctly and occasionally the rows did not add exactly to the reported total. Often this was the case when “no change” was reported because of the use of zero quantities. We corrected these problems by setting both the “existing” and “new” quantities to zero for any line item in which there were not fixtures changes. This will allow both the fixture and kWh sums to accurately represent the project. The purpose of the lighting spreadsheets is not to document every light in the facility, but rather to document only those that were retrofitted.

Changes made as a result of correcting the contractor’s spreadsheet errors are highlighted in lavender on Aloha’s “metered” spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor’s as-built spreadsheet.

Preliminary Site Visit

The site was visited on April 1, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be fairly accurate as described on the spreadsheets. Roughly 75% of the T12, 4-foot lamps were 40-watt as opposed to the 34-watt lamps noted on the preliminary survey. Pre-retrofit fixture wattages were increased to account for this observation. They were highlighted in magenta.

Post-Retrofit Audit

The site was again visited on October 16, 2003. The retrofits were verified by means of a general walk through and inspection and no post retrofit discrepancies were noted.

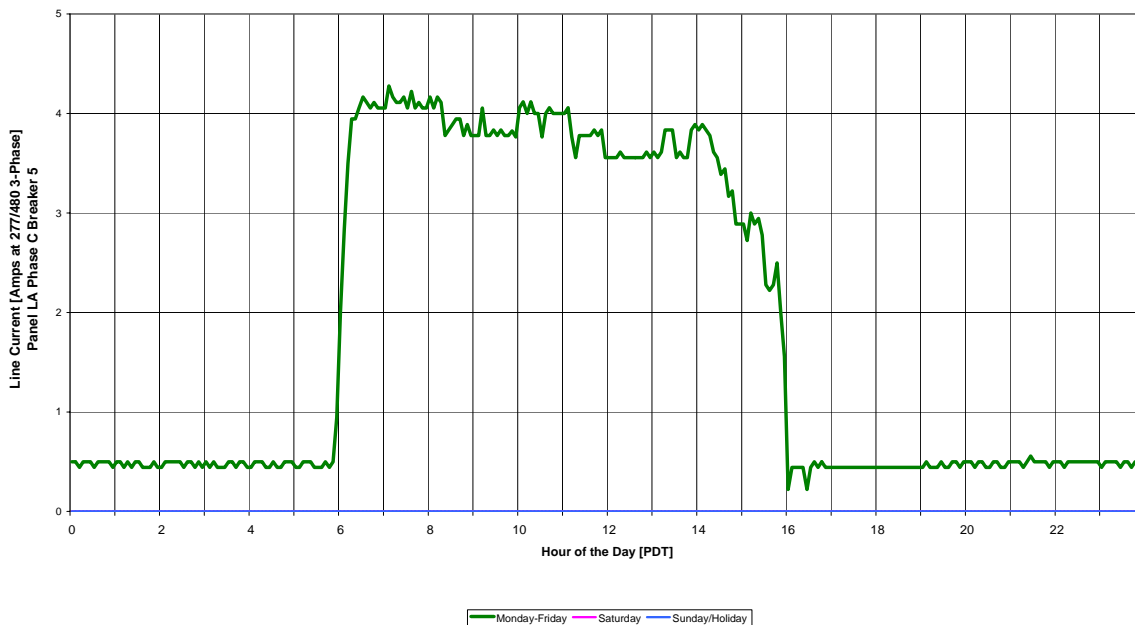
Metered Operating Hours

In order to verify operating hours of the facility, various lighting loads were monitored. The lighting areas on which we collected data were:

- Carpenter Shop
- Main Warehouse
- North Warehouse

Carpenter Shop: The carpenter shop lights, shown on the following page are on, from 6:00 a.m. until 4:00 p.m. during the week and are off during the weekend. The full load equivalent operating hours are 2637 hours per year. The contractor as built full load equivalent operating hours is 3120 hours per year.

North Services Agency October/November 2003
 Carpenter Shop Lights
 Average Daily Load Profile



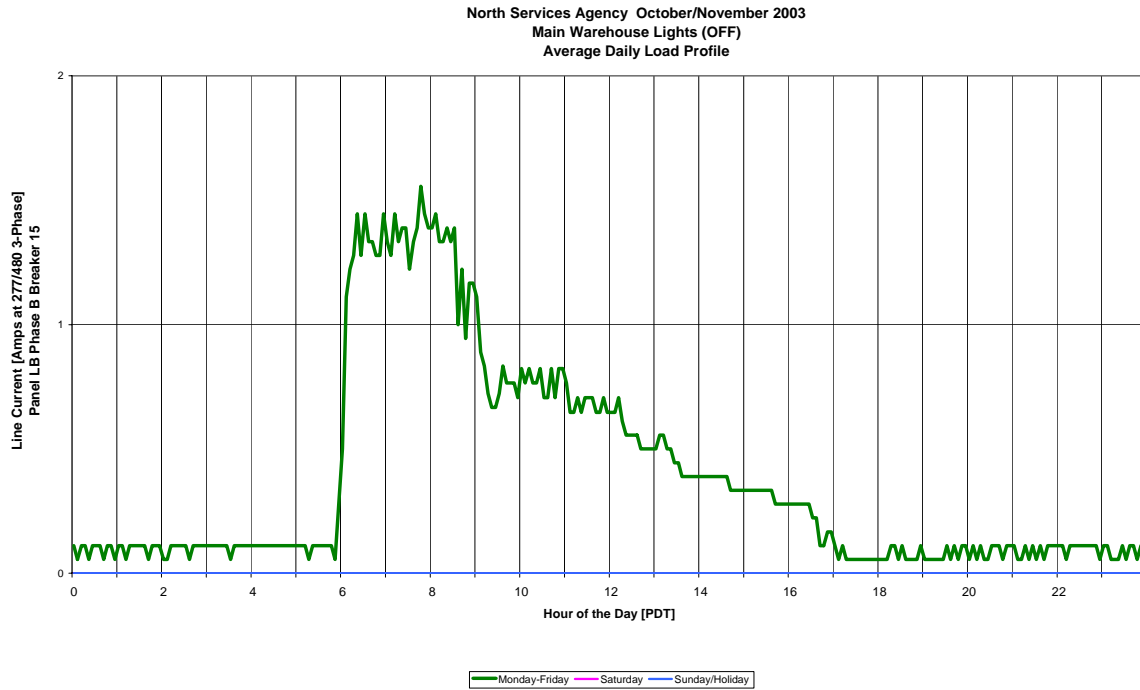
Main Warehouse: The main warehouse in the facility had two operating hour scenarios, a before retrofit and an after retrofit scenario. During our preliminary site visit the staff in the facility operated all the lights in the warehouse equally. However, after the retrofit, the staff became more energy conscience. They began to use 80% of the fixtures less frequently. To monitor this behavior, both sets of lights were monitored.

The load profile below displays the operating behavior of the set of fixtures which are used more frequently. This profile shows the operation of these fixtures from about 6:00 a.m. until 5:00 p.m. The full load equivalent operating hours is 2538 hours per year.

North Services Agency October/November 2003
 Main Warehouse Shop Lights (ON)
 Average Daily Load Profile



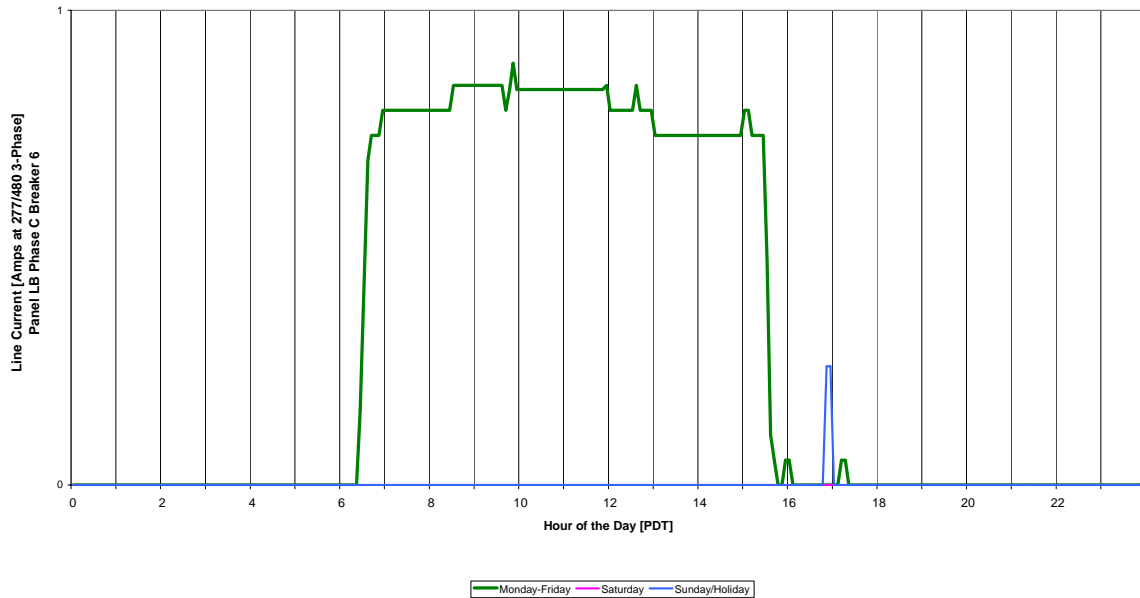
The load profile below displays the operating behavior of the set of fixtures from this warehouse which are used less frequently. The lights are seen to be on during the early morning and are gradually turned off as the day progresses. This load profile demonstrates that the staff's claim to have initiated behavioral changes was factual. The full load equivalent operating hours is 1955 hours per year for this set of lights.



Based upon the 80% shut-off rate, the equivalent main warehouse operating hours are 2,072 hours per year ($1955 \times 0.8 + 2538 \times 0.2$). This value was used for the post-retrofit operating hours of the main warehouse lights and was highlighted in green. The original 2538 h/yr value was used for the post-retrofit operating hours since the staff did not control the lights prior to the energy efficiency work.

North Warehouse: The north warehouse lights are on from 7:00 a.m. until 4:00 p.m. The graph below shows that this area has a very small load. This results in a full load equivalent operating time of 1907 hours per year.

North Services Agency October/November 2003
 N. Warehouse Shop Lights (ON)
 Average Daily Load Profile



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. If a value in the contractor’s spreadsheet was verified by our metering or was changed by less than 1% because of our metering, it was highlighted in light blue. If a value in the contractor’s spreadsheet was changed by more than 1% because of our metering, it was highlighted in tan. If a value in the contractor’s spreadsheet was changed by more than 1% for a reason other than metering (direct observation, discussion with local personnel, etc.), it was highlighted in yellow. Numbers that were not changed from the contractor’s values were not changed. This was the situation where measurements were unnecessary (such as exit lights) or not practical (such as a small seldom-used closet).

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

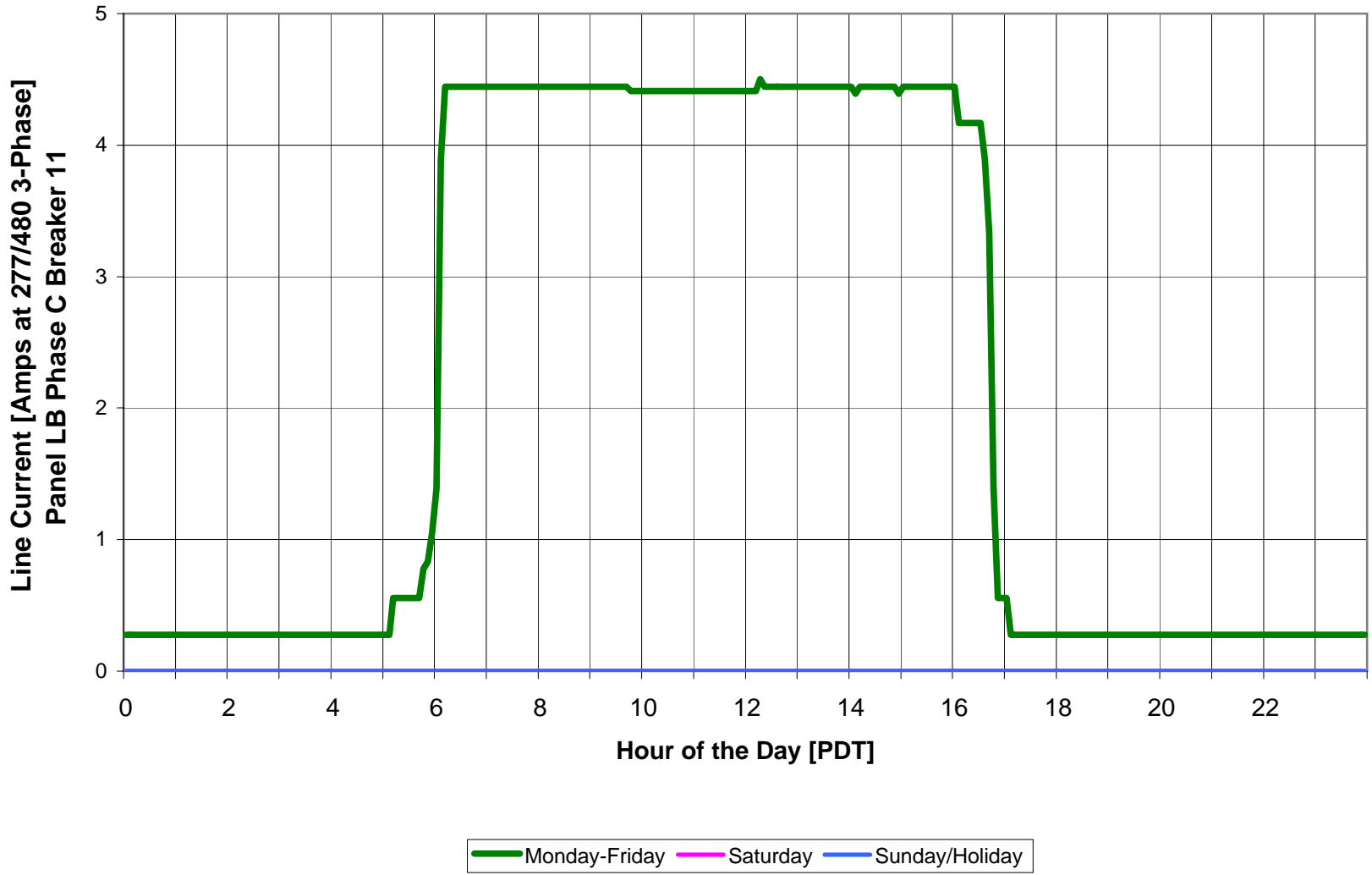
The following table delineates the savings at this site for each of the measure types included in the program.

North Services Agency – Service Building Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights						
T12 to T8	311	100,818	316	123,017	54,551	99,030
Inc to CFL	7	1,220	7	1,463	1,105	1,103
Total	318	102,038	323	124,480	55,656	100,133

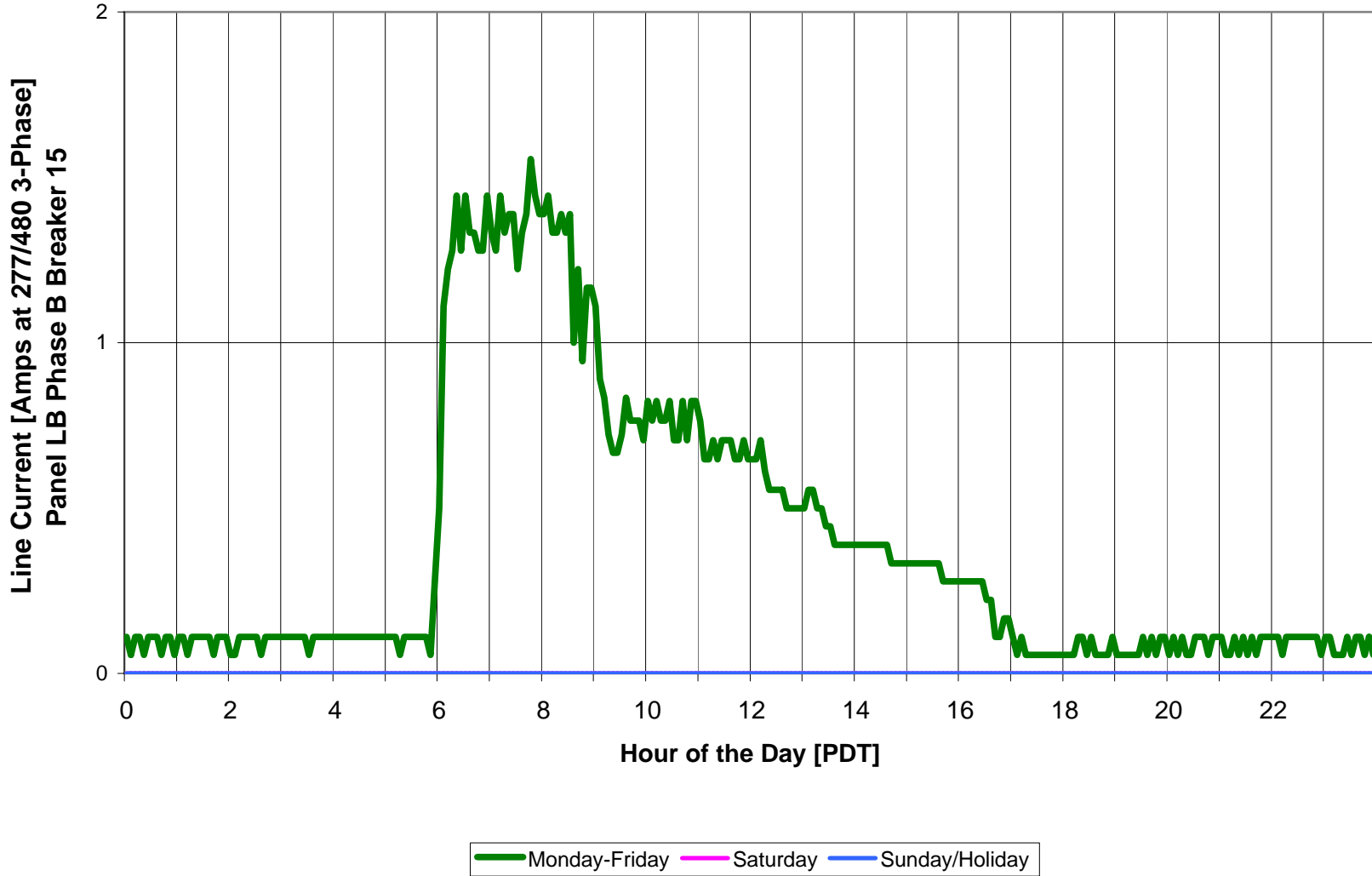
The *ex-ante* savings in this project are lower than other estimates primarily because the main warehouse contained high-output 8-foot fluorescent fixtures. The resulting retrofit saved more on a per-fixture basis than the program-wide average fluorescent retrofit. The *ex-post* estimate is approximately what the county originally estimated. The contractor’s estimate was higher because of longer assumed operating times.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

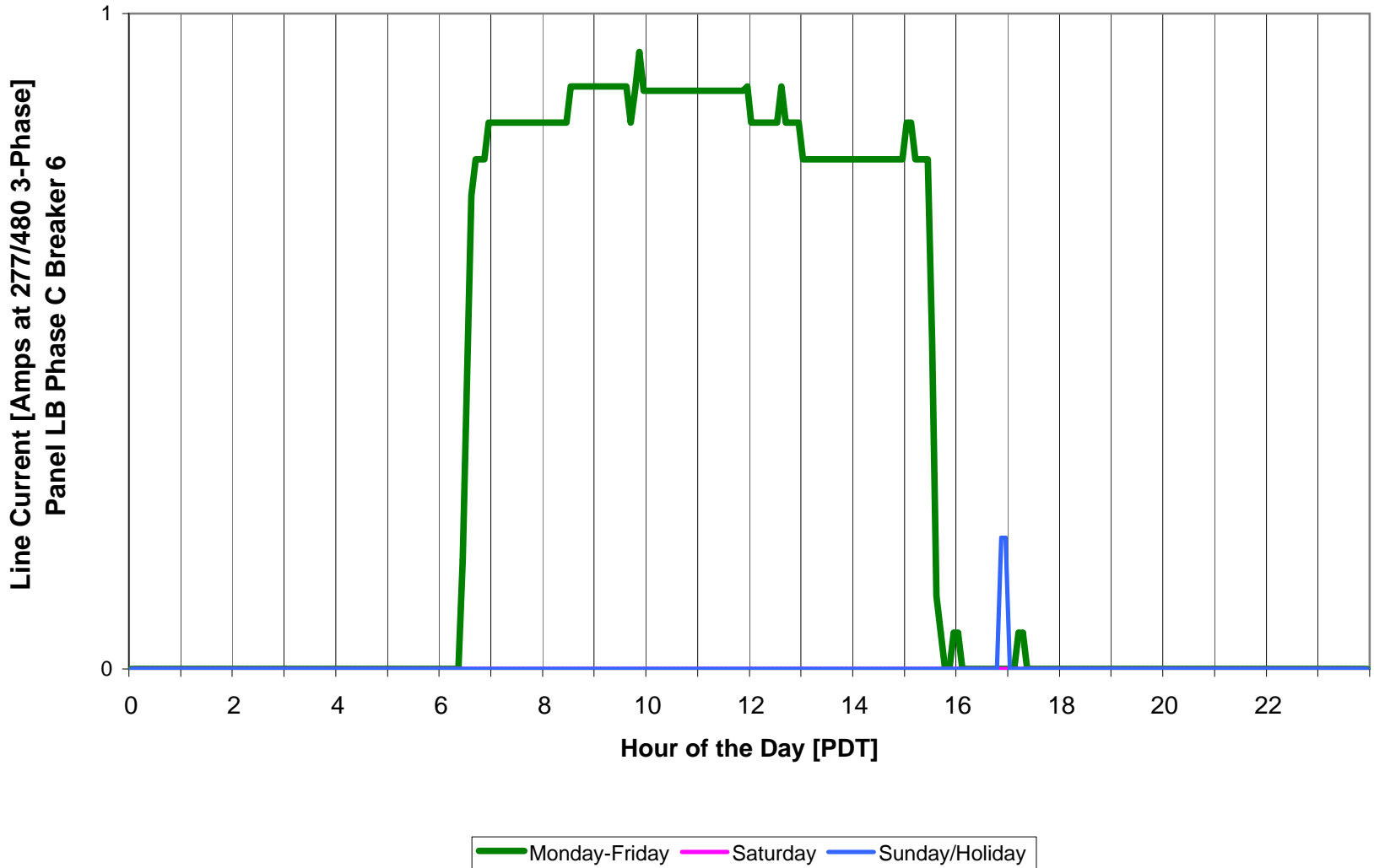
North Services Agency October/November 2003
Main Warehouse Shop Lights (ON)
Average Daily Load Profile



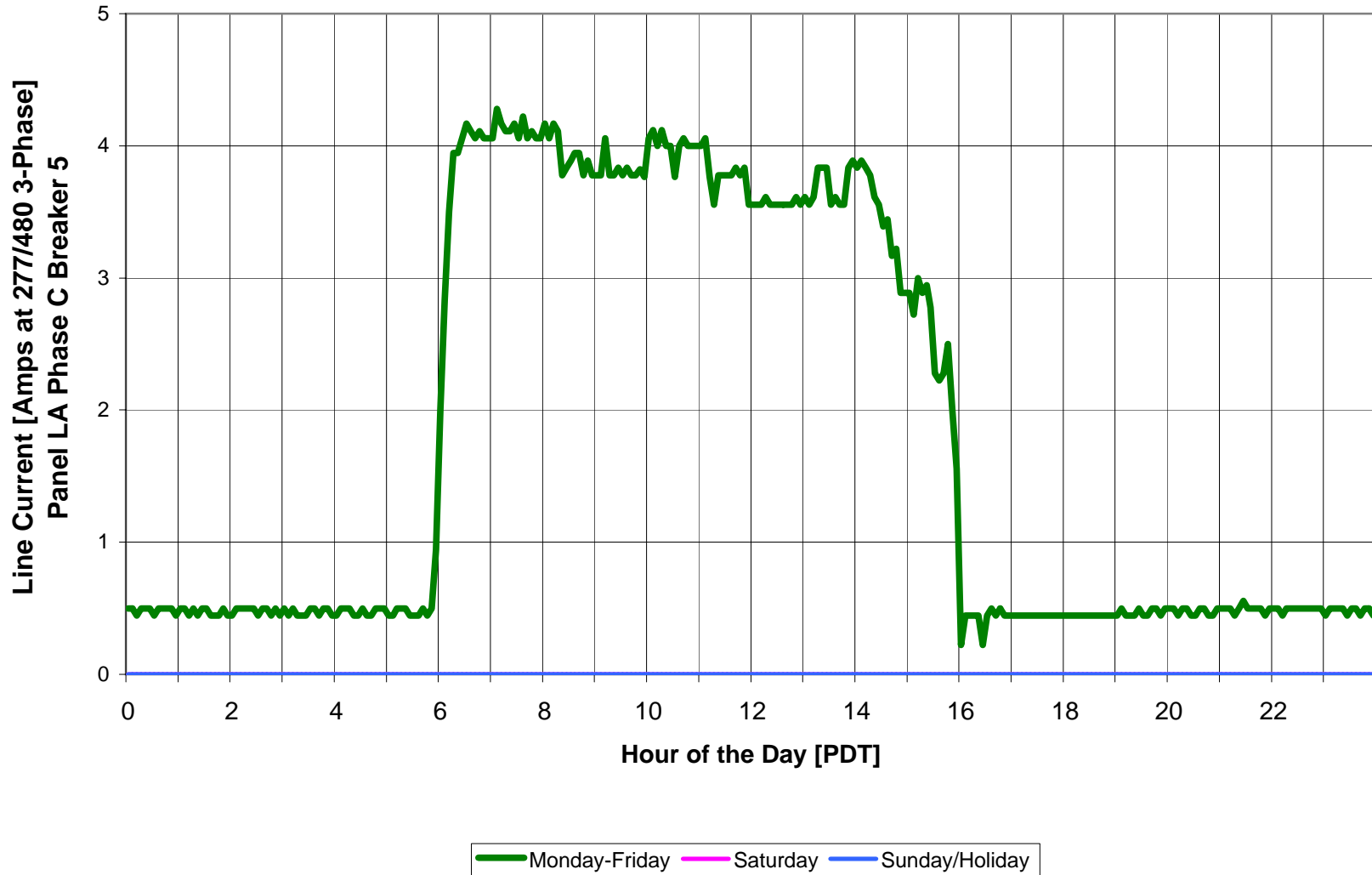
North Services Agency October/November 2003
Main Warehouse Lights (OFF)
Average Daily Load Profile



North Services Agency October/November 2003
N. Warehouse Shop Lights (ON)
Average Daily Load Profile



North Services Agency October/November 2003
Carpenter Shop Lights
Average Daily Load Profile



Contractor As-Built Savings
18. North Services Agency

		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
15	Warehouse North 2	MH250/1		1	Pendant Mount	2	295	0.59	3120	1,841			MH250/1	MH250/1	1	Metal Halide (1) 250W lamp	2	295	0.59	1,841	0.000	0
19	Paint room 2	MV250/1		1	Pendant Mount	13	290	3.77	3120	11,762			MV250/1	MV250/1	1	Pendant Mount	13	290	3.77	11,762	0.000	0
20	Wedding Shop	MV250/1		1	Pendant Mount	2	290	0.58	3120	1,810			MV250/1	MV250/1	1	Pendant Mount	2	290	0.58	1,810	0.000	0
29	Exterior	HPS100/1		1	Ceiling Mount	20	138	2.76	3120	8,611			HPS100/1	HPS100/1	1	Ceiling Mount	20	138	2.76	8,611	0.000	0
																Total HID	37				0.000	0
1	General Office	F44ES		4	2X4 Troffer	47	156	7.332	3120	22,876			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	47	102.4	4.8128	15,016	2.519	7,860
2	Hallway	F42ES		2	1X4 Troffer	3	78	0.234	3120	730			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	52.1	0.1563	488	0.078	242
3	Womens RR	F42ES		2	Ceiling Mount	4	78	0.312	3120	973			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	52.1	0.2084	650	0.104	323
4	Mens RR	F42ES		2	Ceiling Mount	2	78	0.156	3120	487			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	2	52.1	0.1042	325	0.052	162
6	Kitchen	FU2ES		2	2x2 Ceiling Mount	3	78	0.234	3120	730			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	52.1	0.1563	488	0.078	242
7	Conference Room	F44ES		4	2X4 Troffer	4	156	0.624	3120	1,947			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.4096	1,278	0.214	669
8	Warehouse North	F82SHE		1	Pendant Mount 8 ft	72	237	17.064	3120	53,240			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	72	52.1	3.7512	11,704	13.313	41,536
9	Warehouse Shops	F82SHE		2	Pendant Mount 8 ft	112	237	26.544	3120	82,817			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	112	102.4	11.4688	35,783	15.075	47,035

Contractor As-Built Savings
18. North Services Agency

Contractor As-Built Savings																						
		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
10	Wood Shop	F82SHE		2	Pendant Mount 8 ft	23	237	5.451	3120	17,007			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	23	102.4	2.3552	7,348	3.096	9,659
11	Mens RR	F42ES		2	Ceiling Mount	4	78	0.312	3120	973			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	4	52.1	0.2084	650	0.104	323
13	Warehouse Office	F84SHE		4	Pendant Mount 8 ft	2	474	0.948	3120	2,958			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	4	52.1	0.2084	650	0.740	2,308
14	Network Room/office	F24SS		2	Ceiling Mount	4	112	0.448	3120	1,398			F44ILL	2LEB-LW	4	Fluorescent, (2) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.4096	1,278	0.038	120
17	Plumbing Shop	F44ES		4	Ceiling Mount	2	156	0.312	3120	973			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334
18	Paint room	F44ES		4	Ceiling Mount	2	156	0.312	3120	973			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334
21	Wood Shop office	F84SHE		4	Pendant Mount 8 ft	1	474	0.474	3120	1,479			F84ILL	8LEB-LW	4	Fluorescent, (4) 96" T'lamp, Instant Start Ballast, RLO (BF<0.85)	1	218.6	0.2186	682	0.255	797
22	Wood Shop Storage	F42ES		2	Ceiling Mount	2	78	0.156	3120	487			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	52.1	0.1042	325	0.052	162
23	Special Districts	F82SHE		2	Pendant Mount 8 ft	6	237	1.422	3120	4,437			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.6144	1,917	0.808	2,520
24	Aquatics Office	F42ES		2	Ceiling Mount	1	78	0.078	3120	243			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	163	0.026	81
25	Aquatics Office 2	F44ES		4	Ceiling Mount	1	156	0.156	3120	487			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
26	Electrical Office	F44ES		4	Ceiling Mount	1	156	0.156	3120	487			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
27	Concrete Office	F44ES		4	Ceiling Mount	2	156	0.312	3120	973			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334

Contractor As-Built Savings
18. North Services Agency

Contractor As-Built Savings																						
		Existing Fixtures										New Fixtures								Savings		
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/ year
28	Locksmith Office	F44ES		4	Ceiling Mount	2	456	0.912	3120	2,845			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.707	2,206
31	Patrol Boat Shop	F82SHE		2	Pendant Mount 8 ft	9	237	2.133	3120	6,655			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	9	102.4	0.9216	2,875	1.211	3,780
32	Shop Room	F44ES		4	2X4 Troffer	2	156	0.312	3120	973			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	639	0.107	334
32	Compressor Room	F44ES		4	2X4 Troffer	1	156	0.156	3120	487			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	319	0.054	167
32	Electrical Room	F82SHE		2	2X4 Troffer	2	237	0.474	3120	1,479			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T'lamp, Instant Start Ballast, RLO (BF<0.85)	2	52.1	0.1042	325	0.370	1,154
																Total T12-T8	316				39.429	123,017
5	Mens RR/storate	I175/1		1	Ceiling Mount	1	75	0.075	3120	234			CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.042	131
12	Mens RR/Storage	I75/1		1	Ceiling Mount	1	75	0.075	3120	234			CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.042	131
16	Warehouse North 2	I150/1		1	Pendant Mount	1	150	0.15	3120	468			CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	1	33	0.033	103	0.117	365
30	Canopy Front	I100/1		1	Ceiling Mount	4	100	0.4	3120	1,248			CFQ26/1SCW	CFQ26/1S CW	1	Compact Fluorescent, quad (1) 26W Lamp	4	33	0.132	412	0.268	836
																Total INCAN	7				0.469	1,463
					Total	358		75.424		235,323						Total Fixtures	360		35.5265	110,843	39.90	124,480

Aloha Systems Measured Savings
18. North Services Agency

		Existing Fixtures										New Fixtures										Savings	
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Hours Before Retrofit	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Hours After Retrofit	Total kWh/yr	kW	kWh/ year
15	Warehouse North 2	MH250/1		1	Pendant Mount	0	295	0	3120	0			MH250/1	MH250/1	1	Metal Halide (1) 250W lamp	0	295	0	3120	0	0.000	0
19	Paint room 2	MV250/1		1	Pendant Mount	0	290	0	3120	0			MV250/1	MV250/1	1	Pendant Mount	0	290	0	3120	0	0.000	0
20	Wedding Shop	MV250/1		1	Pendant Mount	0	290	0	3120	0			MV250/1	MV250/1	1	Pendant Mount	0	290	0	3120	0	0.000	0
29	Exterior	HPS100/1		1	Ceiling Mount	0	138	0	3120	0			HPS100/1	HPS100/1	1	Ceiling Mount	0	138	0	3120	0	0.000	0
																Total HID	0					0.000	0
1	General Office	F44EE- F44SE		4	2X4 Troffer	47	165	7.755	3120	24,196			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	47	102.4	4.8128	3120	15,016	2.942	9,180
2	Hallway	F42EE- F42SE		2	1X4 Troffer	3	83	0.2475	3120	772			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	52.1	0.1563	3120	488	0.091	285
3	Womens RR	F42EE- F42SE		2	Ceiling Mount	4	83	0.33	3120	1,030			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	52.1	0.2084	3120	650	0.122	379
4	Mens RR	F42EE- F42SE		2	Ceiling Mount	2	83	0.165	3120	515			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	2	52.1	0.1042	3120	325	0.061	190
6	Kitchen	FU2ES		2	2x2 Ceiling Mount	3	78	0.234	3120	730			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	3	52.1	0.1563	3120	488	0.078	242
7	Conference Room	F44EE- F44SE		4	2X4 Troffer	4	165	0.66	3120	2,059			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.4096	3120	1,278	0.250	781
8	Warehouse North	F82SHE		1	Pendant Mount 8 ft	72	237	17.064	1907	32,541			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	72	52.1	3.7512	1907	7,154	13.313	25,388
9	Warehouse Shops	F82SHE		2	Pendant Mount 8 ft	112	237	26.544	2538	67,369			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T"lamp, Instant Start Ballast, RLO (BF<0.85)	112	102.4	11.4688	2072	23,763	15.075	43,605

Aloha Systems Measured Savings
18. North Services Agency

		Existing Fixtures										New Fixtures										Savings	
Item	AREA / Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Hours Before Retrofit	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Proposed Retrofit or Replacement	# of Fixtures	Watts per Fixture	Total kW	Hours After Retrofit	Total kWh/yr	kW	kWh/ year
10	Wood Shop	F82SHE		2	Pendant Mount 8 ft	23	237	5.451	2637	14,374			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	23	102.4	2.3552	2637	6,211	3.096	8,164
11	Mens RR	F42EE- F42SE		2	Ceiling Mount	4	83	0.33	2637	870			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	4	52.1	0.2084	2637	550	0.122	321
13	Warehouse Office	F84SHE		4	Pendant Mount 8 ft	2	474	0.948	2637	2,500			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	4	52.1	0.2084	2637	550	0.740	1,950
14	Network Room/office	F24SS		2	Ceiling Mount	4	112	0.448	2637	1,181			F44ILL	2LEB-LW	4	Fluorescent, (2) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	4	102.4	0.4096	2637	1,080	0.038	101
17	Plumbing Shop	F44EE- F44SE		4	Ceiling Mount	2	165	0.33	2637	870			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	2637	540	0.125	330
18	Paint room	F44EE- F44SE		4	Ceiling Mount	2	165	0.33	2637	870			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	2637	540	0.125	330
21	Wood Shop office	F84SHE		4	Pendant Mount 8 ft	1	474	0.474	2637	1,250			F84ILL	8LEB-LW	4	Fluorescent, (4) 96" T1lamp, Instant Start Ballast, RLO (BF<0.85)	1	218.6	0.2186	2637	576	0.255	673
22	Wood Shop Storage	F42EE- F42SE		2	Ceiling Mount	2	83	0.165	2637	435			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	2	52.1	0.1042	2637	275	0.061	160
23	Special Districts	F82SHE		2	Pendant Mount 8 ft	6	237	1.422	2637	3,750			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	6	102.4	0.6144	2637	1,620	0.808	2,130
24	Aquatics Office	F42EE- F42SE		2	Ceiling Mount	1	83	0.0825	2637	218			F42ILL	2LEB-LW	2	Fluorescent, (2) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	1	52.1	0.0521	2637	137	0.030	80
25	Aquatics Office 2	F44EE- F44SE		4	Ceiling Mount	1	165	0.165	2637	435			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	2637	270	0.063	165
26	Electrical Office	F44EE- F44SE		4	Ceiling Mount	1	165	0.165	2637	435			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	1	102.4	0.1024	2637	270	0.063	165
27	Concrete Office	F44EE- F44SE		4	Ceiling Mount	2	165	0.33	2637	870			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	2637	540	0.125	330
28	Locksmith Office	F44EE- F44SE		4	Ceiling Mount	2	165	0.33	2637	870			F44ILL	4LEB-LW	4	Fluorescent, (4) 48" T1lamp, Instant Start Ballast, RLO (BF<0.85)	2	102.4	0.2048	2637	540	0.125	330

Castaic North Services Agency, Service Building – 31320 N. Castaic



Castaic North Services Building Front



Restroom 2-lamp Surface Mount Fixture



4-lamp Office Light Fixture, ES Ballasts



4-lamp Office Light Fixtures (40 Watt Lamps)



Woodshop Old T12HO Fixtures



Shipping Warehouse Old T12HO Fixtures

Castaic North Services Agency, Service Building – 31320 N. Castaic



Main Warehouse Old T12HO Fixtures



Close Up Photo Of 2-lamp Old T12HO Fixtures



Kitchen U-Bend Fixtures



Kitchen U-Bend Fixtures



Kitchen U-Bend Fixture Electronic Ballast



Warehouse Storage Area HID Fixtures

Castaic North Services Agency, Service Building – 31320 N. Castaic



**Panel LA in Main Vault with Datalogger
Installed**



**Panel LB in Main Vault with Dataloggers
Installed**

Site Measurement and Verification Report

Site Number 19

Rio Hondo Courts Parking Structure

11228 Valley Blvd., El Monte

SCE Account 3-011-6567-58

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	20,678 kWh
Contractor's As-Built Estimate	22,641 kWh
<i>Ex-Ante</i> Evaluation	23,242 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	37,126 kWh

Site Description

The Rio Hondo Courts parking structure consists of two levels. The first level is a closed parking area at street level where most of the lights are located. The second level is an open, uncovered parking area that did not have lights retrofitted. The parking structure is operational seven days a week.

Preliminary Site Visit

During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent lamps.

Post-Retrofit Audit

We specifically re-verified the observations noted during the preliminary site visit. The T-12 fluorescent lights were replaced with T-8 fluorescent lighting. The exit signs were also replaced with LED exit signs.

Metered Operating Hours

A lighting logger was installed in one of the fixtures. The logger recorded consistent operation between 4:51 a.m. and 9:51 p.m. each day, seven days per week. This 17 hour per day operation amounts to 6,205 hours per year.

Staff report that approximately half of the lights are controlled by this timer and the other half operate continuously, 8760 hours per year. Using a 50% timed ratio, the average parking lot light therefore operates 7,483 hours per year. This value was used as the operating time for the replacement fluorescent fixtures.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

Rio Hondo Parking Structure Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights			7	2,330	2,526	2,330
T12 to T8	139	20,678	120	20,311	20,715	34,796
Inc to CFL						
Total	139	20,678	127	22,641	23,242	37,126

The *ex-post* measured estimate is higher than either the *ex-ante* calculation or the preliminary savings estimates because the lights in this structure operate for much longer periods of time than had been assumed.

Contractor As-Built Savings
19. Rio Hondo Parking Structure

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
4	Parking Structure	MH250/4	4 Head Pole lights	4 EA.	High Pressure Sod. 250w	0	1180	0.000	4368	0	Existing Time Clock	No Work	F44ILL-R		4	No Work	0	1.18	0.000	0	0.000	0
5	Parking Structure	MH250/2	2 Head Pole lights	2 EA.	High Pressure Sod. 250w	0	590	0.000	4368	0	Existing Time Clock	No Work	F42ILL-R		2	No Work	0	0.59	0.000	0	0.000	0
																Total HID	0				0.000	0
6	Parking Structure	E40/1	Surface Mount	1 EA.	Exit Sign	7	40	0.280	8760	2,453		Replace	ELED2/1		1	New LED Thermoplastic Exit Sign	7	0.002	0.014	123	0.266	2,330
																Total Exit	7				0.266	2,330
1	Parking Structure	F44EE	Pendant Mount	4 EA.	1-34w T12 1x8 wrap	84	144	12.096	4368	52,835	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast	84	0.102	8.568	37,425	3.528	15,410
2	Parking Structure	F44EE	Pendant Mount	4 EA.	1-34w T12 1x8 wrap	7	144	1.008	4368	4,403	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast, New Ballast Pan, Surface Mount, Add Wire Guard	7	0.102	0.714	3,119	0.294	1,284
2.5	Parking Structure	F42EE	Pendant Mount	2 EA.	1-34w T12 1x4 wrap	2	72	0.144	4368	629	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast, New Ballast, Surface Mount, Add Wire Guard	2	0.052	0.104	454	0.040	175
3.0	Parking Structure	F42EE	Pendant Mount	2 EA.	1-34w T12 1x4 wrap	14	72	1.008	4368	4,403	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast	14	0.052	0.728	3,180	0.280	1,223
7	Office	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	4	72	0.288	4368	1,258	Existing Time Clock	Replace	F42ILL-R		2	Install new 1x8 4-32W T8 Wrap	2	0.102	0.204	891	0.084	367
8	Office	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	1	72	0.072	4368	314	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast	1	0.052	0.052	227	0.020	87

Contractor As-Built Savings
19. Rio Hondo Parking Structure

		Existing Fixtures										New Fixtures								Savings						
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen., & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr				
9	Storage	F44EE	Surface Mount	4 EA.	1-34w T12 1x8 wrap	3	144	0.432	4368	1,887	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast	3	0.102	0.306	1,337	0.126	550				
10	Storage	F44EE	Surface Mount	4 EA.	1-34w T12 1x8 wrap	1	144	0.144	4368	629	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast, Re-Hang Fixture	1	0.102	0.102	446	0.042	183				
11	Electrical Rm.	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	1	72	0.072	4368	314	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast	1	0.052	0.052	227	0.020	87				
12	Parking Structure	F42EE	Surface Mount	2 EA.	1" Box 75 W	3	75	0.225	4368	983	Existing Time Clock	Replace	F42ILL-R		2	New Water Resistant Ceiling Mount CF Fixture	3	0.031	0.093	406	0.132	577				
13	Storage (missed on original)	F44EE	Surface Mount	4 EA.	1-34w T12 1x8 wrap	2	144	0.288	4368	1,258	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast	2	0.102	0.204	891	0.084	367				
14	Parking Structure	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	0	72	0.000	4368	0	Existing Time Clock	Replace	F42ILL-R		2	Install new 1x4 2-32W T8 Wrap	0	0.052	0.000	0	0.000	0				
																Total T12-T8	120				4.650	20,311				
Total						129		16.057		71,367											Total	127	11.141	48,725	4.916	22,641

Aloha Systems Measured Savings
19. Rio Hondo Parking Structure

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
4	Parking Structure	MH250/4	4 Head Pole lights	4 EA.	High Pressure Sod. 250w	0	1180	0.000	4368	0	Existing Time Clock	No Work	F44ILL-R		4	No Work	0	1180	0.000	0	0.000	0
5	Parking Structure	MH250/2	2 Head Pole lights	2 EA.	High Pressure Sod. 250w	0	590	0.000	4368	0	Existing Time Clock	No Work	F42ILL-R		2	No Work	0	590	0.000	0	0.000	0
																Total HID	0				0.000	0
6	Parking Structure	E40/1	Surface Mount	1 EA.	Exit Sign	7	40	0.280	8760	2,453		Replace	ELED2/1		1	New LED Thermoplastic Exit Sign	7	2	0.014	123	0.266	2,330
																Total Exit	7				0.266	2,330
1	Parking Structure	F44EE	Pendant Mount	4 EA.	1-34w T12 1x8 wrap	84	144	12.096	7483	90,514	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast	84	102	8.568	64,114	3.528	26,400
2	Parking Structure	F44EE	Pendant Mount	4 EA.	1-34w T12 1x8 wrap	7	144	1.008	7483	7,543	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast, New Ballast Pan, Surface Mount, Add Wire Guard	7	102	0.714	5,343	0.294	2,200
2.5	Parking Structure	F42EE	Pendant Mount	2 EA.	1-34w T12 1x4 wrap	2	72	0.144	7483	1,078	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast, Surface Mount, Add Wire Guard	2	52	0.104	778	0.040	299
3.0	Parking Structure	F42EE	Pendant Mount	2 EA.	1-34w T12 1x4 wrap	14	72	1.008	7483	7,543	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast	14	52	0.728	5,448	0.280	2,095
7	Office	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	4	72	0.288	7483	2,155	Existing Time Clock	Replace	F42ILL-R		2	Install new 1x8 4-32W T8 Wrap	2	102	0.204	1,527	0.084	629
8	Office	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	1	72	0.072	7483	539	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast	1	52	0.052	389	0.020	150

Aloha Systems Measured Savings
19. Rio Hondo Parking Structure

		Existing Fixtures										New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
9	Storage	F44EE	Surface Mount	4 EA.	1-34w T12 1x8 wrap	3	144	0.432	7483	3,233	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast	3	102	0.306	2,290	0.126	943		
10	Storage	F44EE	Surface Mount	4 EA.	1-34w T12 1x8 wrap	1	144	0.144	7483	1,078	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast, Re-Hang Fixture	1	102	0.102	763	0.042	314		
11	Electrical Rm.	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	1	72	0.072	7483	539	Existing Time Clock	Retrofit	F42ILL-R		2	2-32W T8 Lamps w/Low Power Ballast	1	52	0.052	389	0.020	150		
12	Parking Structure	F42EE	Surface Mount	2 EA.	* Box 75 W	3	75	0.225	7483	1,684	Existing Time Clock	Replace	F42ILL-R		2	New Water Resistant Ceiling Mount CF Fixture	3	31	0.093	696	0.132	988		
13	Storage (missed on original)	F44EE	Surface Mount	4 EA.	1-34w T12 1x8 wrap	2	144	0.288	7483	2,155	Existing Time Clock	Retrofit	F44ILL-R		4	4-32W T8 Lamps w/Low Power Ballast	2	102	0.204	1,527	0.084	629		
14	Parking Structure	F42EE	Surface Mount	2 EA.	1-34w T12 1x4 wrap	0	72	0.000	7483	0	Existing Time Clock	Replace	F42ILL-R		2	Install new 1x4 2-32W T8 Wrap	0	52	0.000	0	0.000	0		
Total T12-T8																	120				4.650	34,796		
Total						129		16.057		120,512			Total						127		11.141	83,386	4.916	37,126

Site Measurement and Verification Report

Site Number 19A
Montebello Public Library
1550 W. Beverly Blvd., Montebello
SCE Account 3-001-4065-32

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	0 kWh
Contractor's As-Built Estimate	96,551 kWh
<i>Ex-Ante</i> Evaluation	128,556 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	94,076 kWh

Site Description

The Montebello library is a single main building with a parking garage downstairs and a storage area on it's facility as well. It is 50,530 square feet. It also has a variety of small offices off of the main library area, a children's library, a kitchen, restrooms, and various small meeting rooms.

The library is open from 10:00 am to 8:00 pm Monday and Tuesday. From 10:00 am to 6:00 pm Wednesday and Thursday, and 10:00 am to 5:00 pm on Friday and Saturday. The actual operating hours might vary because library staff working during hours when the library is closed to the public.

This site was not included in the original proposal, but was able to be completed because of extra funds, including those saved by eliminating some non-cost-effective portions of other sites discovered as part of the pre-retrofit EM&V visits. Because it was not included in the original site calculations, its "proposed estimate" is zero.

Spreadsheet Errors

The spreadsheets were presented to us with direct values rather than formulas. Upon conversion to formulas, occasionally the rows did not multiply correctly and occasionally the rows did not add exactly to the reported total. Often this was the case when "no change" was reported because of the use of zero quantities. We corrected these problems by setting both the "existing" and "new" quantities to zero for any line item in which there were not fixtures changes. This will allow both the fixture and kWh sums to accurately represent the project. The purpose of the lighting spreadsheets is not to document every light in the facility, but rather to document only those that were retrofitted.

Changes made as a result of correcting the operating hours's spreadsheet errors are highlighted in lavender on Aloha's "metered" spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor's as-built spreadsheet.

Preliminary Site Visit

The site was visited on August 7, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. The facility used energy saver ballasts and 34W fluorescent tubes.

One discrepancy was discovered. In the downstairs storage room the spreadsheet had 60-watt lamps; instead we found the lamps to be 75-watt. This change was noted and highlighted in magenta on the “measured” spreadsheet.

Post-Retrofit Audit

The site was again visited on December 23, 2003. We specifically re-verified the observations noted during the preliminary site visit.

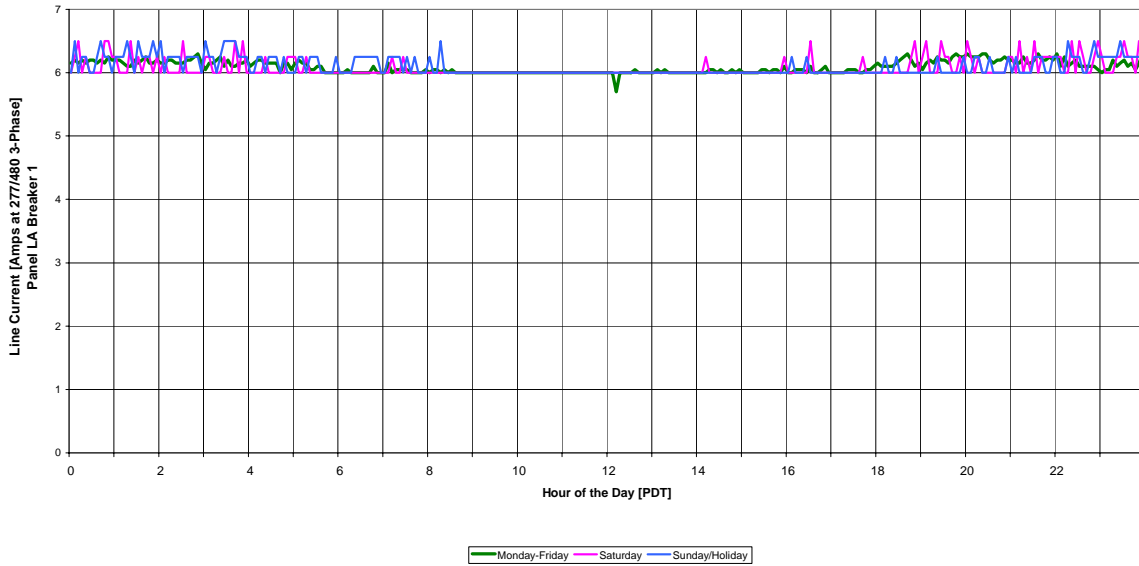
Metered Load Profiles

Although we obtained the operating hours for the library we installed data loggers to verify these hours. Especially useful is when the staff is working and the library is closed to the public. We collected interval data for lighting loads in six locations. We selected loads depending on their location or lighting load. The six lighting areas on which we collected data were:

- Parking Garage
- Main Library Area
- Children’s Area
- Work Rooms
- Exterior Linear Fluorescent Lights
- Exterior Compact Fluorescents

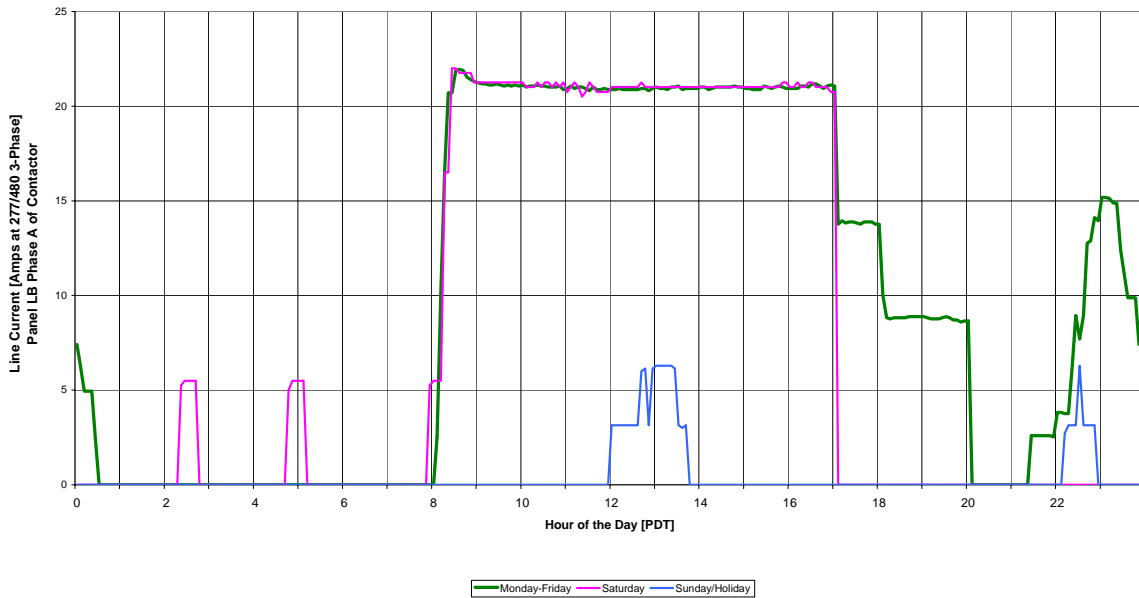
Parking Garage: The parking garage lights are operational 24 hours per day seven days per week. The load profile on the following page demonstrates this from the metered data. The equivalent operating hours are 8,760 hours per year. The contractor’s as built spreadsheet had assumed half-day operation, or 4368 hours per year for the parking garage.

Montebello Public Library December 2003/January 2004
 Parking Garage Lights
 Average Daily Load Profile

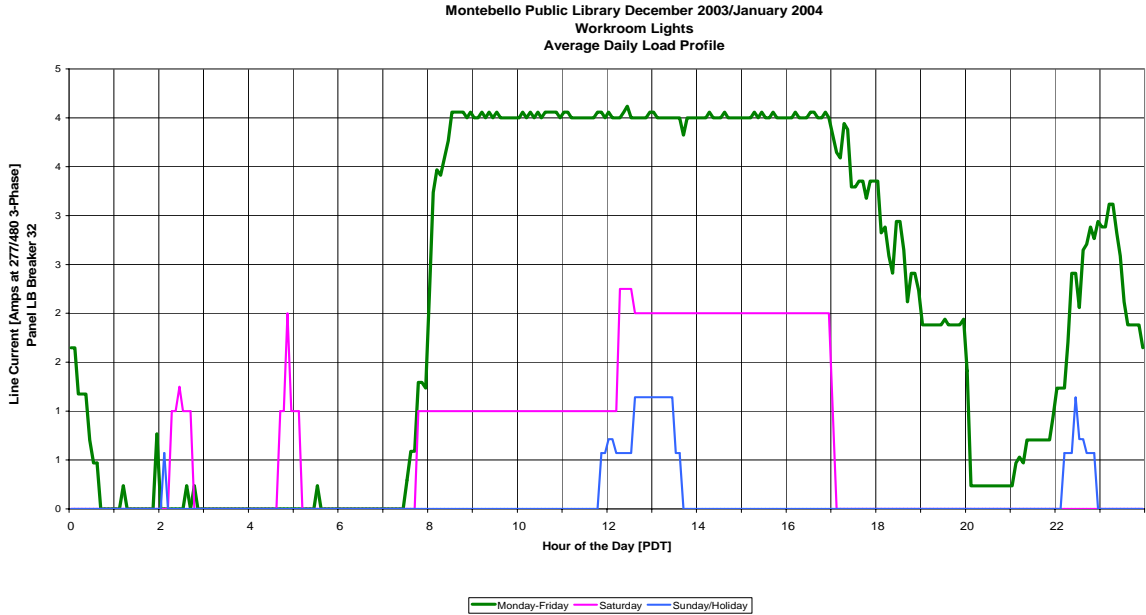


Main Area: The main area of the library demonstrated an average weekday operation from about 8:00 a.m. until about 6:30 p.m. and from 6:00 a.m. until 5:00 p.m. on Saturday. This results in an equivalent full-load operating time of 3,403 hours per year.

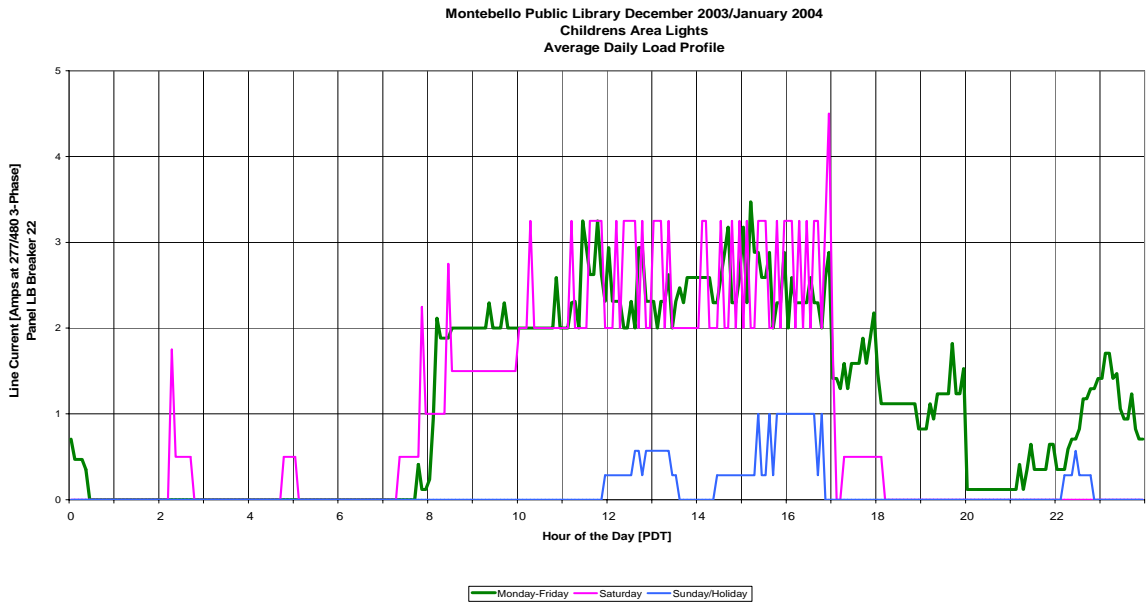
Montebello Public Library December 2003/January 2004
 Main Area Lights
 Average Daily Load Profile



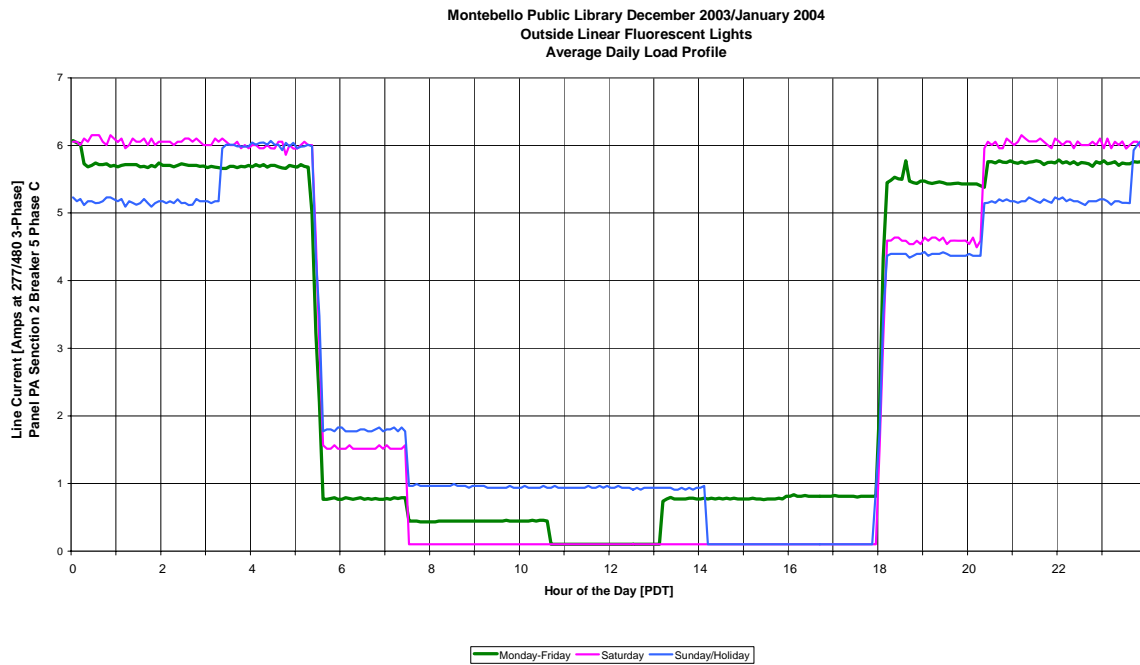
Work Room: The work room also demonstrated similar operating behavior to both the main and children's area with an average weekday operation from about 8:00 a.m. until about 6:30 p.m. This results in an equivalent full-load operating time of 3,411 hours per year. This is not significantly different from the main shelf area, so the same value of 3,403 will be used for the work areas as well.



Children's Area: The children's area of the library demonstrated similar operating behavior to the main area with an average weekday operation from about 8:00 a.m. until about 6:30 p.m. and from 6:00 a.m. until 5:00 p.m. on Saturday. An unknown stray load on the monitored circuit made exact analysis of this area difficult. The behavior pattern indicates that the area operates essentially the same time as the main library area, so the 3,403 h/yr value will be used for the children's area as well.

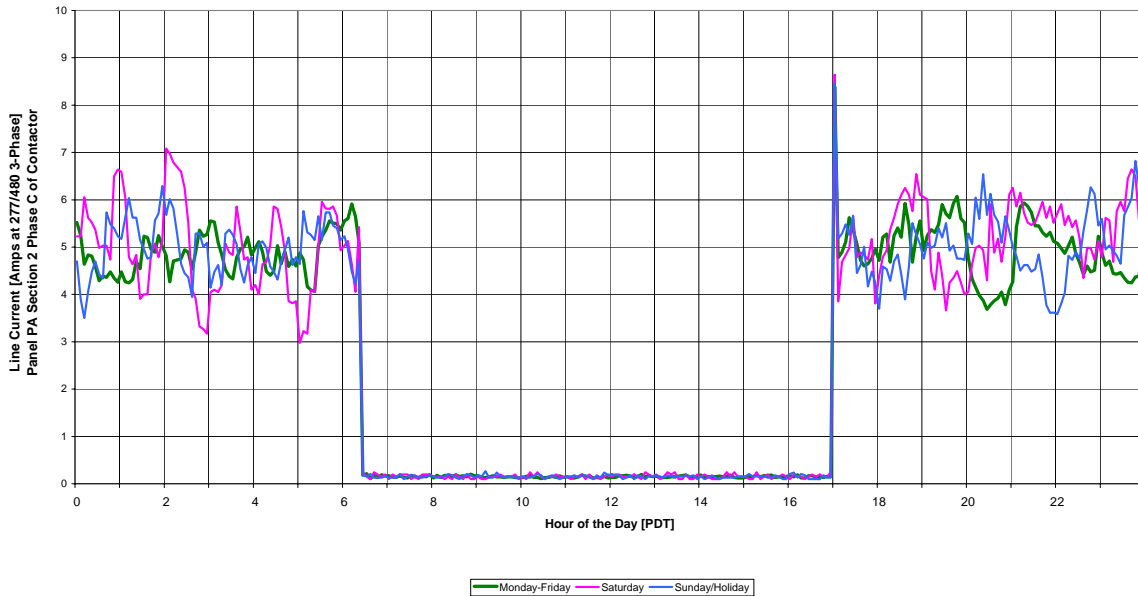


Exterior Linear Fluorescents: The load profile below represents the linear fluorescent lights on the exterior of the building. These lights are on from about 6:00 p.m. until 5:30 a.m. During the day these lights are off. The full load equivalent operating hours recorded during the monitoring period are 4,327 hours per year. While these lights generally operate during the nighttime, there were occasional days when they did not operate in the evening and/or early morning and also occasional days when they operated during the day.



Exterior Compact Fluorescents: The load profile below represents the compact fluorescent lights on the exterior of the building. In general, these lights operate similar to the linear fluorescents from about 5:00 p.m. until 6:30 a.m. During the day these lights are off. However, the nighttime load fluctuates significantly. It appears as if one or more of the photocells may be malfunctioning, causing a part of the lights to shut off sporadically. The equivalent full load operation of these lights is 3,920 hours per year.

Montebello Public Library December 2003/January 2004
 Outside Compact Fluorescent Lights
 Average Daily Load Profile



Operating hour values in the spreadsheets were changed in accordance with our metering discoveries. The majority of the library was assigned the 3,403 hour/year value found for the main floor and verified as very similar for the workrooms and children’s area. The parking garage was assigned continuous operation (8760) as verified, and the outside lights were assigned their operating times as metered. These changes were highlighted in tan. A few storage areas were assigned 520 h/yr operation and highlighted in yellow.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. The Aloha *ex-post* savings are derived from our actual metered data and other estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

Montebello Public Library Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit						
Exit Lights			12	503	4,331	1,367
T12 to T8			662	70,019	114,280	73,084
Inc to CFL			63	26,029	9,945	19,625
Total	0	0	737	96,551	128,556	94,076

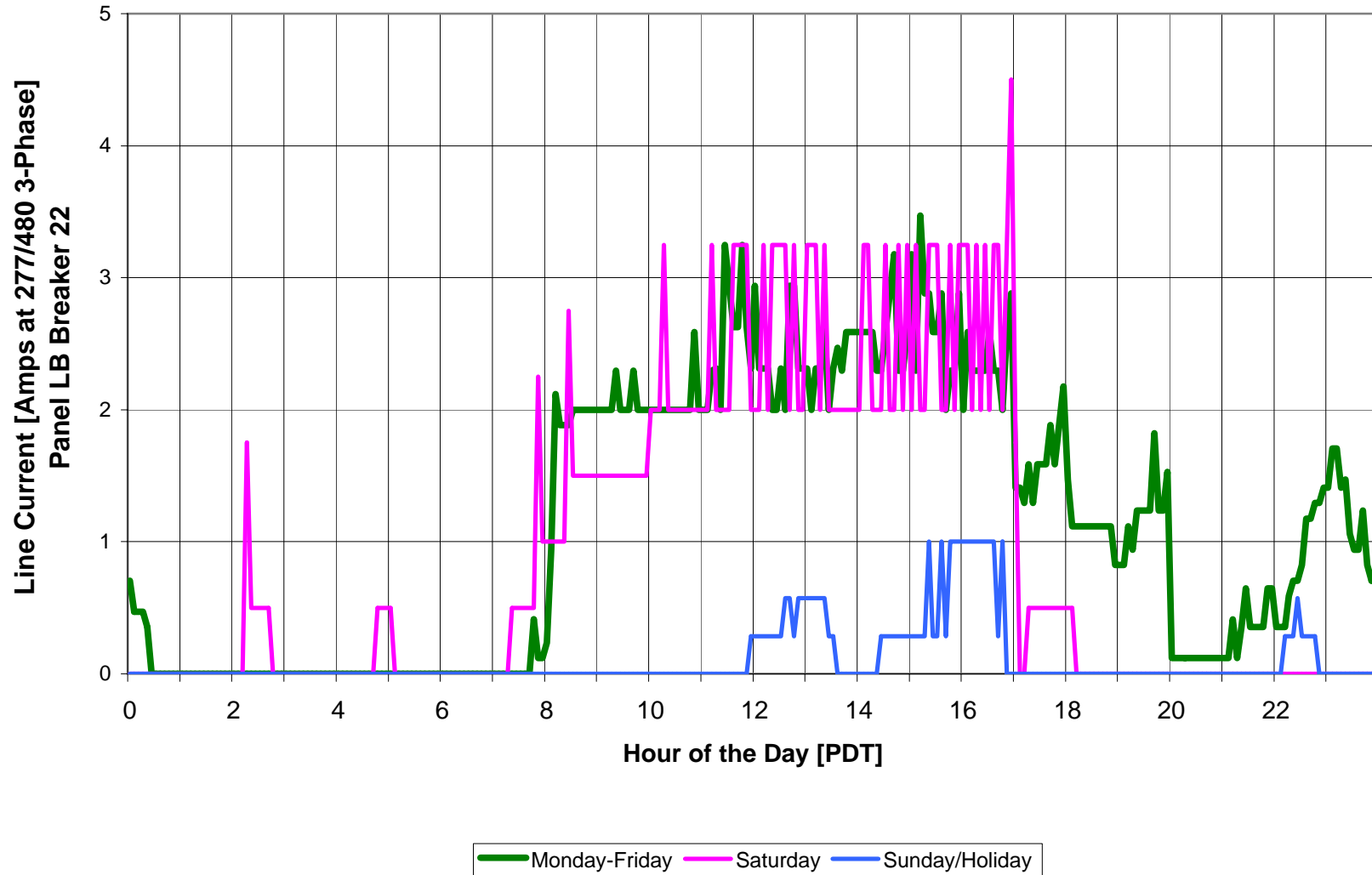
The “proposed” savings is zero because this site was not included in the original plan from which the program’s proposed energy savings were calculated. It is a true bonus addition to the program achievable because of strategic management of the program as it progressed.

The verified *ex-post* metered savings estimate is similar to the contractor’s estimate. The contractor’s T8 estimate was slightly lower because the operating times assumed (3,172 for the common areas) were slightly lower than the 3,403 h/yr operating times monitored. The contractor’s CFL estimate was significantly higher because it used the generic 3172 number for closets and storage rooms and because they assumed full-load nighttime operation for the exterior CFLs.

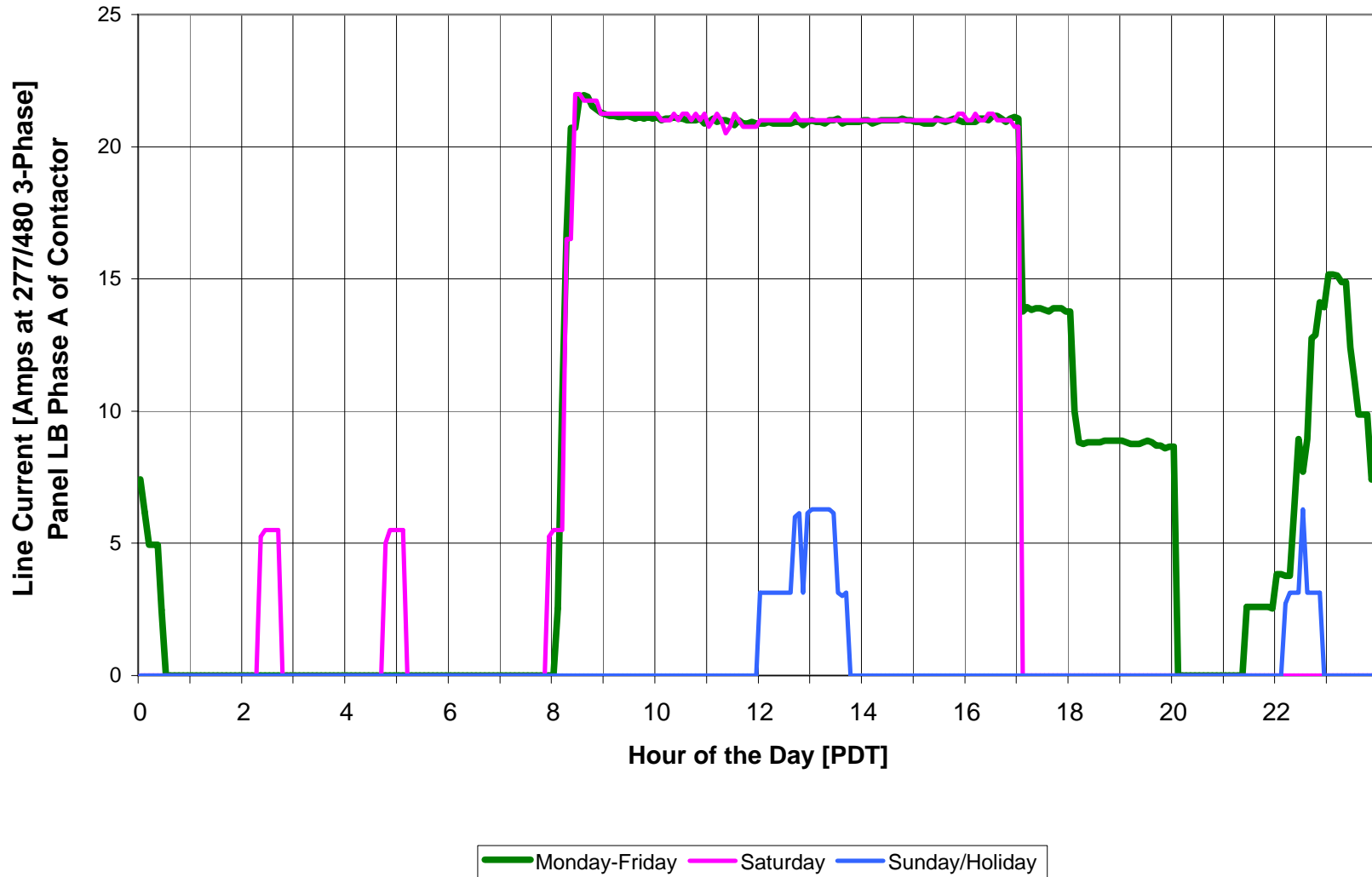
The *ex-ante* estimate is much higher than the others because the system-wide average per-fixture savings for a T8 fixture was significantly higher than that observed at this location.

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

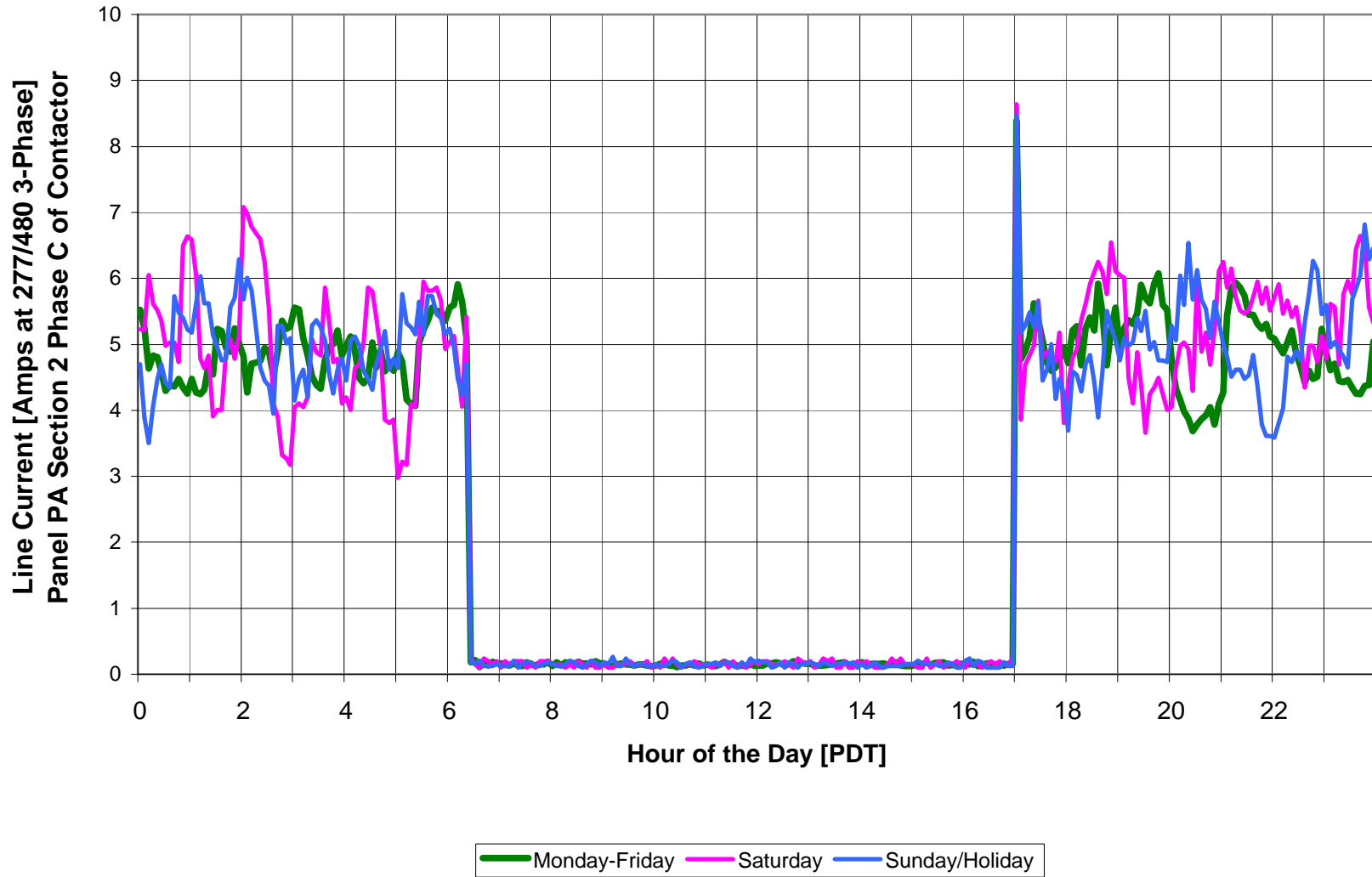
Montebello Public Library December 2003/January 2004
Childrens Area Lights
Average Daily Load Profile



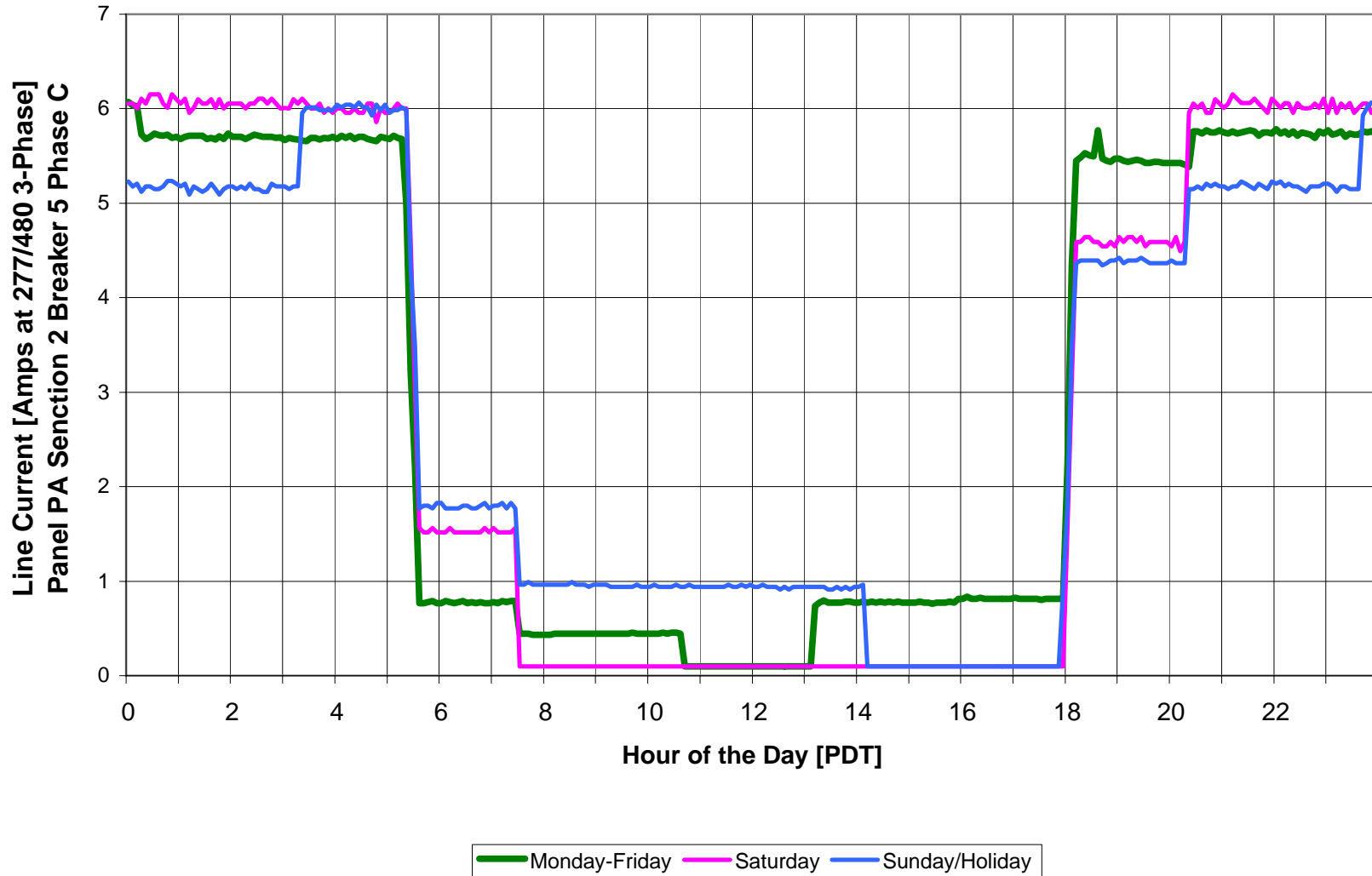
Montebello Public Library December 2003/January 2004
Main Area Lights
Average Daily Load Profile



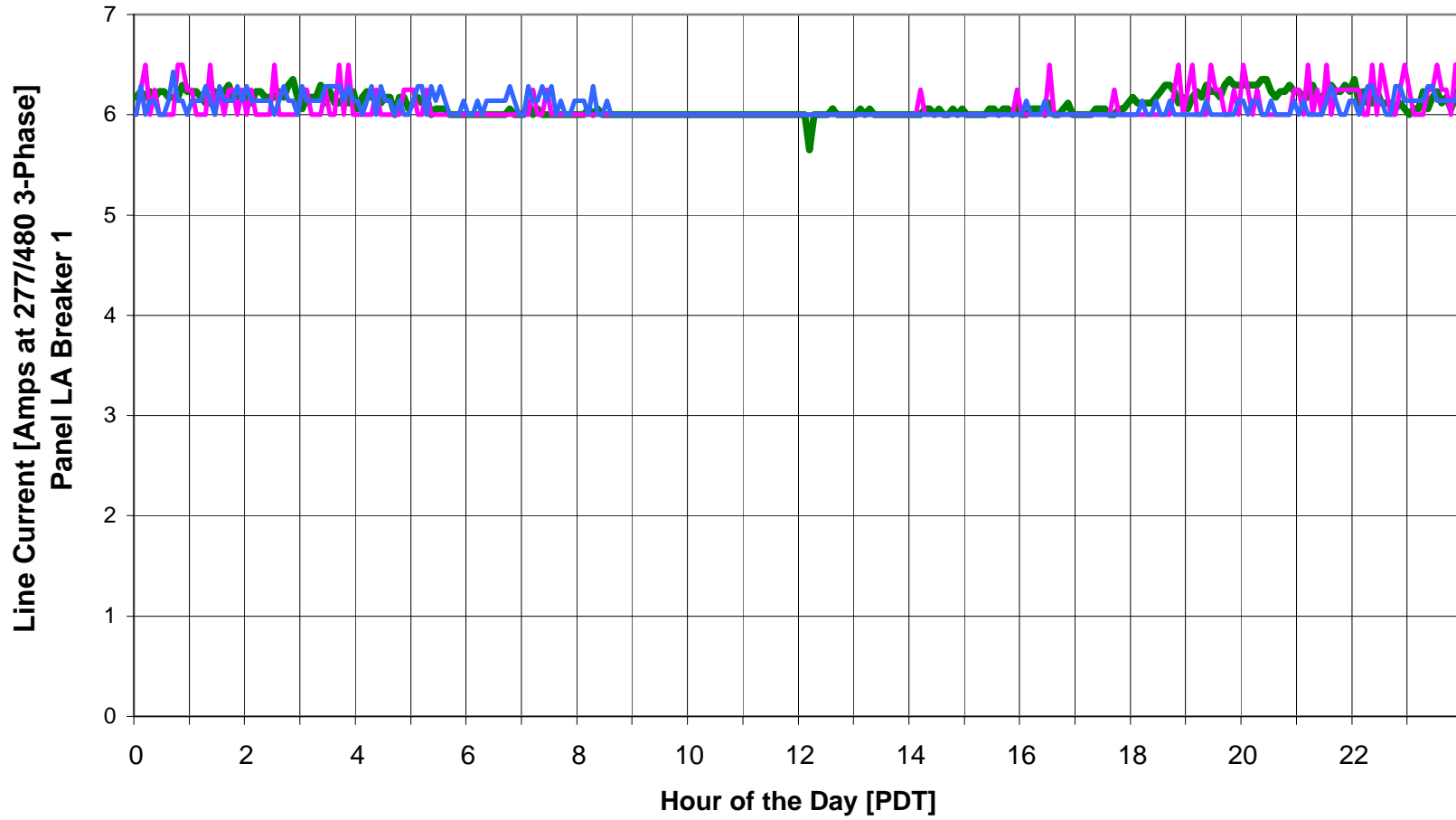
Montebello Public Library December 2003/January 2004
Outside Compact Fluorescent Lights
Average Daily Load Profile



Montebello Public Library December 2003/January 2004
Outside Linear Fluorescent Lights
Average Daily Load Profile

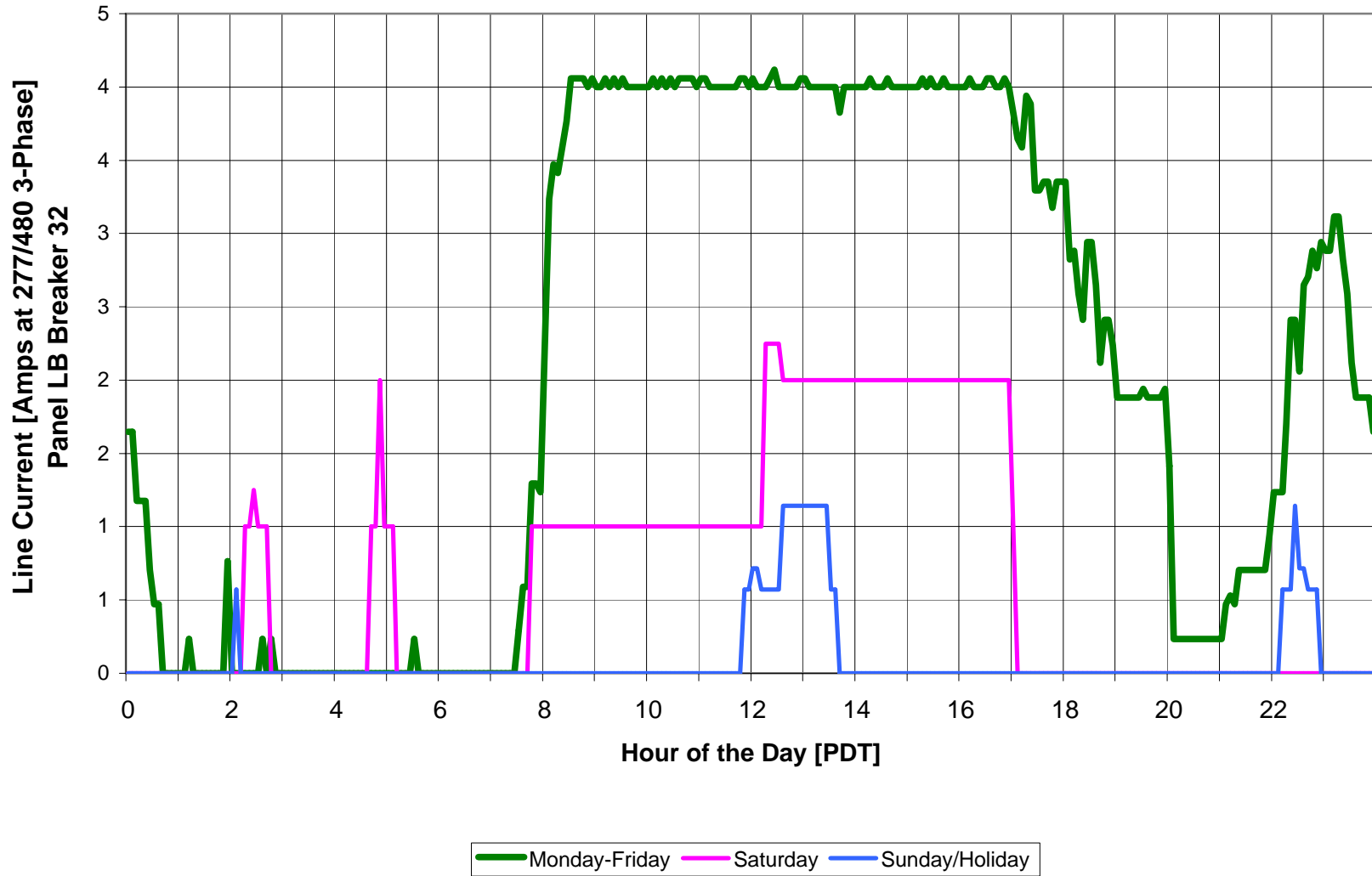


Montebello Public Library December 2003/January 2004
Parking Garage Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

Montebello Public Library December 2003/January 2004
Workroom Lights
Average Daily Load Profile



Contractor As-Built Savings
19A. Montebello Public Library

Contractor As-Built Savings																						
		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
45	Garage	HPS	HPS NO CHANGE				0	0.00	4368	0		No Retrofit	HPS		0	No Retrofit	0	0	0.00	0	0.000	0
45	Garage	HPS	HPS NO CHANGE				0	0.00	4368	0		No Retrofit	HPS		0	No Retrofit	0	0	0.00	0	0.000	0
																Total HID	0				0.000	0
44	Exit signs	EXIT	Varied			12	15	0.18	3224	580		Retrofit	EXIT		1	EXIT Light Emmitting Diode, 2W lamp, Dual Sided	12	2	0.02	77	0.156	503
																Total EXITS	12				0.156	503
1	CLM office	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.576	3172	1827	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.4096	1299.2512	0.1664	527.8208
3	Outer Office	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3172	457	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	324	0.042	133
4	Staff Work Room	F44EE	2 x 4 troffer	4	34w F40T12	18	144	2.59	3172	8,222	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	18	102	1.84	5,847	0.749	2,375
5	Closet	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	3172	228	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	162	0.021	67
6	Mens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3172	457	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	324	0.042	133
8	Womens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	3	72	0.22	3172	685	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	3	51	0.15	485	0.063	200
9	Hallway	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3172	457	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	324	0.042	133
11	Breakroom	F42EE	1 x 4 troffer	2	34w F40T12	9	72	0.65	3172	2,055	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	9	51	0.46	1,456	0.189	600
13	RA Office	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.58	3172	1,827	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.41	1,299	0.166	528
14	Asst. Office	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.58	3172	1,827	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.41	1,299	0.166	528

Contractor As-Built Savings
19A. Montebello Public Library

Contractor As-Built Savings																						
		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
15	Conference Room	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.58	3172	1,827	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.41	1,299	0.166	528
16	Work room	F44EE	2 x 4 troffer	4	34w F40T12	2	144	0.29	3172	914	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	102	0.20	650	0.083	264
17	Main Work Room	F44EE	2 x 4 troffer	4	34w F40T12	32	144	4.61	3172	14,617	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	32	102	3.28	10,394	1.331	4,223
18	Main Work Room	F42EE	1 x 4 troffer	2	34w F40T12	3	72	0.22	3172	685	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	3	51	0.15	485	0.063	200
22	Childrens Library	F44EE	2 x 4 troffer	4	34w F40T12	60	144	8.64	3172	27,406	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	60	102	6.14	19,489	2.496	7,917
23	Boys Restroom	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	3172	228	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	162	0.021	67
25	Girls Restroom	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	3172	228	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	162	0.021	67
27	Main Lobby	F44EE	Recessed round	4	34w F40T12	6	144	0.86	3172	2,741	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<.85)	6	102	0.61	1,949	0.250	792
28	Mens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3172	457	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	324	0.042	133
30	Womens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3172	457	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	324	0.042	133
32	Library Meeting Room	F46EE	Recessed round	6	34w F40T12	8	216	1.73	3172	5,481	y	Retrofit	F46ILL		6	Fluorescent, (6) 48", T-8 lamp, Instant Start Ballast, RLO (BF<.85)	8	156	1.24	3,946	0.484	1,535
34	AV Closet	F42EE	Wrap	2	34w F40T12	1	72	0.07	3172	228	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	162	0.021	67
35	Kitchen	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3172	457	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	324	0.042	133
36	Storage	F44EE	Wrap	4	34w F40T12	1	144	0.14	3172	457	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.10	325	0.042	132
38	Fax Room	F24EE	2 x 2 troffer	4	20wF20T12	3	112	0.34	3172	1,066	n	Retrofit	F24ILL		4	Fluorescent, (4) 24", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	3	55	0.17	525	0.170	541
39	Storage	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	3172	228	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	162	0.021	67

Contractor As-Built Savings
19A. Montebello Public Library

Contractor As-Built Savings																						
		Existing Fixtures										New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
41	Stairwell	F42EE	Wrap	2	34w F40T12	5	72	0.36	8760	3,154	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	5	51	0.26	2,234	0.105	920
42	Workroom	F44EE	8ft Tandem Industrial	4	34w F40T12	22	144	3.17	3172	10,049	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	22	102	2.25	7,146	0.915	2,903
43	Workroom	F42EE	4 ft Industrial	2	34w F40T12	14	72	1.01	3172	3,197	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	14	51	0.71	2,265	0.294	933
46	Garage	F42EE	8ft Strip	2	34w F40T12	32	72	2.30	4368	10,064	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	32	51	1.63	7,129	0.672	2,935
50	Storage	F81EE	Strip	1	60wF96T12	29	98	2.84	3172	9,015	n	Retrofit	F81ILL		2	8' Conversion Kit, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	29	51	1.48	4,691	1.363	4,323
52	Main Library	F43EE	2 x 4 troffer	3	34w F40T12	60	115	6.90	3172	21,887	n	Retrofit	F43ILL		3	Fluorescent, (3) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	60	78	4.67	14,826	2.226	7,061
53	Main Library	F44EE	2 x 4 troffer	4	34w F40T12	100	144	14.40	3172	45,677	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	100	102	10.24	32,481	4.160	13,196
54	Main Library	F42EE	1 x 4 troffer	2	34w F40T12	182	72	13.10	3172	41,566	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	182	51	9.28	29,443	3.822	12,123
58	Exterior	F42EE	1 x 8 Wrap	2	34w F40T12	36	72	2.59	4368	11,322	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	36	51	1.84	8,020	0.756	3,302
59	Exterior	F41EE	1 x 4 Wrap	1	34w F40T12	2	43	0.09	4368	376	n	Retrofit	F41ILL		1	Fluorescent, (1) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	27	0.05	236	0.032	140
60	Exterior	F41EE	1 x 4 Strip	1	34w F40T12	1	43	0.04	4368	188	n	Retrofit	F41ILL		1	Fluorescent, (1) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	27	0.03	118	0.016	70
61	Exterior	F42EE	1 x 4 Wrap	2	34w F40T12	1	72	0.07	4368	314	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	223	0.021	92
																Total T12-T8	662				21.325	70,019
2	Closet	I100/1	Keyless	1	100wA	1	100	0.10	3172	317	n	Replace	CFQ13/1		2	Drum Fixture Compact Fluorescent, (2) 13W Twin or Quad,	1	26	0.03	82	0.074	235
7	Mens Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235

Contractor As-Built Savings
19A. Montebello Public Library

Contractor As-Built Savings																						
19A. Montebello Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
10	Hallway	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235
19	Main Work Room	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Replace	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235
19.1	Main Work Room	CFQ13/1	Recessed round	1	CFL-13W SCREW-IN	3	13	0.04	3172	124	n	No Retro	CFQ13/1		1	No Retrofit	0	13	0.04	124	0.000	0
20	Closet	I100/1	Keyless	1	100wA	1	100	0.10	3172	317	n	Replace	CFQ13/2		2	Drum Fixture Compact Fluorescent, (2) 13W Twin or Quad,	1	26	0.03	82	0.074	235
21	Custodian	I75/1	Keyless	1	75w R30	1	75	0.08	3172	238	n	Retrofit	CFQ13/2		2	Drum Fixture Compact Fluorescent, (2) 13W Twin or Quad,	1	26	0.03	82	0.049	155
24	Boys Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235
26	Girls Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235
29	Mens Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235
31	Womens Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3172	317	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.074	235
33	Library Meeting Room	I150/1	Recessed round	1	150w R40	11	150	1.65	3172	5,234	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	11	26	0.29	907	1.364	4,327
37	Custodian	I150/1	Keyless	1	150w Par38	1	150	0.15	3172	476	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	82	0.124	393
47	Storage	I150/1	Pendant Mounted	1	150wR40	2	150	0.30	3172	952	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	165	0.248	787
48	Storage	I75/1	Pendant Mounted	1	RLM/75	2	75	0.15	3172	476	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	165	0.098	311
49	Telecom	I100/1	Pendant Mounted	1	100wA	2	100	0.20	3172	634	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	165	0.148	469
51	Mechanical Room	I150/1	Pendant Mounted	1	150wA	10	150	1.50	3172	4,758	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	10	26	0.26	825	1.240	3,933
55	Exterior	I150/1	Recessed round	1	150w A (?)	19	150	2.85	4368	12,449	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	19	26	0.49	2,158	2.356	10,291

Contractor As-Built Savings
19A. Montebello Public Library

		Existing Fixtures											New Fixtures								Savings	
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
56	Exterior	I150/1	Wall Pack	1	150w A	4	150	0.60	4368	2,621	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	4	26	0.10	454	0.496	2,167
57	Exterior	I150/2	Dual Flood Wall Mount	2	150w Par38	2	150	0.30	4368	1,310	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	227	0.248	1,083
																Total INCAN	63				7.037	26,029
TOTAL						740		79.58		265,033						TOTAL	737		51.06	168,482	28.52	96,551

Aloha Systems Measured Savings
19A. Montebello Public Library

Aloha Systems Measured Savings 19A. Montebello Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
45	Garage	HPS	HPS NO CHANGE				0	0.00	8760	0		No Retrofit	HPS		0	No Retrofit	0	0	0.00	0	0.000	0
45	Garage	HPS	HPS NO CHANGE				0	0.00	8760	0		No Retrofit	HPS		0	No Retrofit	0	0	0.00	0	0.000	0
																Total HID	0				0.000	0
44	Exit signs	EXIT	Varied			12	15	0.18	8760	1,577		Retrofit	EXIT		1	EXIT Light Emmitting Diode, 2W lamp, Dual Sided	12	2	0.02	210	0.156	1,367
																Total EXITS	12				0.156	1,367
1	CLM office	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.576	3403	1960	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.4096	1393.8688	0.1664	566.2592
3	Outer Office	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3403	490	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	347	0.042	143
4	Staff Work Room	F44EE	2 x 4 troffer	4	34w F40T12	18	144	2.59	3403	8,821	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	18	102	1.84	6,272	0.749	2,548
5	Closet	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	520	37	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	27	0.021	11
6	Mens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3403	490	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	347	0.042	143
8	Womens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	3	72	0.22	3403	735	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	3	51	0.15	521	0.063	214
9	Hallway	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3411	491	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	348	0.042	143
11	Breakroom	F42EE	1 x 4 troffer	2	34w F40T12	9	72	0.65	3403	2,205	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	9	51	0.46	1,562	0.189	643
13	RA Office	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.58	3403	1,960	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.41	1,394	0.166	566
14	Asst. Office	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.58	3403	1,960	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.41	1,394	0.166	566

Aloha Systems Measured Savings
19A. Montebello Public Library

Aloha Systems Measured Savings 19A. Montebello Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen. & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
15	Conference Room	F44EE	2 x 4 troffer	4	34w F40T12	4	144	0.58	3403	1,960	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	4	102	0.41	1,394	0.166	566
16	Work room	F44EE	2 x 4 troffer	4	34w F40T12	2	144	0.29	3403	980	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	102	0.20	697	0.083	283
17	Main Work Room	F44EE	2 x 4 troffer	4	34w F40T12	32	144	4.61	3403	15,681	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	32	102	3.28	11,151	1.331	4,530
18	Main Work Room	F42EE	1 x 4 troffer	2	34w F40T12	3	72	0.22	3403	735	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	3	51	0.15	521	0.063	214
22	Childrens Library	F44EE	2 x 4 troffer	4	34w F40T12	60	144	8.64	3403	29,402	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	60	102	6.14	20,908	2.496	8,494
23	Boys Restroom	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	3403	245	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	174	0.021	71
25	Girls Restroom	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	3403	245	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	174	0.021	71
27	Main Lobby	F44EE	Recessed round	4	34w F40T12	6	144	0.86	3403	2,940	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<.85)	6	102	0.61	2,091	0.250	849
28	Mens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3403	490	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	347	0.042	143
30	Womens Restroom	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3403	490	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	347	0.042	143
32	Library Meeting Room	F46EE	Recessed round	6	34w F40T12	8	216	1.73	3403	5,880	y	Retrofit	F46ILL		6	Fluorescent, (6) 48", T-8 lamp, Instant Start Ballast, RLO (BF<.85)	8	156	1.24	4,233	0.484	1,647
34	AV Closet	F42EE	Wrap	2	34w F40T12	1	72	0.07	520	37	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	27	0.021	11
35	Kitchen	F42EE	1 x 4 troffer	2	34w F40T12	2	72	0.14	3403	490	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	51	0.10	347	0.042	143
36	Storage	F44EE	Wrap	4	34w F40T12	1	144	0.14	520	75	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	102	0.10	53	0.042	22
38	Fax Room	F24EE	2 x 2 troffer	4	20wF20T12	3	112	0.34	3403	1,143	n	Retrofit	F24ILL		4	Fluorescent, (4) 24", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	3	55	0.17	564	0.170	580
39	Storage	F42EE	1 x 4 troffer	2	34w F40T12	1	72	0.07	520	37	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	27	0.021	11

Aloha Systems Measured Savings
19A. Montebello Public Library

Aloha Systems Measured Savings 19A. Montebello Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
41	Stairwell	F42EE	Wrap	2	34w F40T12	5	72	0.36	8760	3,154	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	5	51	0.26	2,234	0.105	920
42	Workroom	F44EE	8ft Tandem Industrial	4	34w F40T12	22	144	3.17	3403	10,781	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	22	102	2.25	7,666	0.915	3,114
43	Workroom	F42EE	4 ft Industrial	2	34w F40T12	14	72	1.01	3403	3,430	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	14	51	0.71	2,430	0.294	1,000
46	Garage	F42EE	8ft Strip	2	34w F40T12	32	72	2.30	8676	19,990	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	32	51	1.63	14,159	0.672	5,830
50	Storage	F81SE	Strip	1	60wF96T12	29	90	2.61	520	1,357	n	Retrofit	F81ILL		2	8' Conversion Kit, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	29	51	1.48	769	1.131	588
52	Main Library	F43EE	2 x 4 troffer	3	34w F40T12	60	115	6.90	3403	23,481	n	Retrofit	F43ILL		3	Fluorescent, (3) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	60	78	4.67	15,906	2.226	7,575
53	Main Library	F44EE	2 x 4 troffer	4	34w F40T12	100	144	14.40	3403	49,003	n	Retrofit	F44ILL		4	Fluorescent, (4) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	100	102	10.24	34,847	4.160	14,156
54	Main Library	F42EE	1 x 4 troffer	2	34w F40T12	182	72	13.10	3403	44,593	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	182	51	9.28	31,587	3.822	13,006
58	Exterior	F42EE	1 x 8 Wrap	2	34w F40T12	36	72	2.59	4327	11,216	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	36	51	1.84	7,944	0.756	3,271
59	Exterior	F41EE	1 x 4 Wrap	1	34w F40T12	2	43	0.09	4327	372	n	Retrofit	F41ILL		1	Fluorescent, (1) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	2	27	0.05	234	0.032	138
60	Exterior	F41EE	1 x 4 Strip	1	34w F40T12	1	43	0.04	4327	186	n	Retrofit	F41ILL		1	Fluorescent, (1) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	27	0.03	117	0.016	69
61	Exterior	F42EE	1 x 4 Wrap	2	34w F40T12	1	72	0.07	4327	312	n	Retrofit	F42ILL		2	Fluorescent, (2) 48", T-8 lamp, Instant Start Ballast, RLO (BF<0.85)	1	51	0.05	221	0.021	91
																Total T12-T8	662				21.093	73,084
2	Closet	I100/1	Keyless	1	100wA	1	100	0.10	520	52	n	Replace	CFQ13/1		2	Drum Fixture Compact Fluorescent, (2) 13W Twin or Quad,	1	26	0.03	14	0.074	38
7	Mens Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252

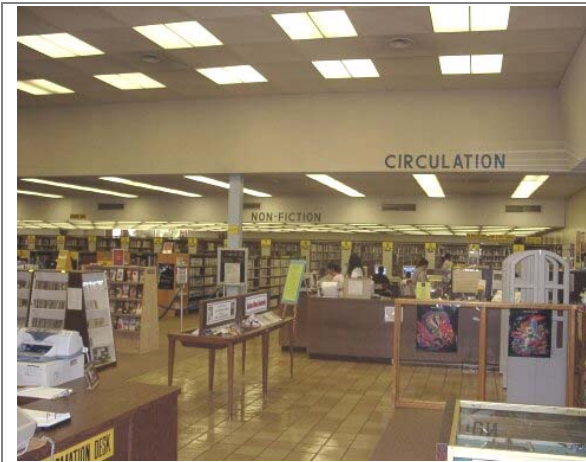
Aloha Systems Measured Savings
19A. Montebello Public Library

Aloha Systems Measured Savings 19A. Montebello Public Library																						
Existing Fixtures												New Fixtures								Savings		
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
10	Hallway	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252
19	Main Work Room	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Replace	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252
19.1	Main Work Room	CFQ13/1	Recessed round	1	CFL-13W SCREW-IN	0	13	0.00	3403	0	n	No Retro	CFQ13/1		1	No Retrofit	0	13	0.00	0	0.000	0
20	Closet	I100/1	Keyless	1	100wA	1	100	0.10	520	52	n	Replace	CFQ13/2		2	Drum Fixture Compact Fluorescent, (2) 13W Twin or Quad,	1	26	0.03	14	0.074	38
21	Custodian	I75/1	Keyless	1	75w R30	1	75	0.08	520	39	n	Retrofit	CFQ13/2		2	Drum Fixture Compact Fluorescent, (2) 13W Twin or Quad,	1	26	0.03	14	0.049	25
24	Boys Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252
26	Girls Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252
29	Mens Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252
31	Womens Restroom	I100/1	Recessed round	1	100wA	1	100	0.10	3403	340	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	88	0.074	252
33	Library Meeting Room	I150/1	Recessed round	1	150w R40	11	150	1.65	3403	5,615	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	11	26	0.29	973	1.364	4,642
37	Custodian	I150/1	Keyless	1	150w Par38	1	150	0.15	520	78	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	1	26	0.03	14	0.124	64
47	Storage	I150/1	Pendant Mounted	1	150wR40	2	150	0.30	520	156	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	27	0.248	129
48	Storage	I75/1	Pendant Mounted	1	RLM/75	2	75	0.15	520	78	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	27	0.098	51
49	Telecom	I100/1	Pendant Mounted	1	100wA	2	100	0.20	520	104	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	27	0.148	77
51	Mechanical Room	I150/1	Pendant Mounted	1	150wA	10	150	1.50	520	780	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	10	26	0.26	135	1.240	645
55	Exterior	I150/1	Recessed round	1	150w A (?)	19	150	2.85	3920	11,172	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	19	26	0.49	1,936	2.356	9,236

Aloha Systems Measured Savings
19A. Montebello Public Library

		Existing Fixtures											New Fixtures								Savings			
Item	Area Floor	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls: motion sen.; & A/B	Retrofit of Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	#of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
56	Exterior	I150/1	Wall Pack	1	150w A	4	150	0.60	3920	2,352	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	4	26	0.10	408	0.496	1,944		
57	Exterior	I150/2	Dual Flood Wall Mount	2	150w Par38	2	150	0.30	3920	1,176	n	Retrofit	CFQ26/1		1	Compact Fluorescent, (1) 26W screw-in lamp, Twin or Quad, Globe or Capsule	2	26	0.05	204	0.248	972		
62																Total INCAN	63				7.037	19,625		
TOTAL						737		79.31		273,468			TOTAL						737		51.02	179,392	28.29	94,076

Montebello Public Library – 1550 W. Beverly Blvd.



Main Library Light Fixtures



Main Library Light Fixtures



Main Library Light Fixtures



Children's Library Light Fixtures



Downstairs Book Storage Light Fixtures



Garage Level Storage Room Light Fixtures

Montebello Public Library – 1550 W. Beverly Blvd.



Parking Garage Lighting



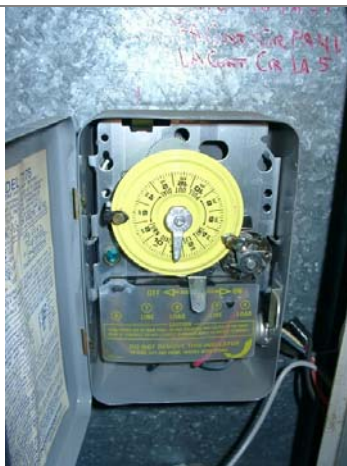
Equipment Room Lights and Power Panels



Equipment Room Incandescent Fixture



Parking Garage Panels



Timer for Outdoor Compact Fluorescents



Garage Power Room Panel LA

Montebello Public Library – 1550 W. Beverly Blvd.



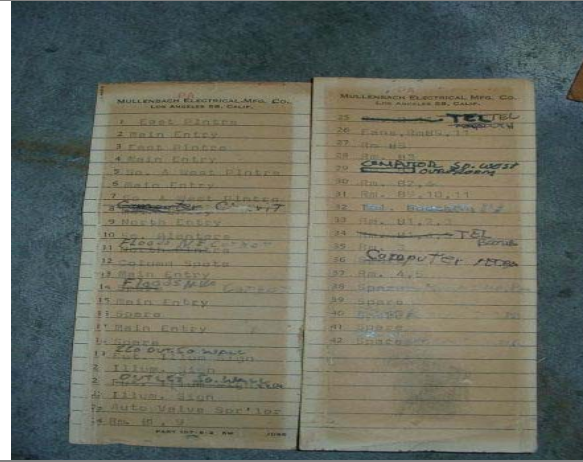
Garage Power Room Panel LE



Garage Power Room Timer for T8 Lights



Garage Power Room Panel PA Section 2 With Datalogger



Garage Power Room Panel PA Legend



Garage Power Room Panel PA Split Bus



Garage Power Room Contact Timer (middle) With Datalogger

Montebello Public Library – 1550 W. Beverly Blvd.



Contact Timer With Datalogger (Top)



Contactor With Datalogger (Bottom)

Site Measurement and Verification Report

Site Number 20

DPSS South Family

1326 W. Imperial Highway, Rancho Dominguez

SCE Account 3-011-6128-11

Annual Energy Savings Estimates	
Building Area	133,000 ft ²
LA County Estimate at 1.31 kWh/ft ²	174,409 kWh
<i>Ex-Ante</i> Evaluation	174,409 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	19,604 kWh
Potential <i>Ex-Post</i> Savings	30,163 kWh

Site Description

The Department of Public Social Services is a single main building with offices and large bullpen areas. It is 133,000 square feet. Southern California Edison supplies the facility at 480Y/277 volts through meter V349R-000025.

The lighting control setup on all of the panels is set to turn on lights at 6:00 a.m. and turn off the lights at 7:00 p.m. There is an override button available to staff that allows the system to be overridden to be on for an additional two hours before turning the lights off.

Controls Locations

A total of six new control units were installed on the lighting panels as part of the energy efficiency program. All of the old panels were replaced with new Square D panels. The Square D panels are model NF2000G3 and can control each individual breaker in the entire lighting panel.

Preliminary Site Visit

During the visit power measurements were taken and dataloggers were installed in panels LA, LB, LC, LD, and LF. LE was the only lighting panel part of the controls project that was not monitored by a datalogger. Dataloggers were installed to provide a “pre-controls” load profile. This load profile documents the operation of each panel before the installation of the new panels and control systems. Then it can be concluded whether the lighting controls reduced or increased operating time.

Post-Retrofit Audit

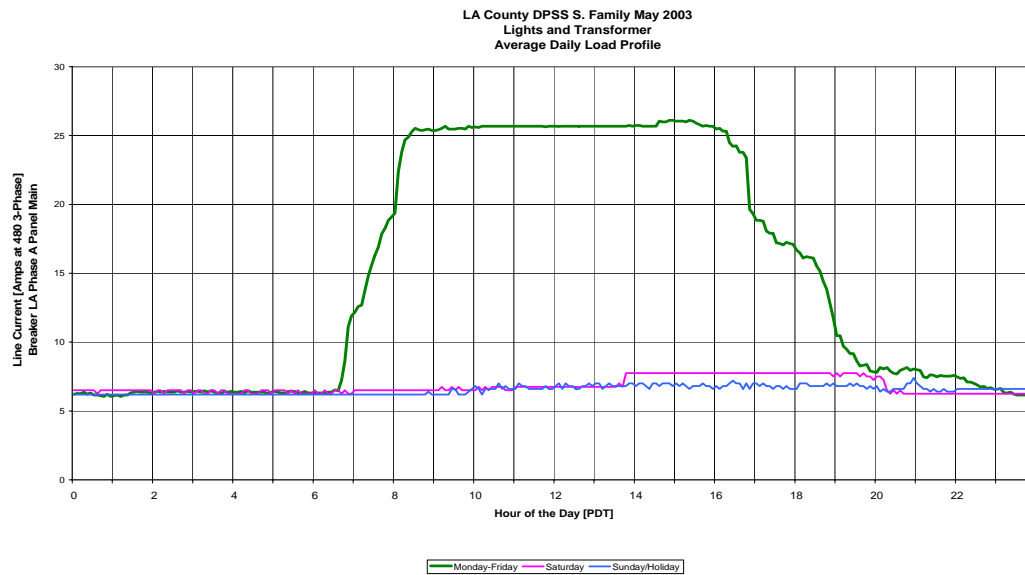
The site was again visited on March 17, 2004. We again took power measurements at the main breakers. For each of the panels the breakers are located in the main service area outside of the building. We installed dataloggers for the same five lighting panels.

Metered Load Profiles

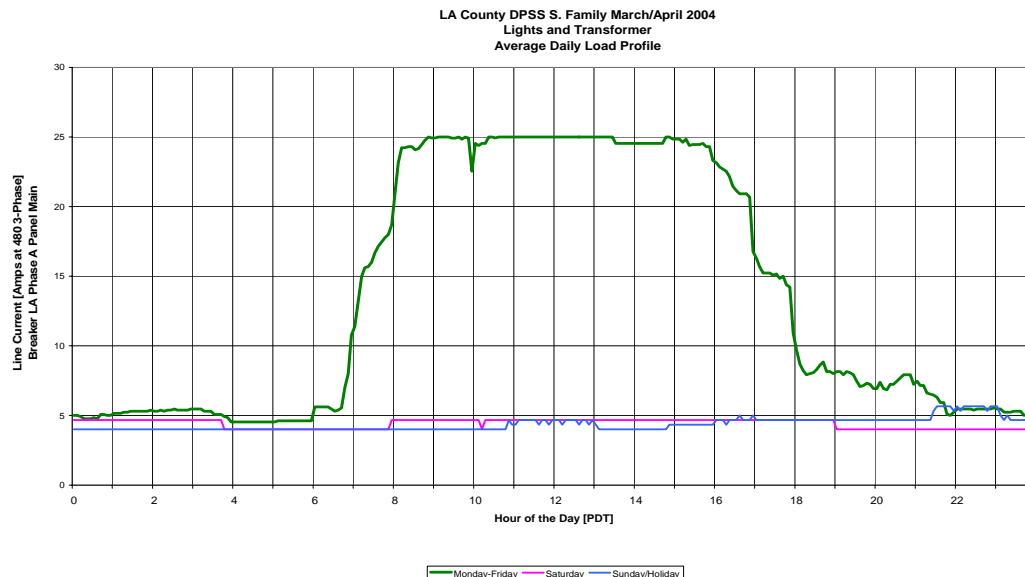
This facility is an office building with typical office hours; most areas are not in use throughout the night and weekends. We collected interval data for lighting loads in five lighting panels. To the extent possible we metered the same phase of the same panel with the same datalogger, thus assuring the comparative aspect of the pre- and post-installation data. Panels LC and LF were the only panels where we used different dataloggers. We used different dataloggers of the same brand and size for these two panels because the original dataloggers were not available. Panel LE is the only panel that did not have a datalogger installed, so no load profile is available for that panel. With the exception of panel LC, the rest of the panels had loads that were not being controlled such as a water heater, transformer, or plug loads. To get an accurate lighting power load from these panels we calculated the power draw of the loads that are not being controlled and subtracted the number from the power drawn from the whole panel. This gives an adjusted power draw that only represents lights that are being controlled.

Panel LA: This lighting panel controls lights in the offices, parking lot, waiting room, bathrooms, and exit lights. The lighting panel also controls a water heater and a transformer. The recorded power draw of the panel was 19.34 kW. The power draw of the lights after adjusting for non-controlled loads is 16.20 kW. The continuously operating load shown in the load profiles is primarily the transformer magnetizing current. The full-load operating time before installation was 3,084 hours per year. The post-installation equivalent operating time was 2,603 h/yr, indicating the system decreased operating time by 481 hours per year. The controls are currently operating less than the 3,250 h/yr proposed equivalent operating time so changing this operating time to the proposed 3,250 h/yr would decrease energy savings.

Pre-Installation

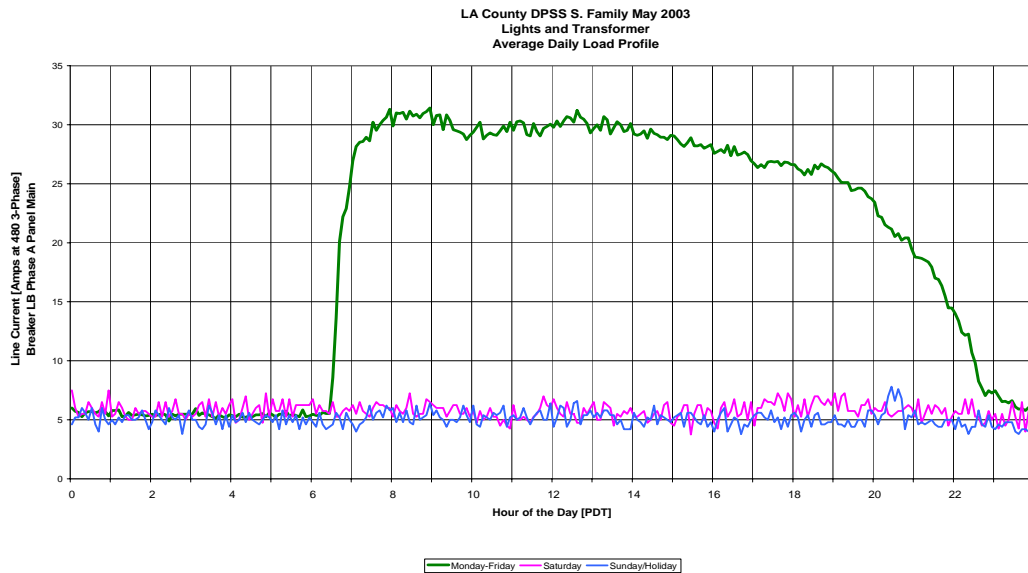


Post-Installation

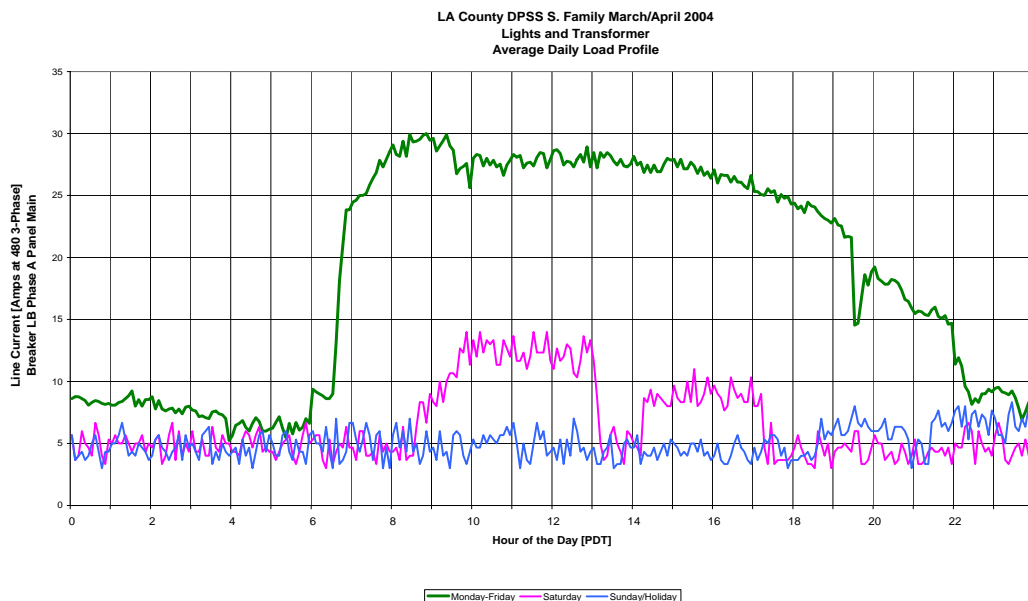


Panel LB: This lighting panel controls lights in offices as well as a transformer supplying 120/208-volt power. The recorded power draw of the panel was 22.91 kW. The power draw of the lights after adjusting for non-controlled loads is 20.53 kW. The continuously operating load shown in the load profiles is primarily the transformer magnetizing current. Before installation the lights operated between 6:30 a.m. to 11:00 p.m. with a peak load during the week from 7:00 a.m. to 7:00 p.m. This results in 3,564 hours per year. The post-installation equivalent operating time was 3,438 h/yr, indicating the system decreased operating time by 126 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 314 hours to 3250 hours per year.

Pre-Installation

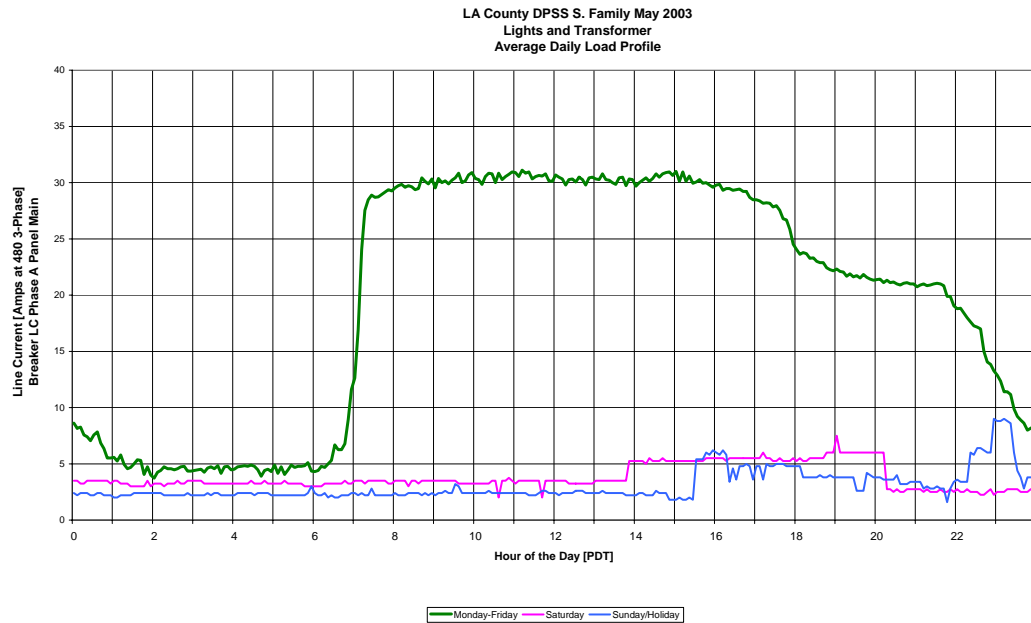


Post Installation

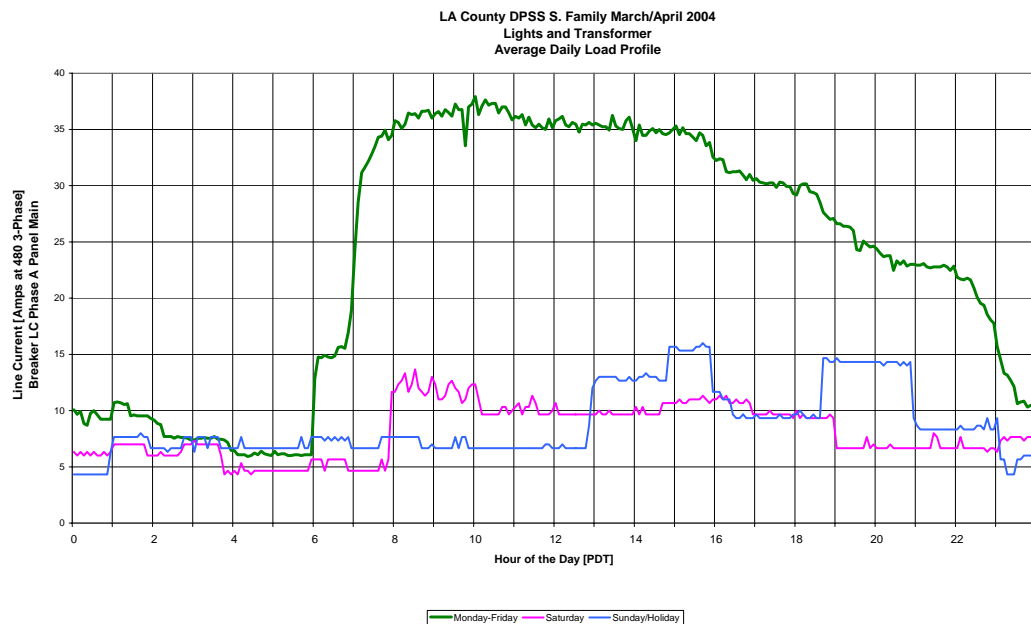


Panel LC: This lighting panel controls lights in offices and various types of rooms as well as two water heaters and a transformer. The recorded power draw of the lights on this panel was 26.27 kW. The equivalent full-load operating time before installation was 3,630 hours per year. The continuously operating load shown in the load profiles is primarily the transformer magnetizing current. The post-installation equivalent operating time was 3,574 h/yr, indicating the system decreased operating time by 56 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 380 hours to 3250 hours per year.

Pre-Installation

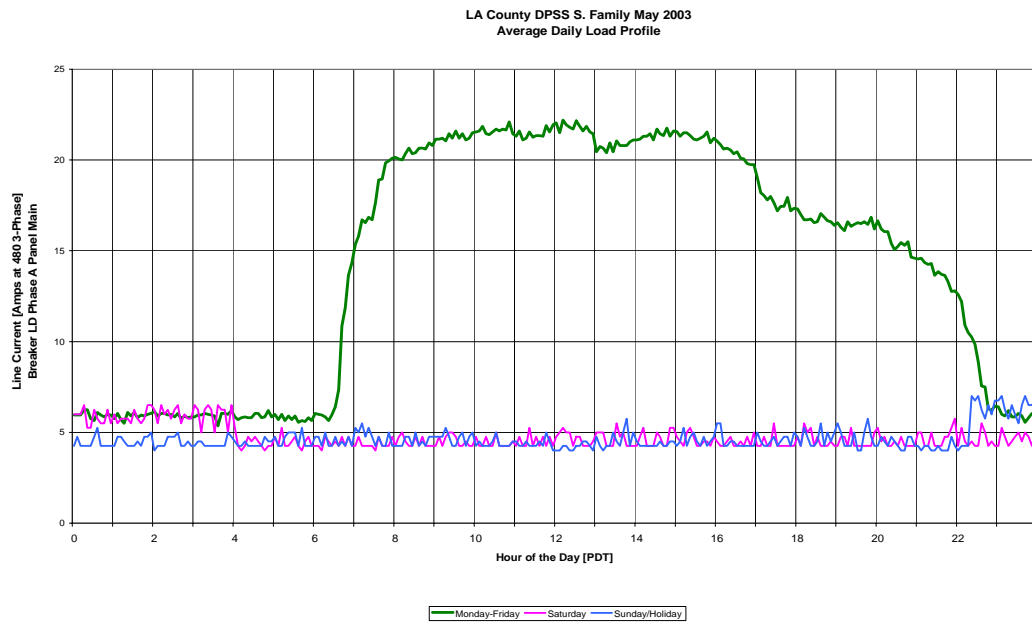


Post-Installation

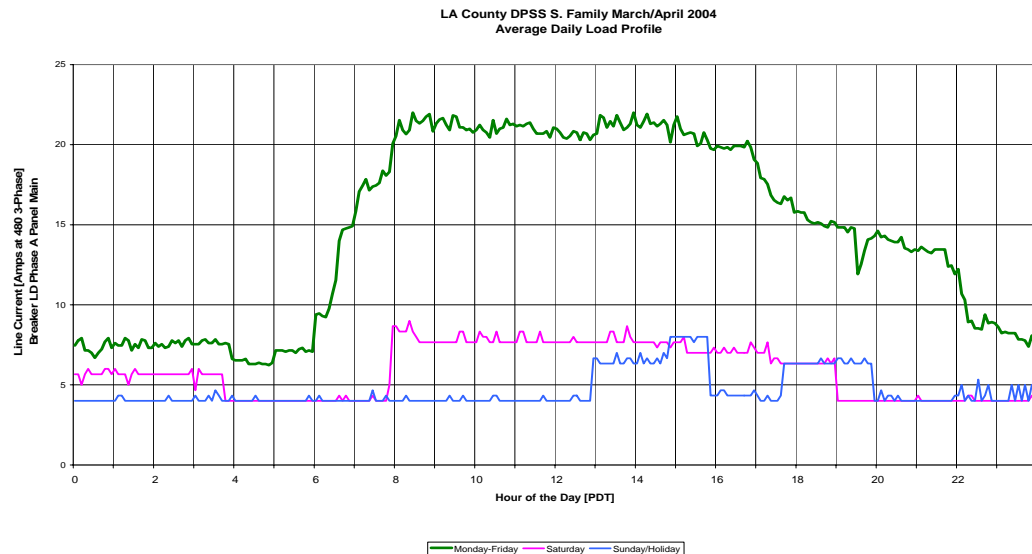


Panel LD: This lighting panel controls lights in offices and various other areas. The recorded power draw of the panel was 27.08 kW. The power draw of the lights after adjusting for non-controlled loads is 13.35 kW. The continuously operating load shown in the load profiles is primarily the transformer magnetizing current, which was recorded slightly differently by two different dataloggers. The equivalent full-load operating time before installation was 3,239 hours per year. The post-installation equivalent operating time was 3,221 h/yr, indicating the system decreased operating time by 18 hours per year. The controls are currently operating less than the 3,250 h/yr proposed equivalent operating time so changing this operating time to the proposed 3,250 h/yr would decrease energy savings.

Pre-Installation



Post-Installation



Panel LE: This lighting panel controls office lights and various other areas. Power measurements were taken from the actual panel. The recorded power draw of the lights on this panel was 27.72 kW. A datalogger was not installed on this panel. We used the average value of Panels LA, LB, LC, and LD to estimate a 170 hour/year reduction at this panel.

Panel LF: This lighting panel controls lights in offices and various other areas. As with other panels, it also feeds a 120/208-volt transformer. However, unlike the other panels, the transformer on LF was heavily loaded. We were originally told that the panels were strictly lighting, and the pre-installation data recorded in the main panel contained the transformer load as well. This made meaningful analysis of lighting operation virtually impossible. As with Panel LE, we applied the average 170 h/yr reduction. The recorded power draw of the panel was 25.92 kW. The power draw of the lights after adjusting for non-controlled loads is 16.48 kW.

Energy Savings Calculations

The following table delineates the savings at this site for each of the lighting panels included in the project. The annual savings is the full-load demand (kW) multiplied by the change in equivalent full-load operating hours as determined by comparing the pre- and post-control load profiles for the same locations. Negative numbers indicate increased operation after the controls were installed and result in increased energy consumption on these panels. Panel LE is without “pre-control hours” and “post-control hours” for which we assume similar operation to monitored panels.

DPSS South Family Lighting Control Systems Annual kWh Savings (Measured)					
Panel Name	Measured kW	Pre-Control Hours	Post-Control Hours	Operating Hour Reduction	kWh Saved
Panel LA	16.20	3,084	2,603	481	7,792
Panel LB	20.53	3,564	3,438	126	2,587
Panel LC	26.27	3,630	3,574	56	1,471
Panel LD	13.35	3,239	3,221	18	240
Panel LE	27.72	3,379	3,209	170	4,712
Panel LF	16.48	3,379	3,209	170	2,802
Total/Avg	120.55	3,379	3,209	170	19,604

The control systems were installed late in the program and had not been implemented to their full or planned capability at the time of our post-installation data collection. The systems allow programming at the individual circuit level, and the control operation of the circuit breakers can be overridden at the panel by pushing a button on the breaker. Weekend use of the lighting also appears to be sporadic. The post-install monitoring period included one Saturday with lighting use while the pre-install monitoring period did not have weekend use. This difference contributes to some of the increased post-install operating times that was not caused by the system.

Energy Management Division plans for the DPSS South Family building call for 3,250 hour per year operation throughout the facility. The following table presents the energy savings that each panel would achieve if its lights were operated 3,250 hours per year or at their present operating hours for those that currently operate less than 3,250 h/yr.

DPSS South Family Lighting Control Systems Annual kWh Savings (Proposed)					
Panel Name	Measured kW	Pre-Control Hours	Proposed Control Hours	Operating Hour Reduction	kWh Saved
Panel LA	16.20	3,084	2,603	481	7,792
Panel LB	20.53	3,564	3,250	314	6,446
Panel LC	26.27	3,630	3,250	380	9,983
Panel LD	13.35	3,239	3,221	18	240
Panel LE	27.72	3,379	3,250	129	3,576
Panel LF	16.48	3,379	3,250	129	2,126
Total/Avg	120.55	3,379	3,250		30,163

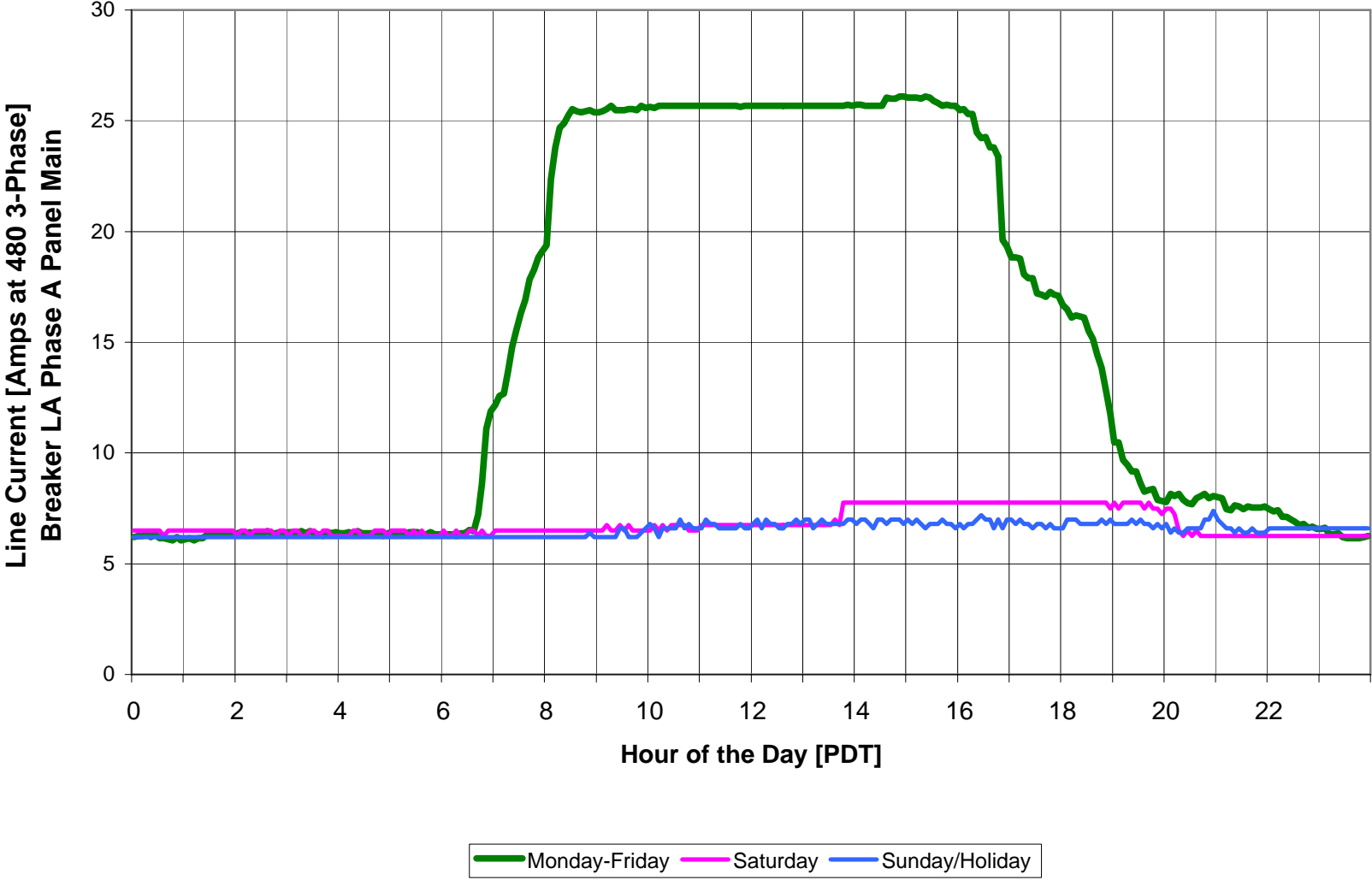
The proposal measure unit for building controls was square feet of building area, with a total savings estimate of 1.31134 kWh/yr-ft². The DPSS South Family building is 133,000 ft². We verified that lighting controls were installed to effectively control the lights throughout the entire building. Thus the *ex-ante* savings estimate is 174,409 kWh per year, which is the same as the county’s estimated savings for this site.

The total *ex-post* evaluation of savings for these control systems is 19,604 kWh per year as operating at the time of our metering. However, we are aware that the system had been installed late in the program period and that it was not fully commissioned during our metering period (which had to be completed in order to prepare this report in a timely manner). This particular number also has the negative affect of sporadic Saturday building use occurring during the post-install, but not pre-install, monitoring period.

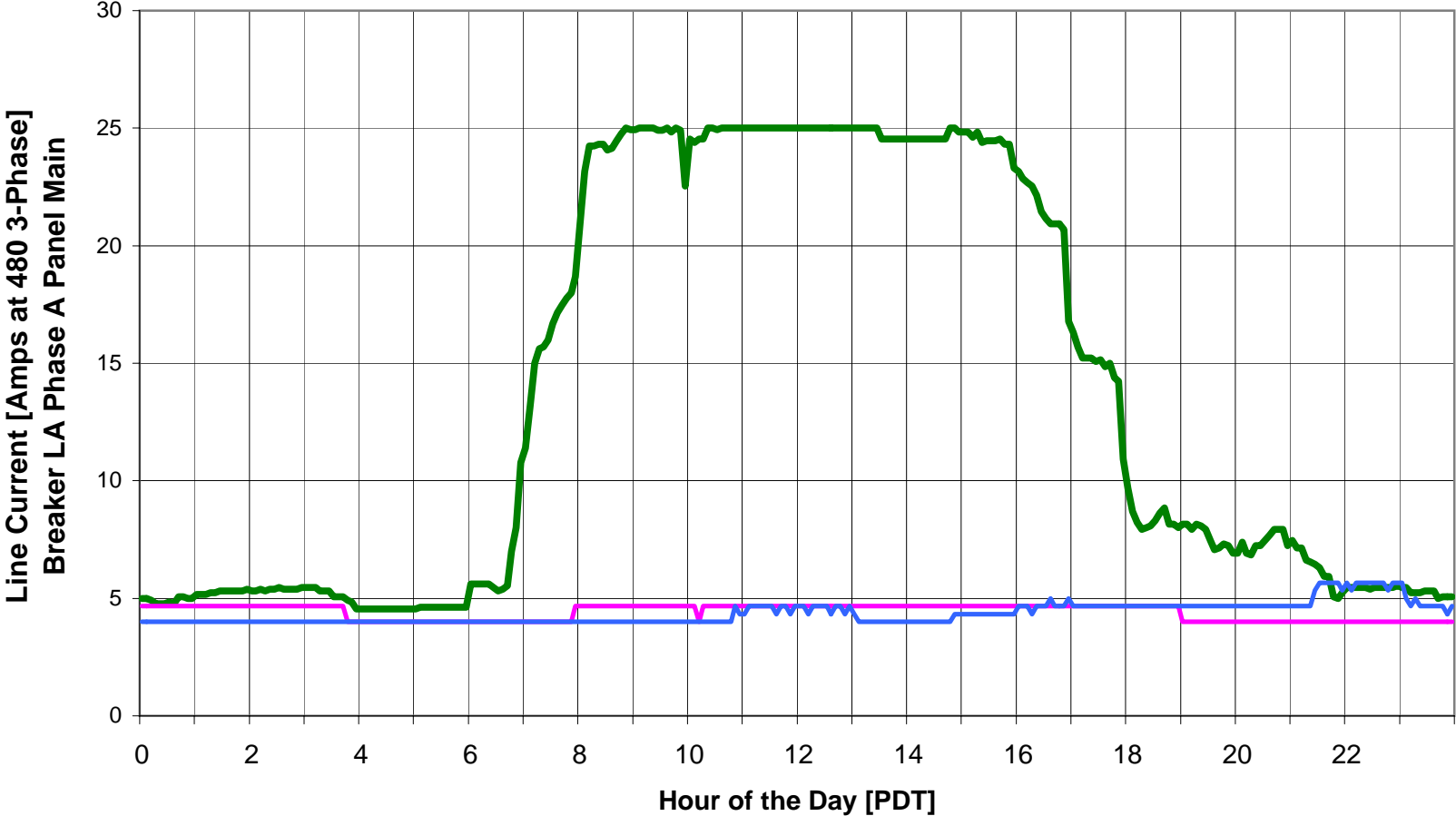
If the control system is optimized as described above, the total savings will be 30,163 kWh/year, which is a “potential *ex-post*” energy savings. We anticipate that the actual operating savings achieved will be between the present number (19,604) and the potential (30,163), and that the originally proposed value (174,409) is not possible.

We also emphasize that the failure of this control system to achieve the desired savings is *not* because the new system does not work, but rather because the system existing prior to the retrofit worked adequately.

LA County DPSS S. Family May 2003
Lights and Transformer
Average Daily Load Profile

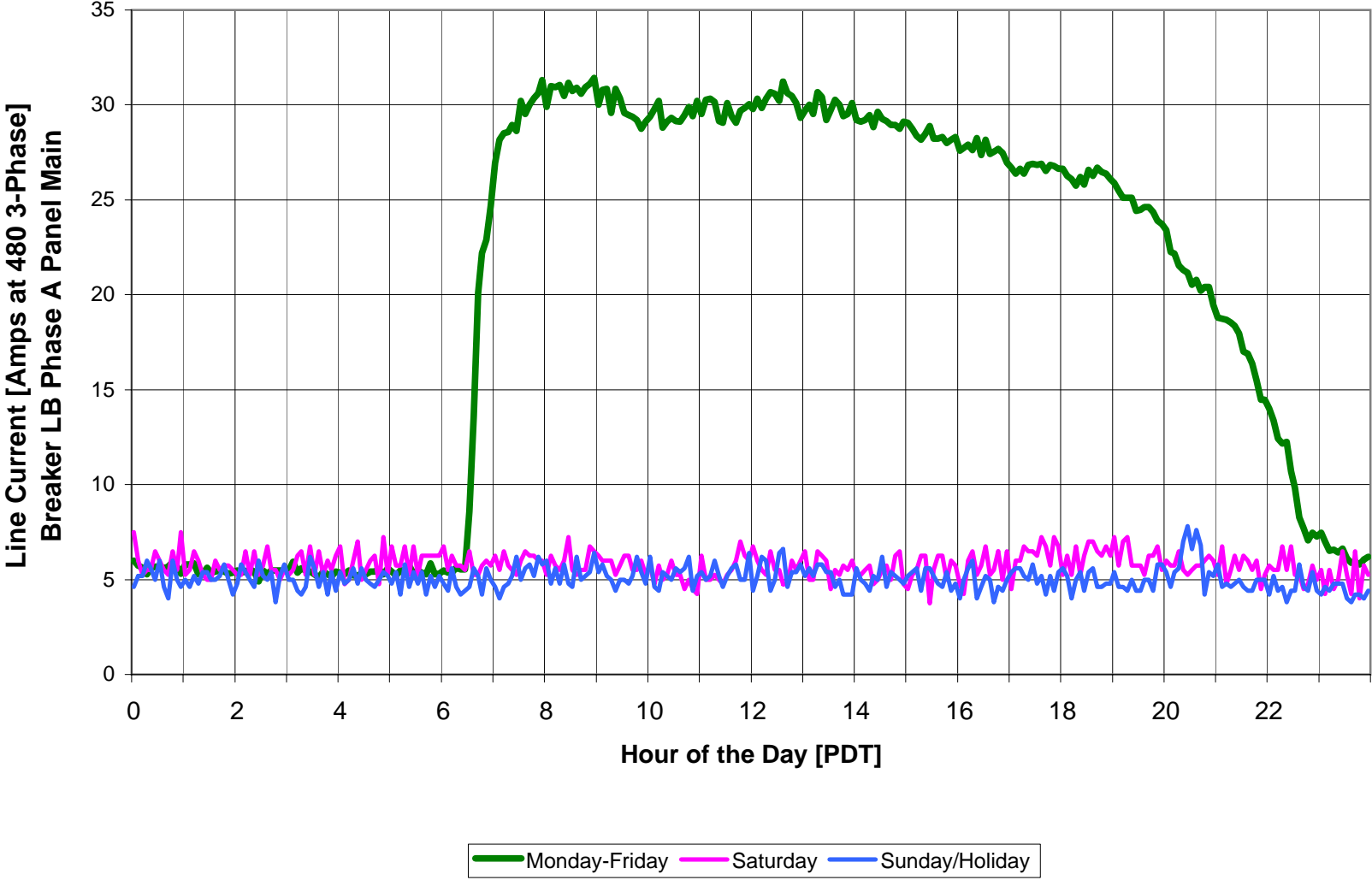


LA County DPSS S. Family March/April 2004
Lights and Transformer
Average Daily Load Profile

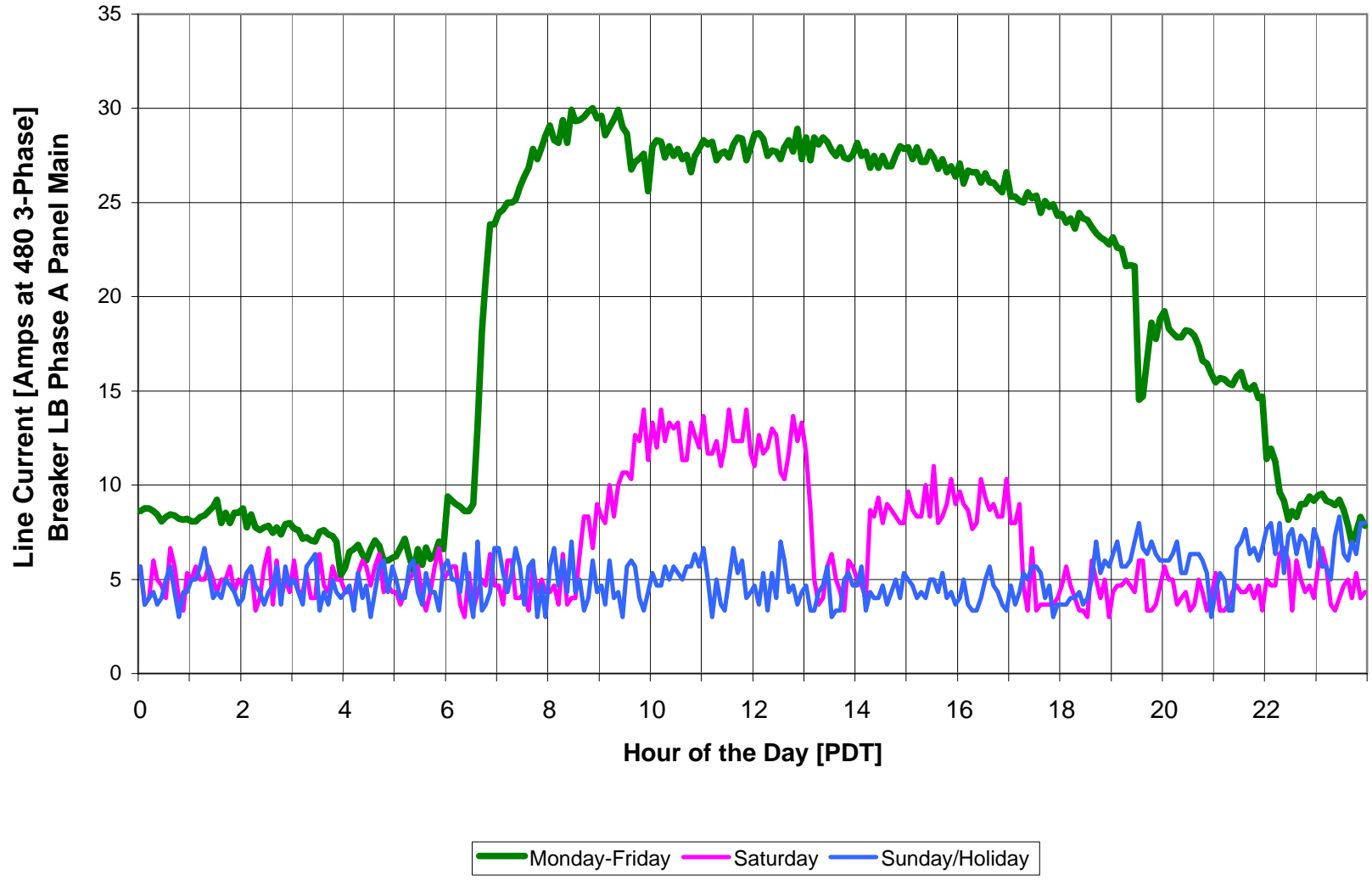


Monday-Friday Saturday Sunday/Holiday

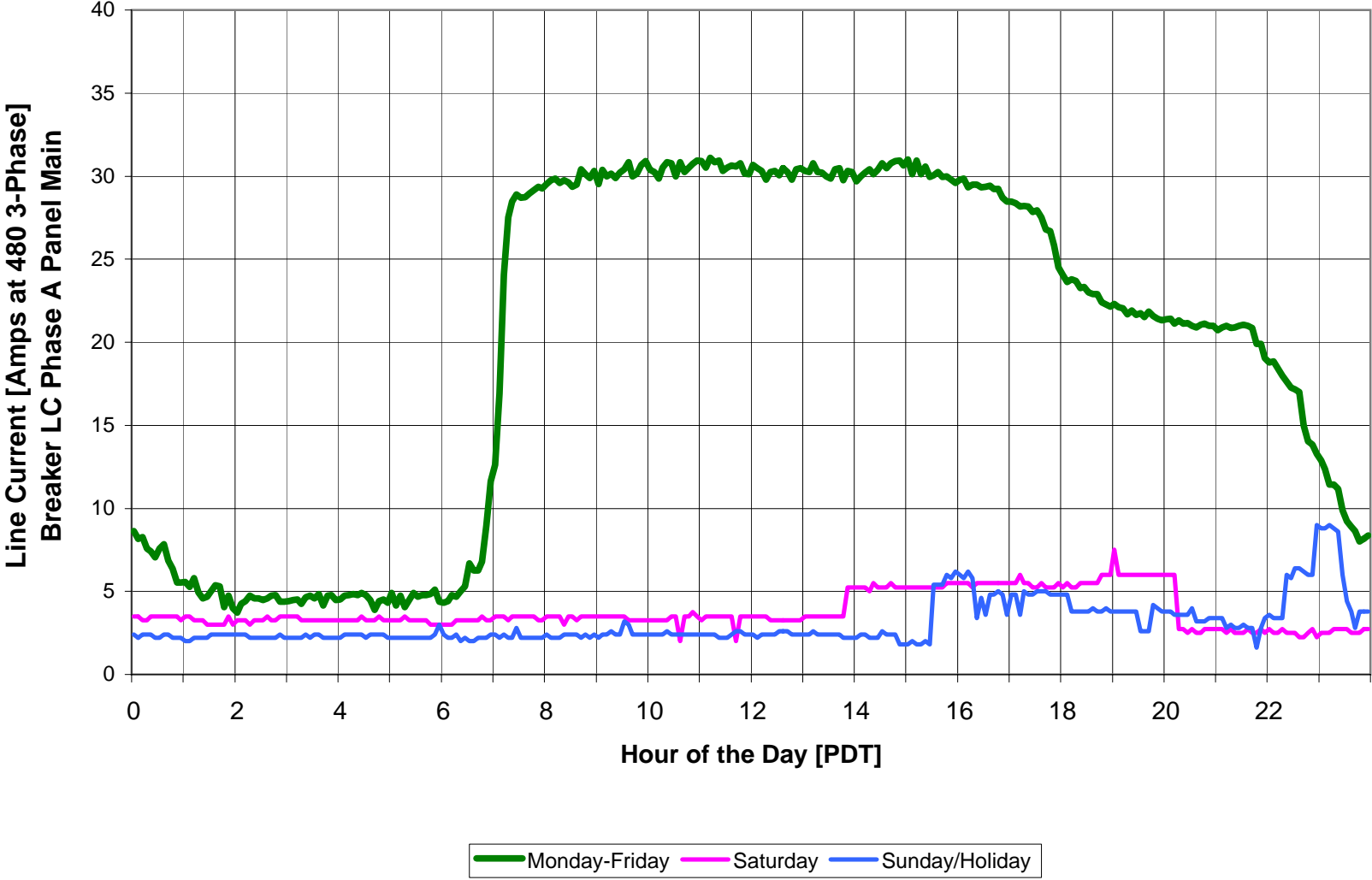
LA County DPSS S. Family May 2003
Lights and Transformer
Average Daily Load Profile



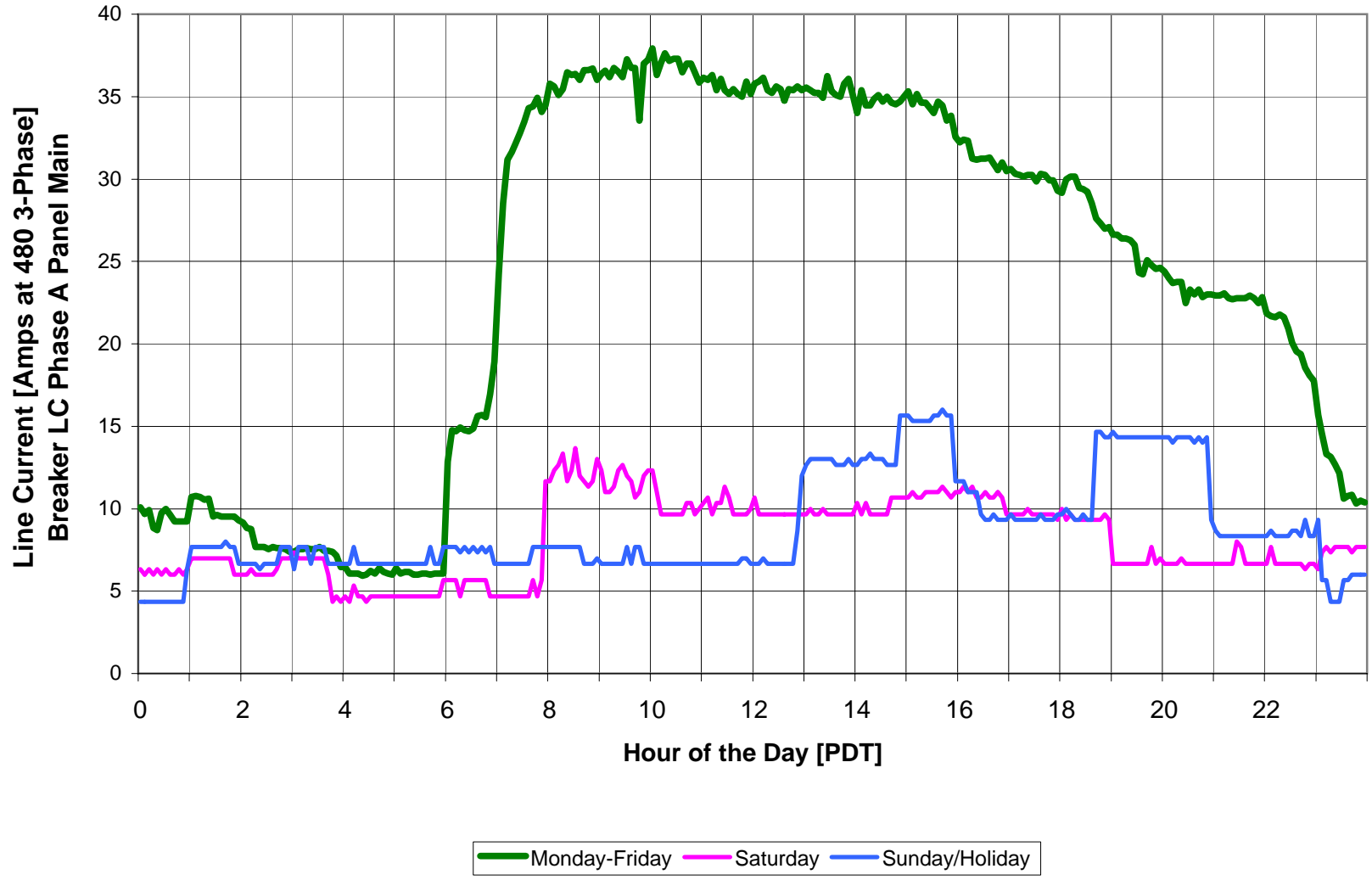
LA County DPSS S. Family March/April 2004
Lights and Transformer
Average Daily Load Profile



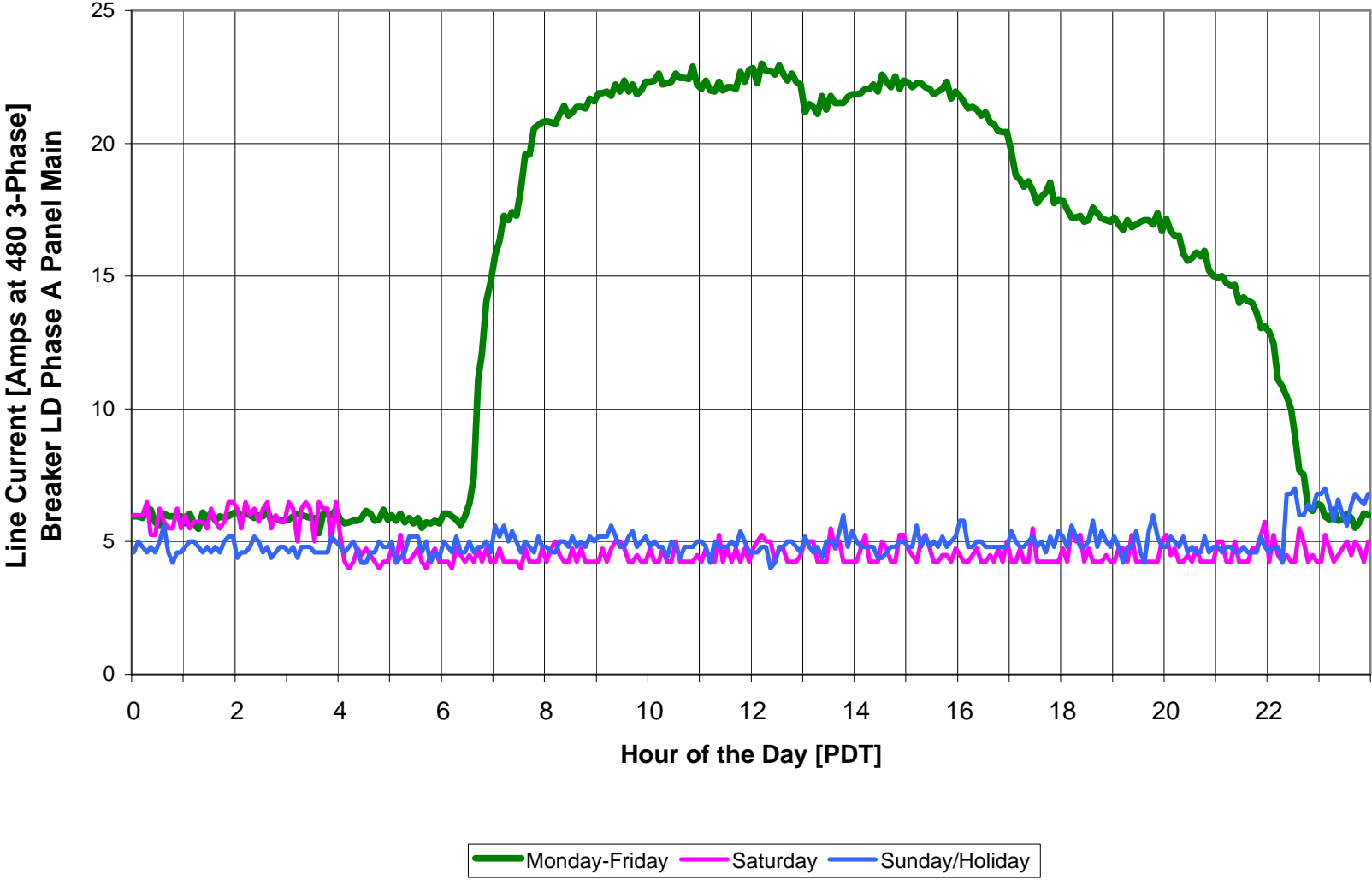
LA County DPSS S. Family May 2003
Lights and Transformer
Average Daily Load Profile



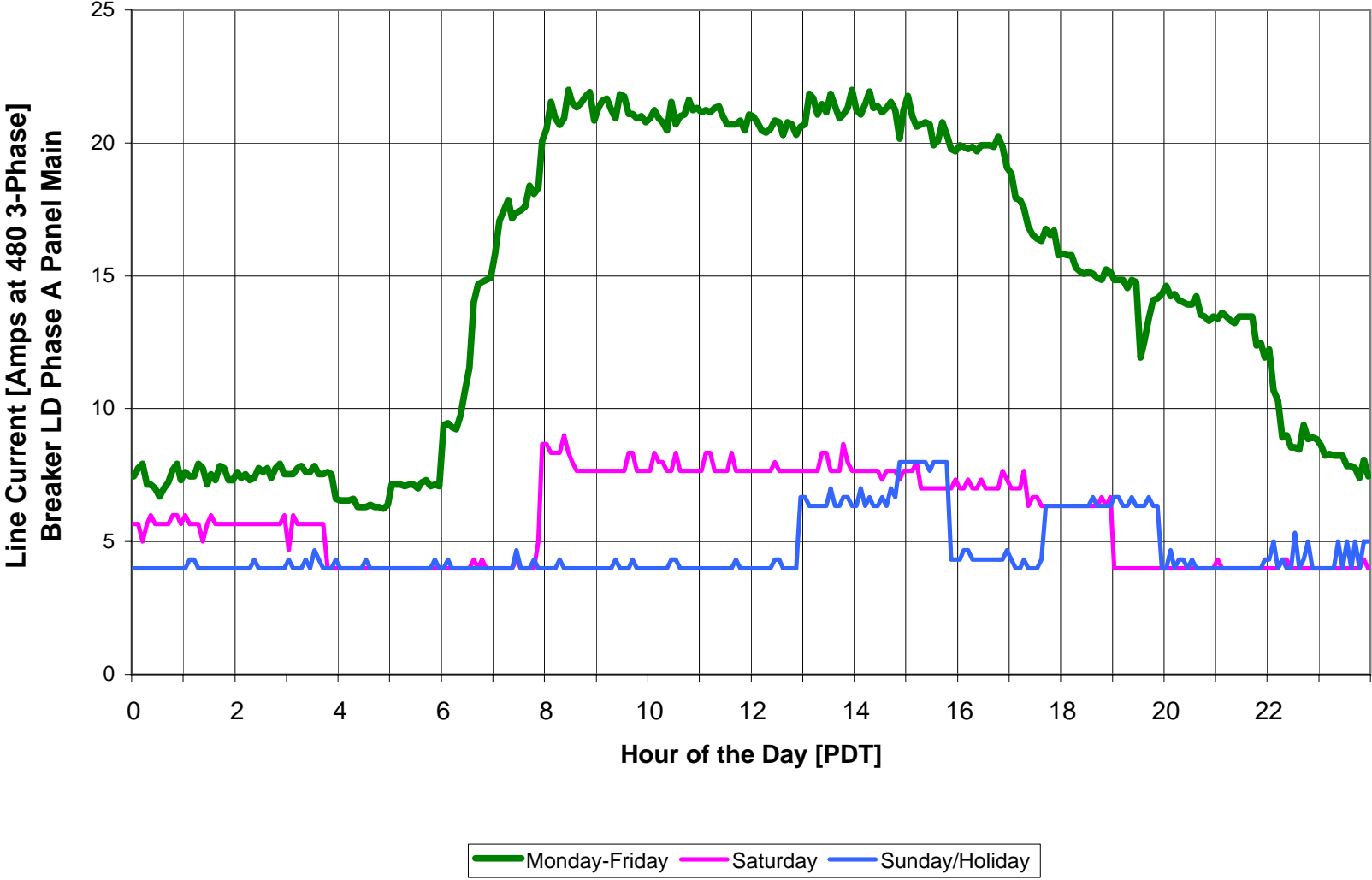
LA County DPSS S. Family March/April 2004
Lights and Transformer
Average Daily Load Profile



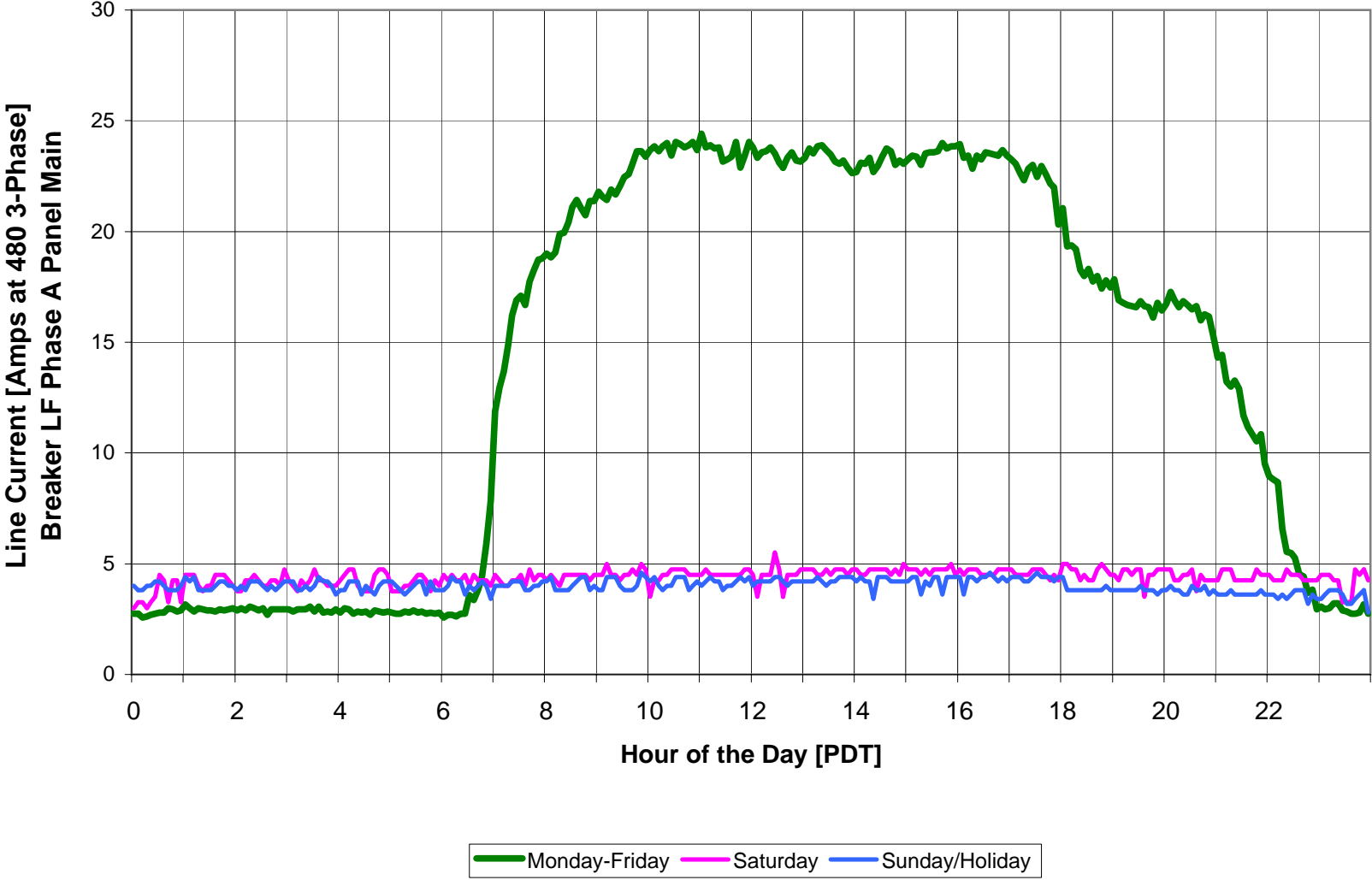
LA County DPSS S. Family May 2003
Average Daily Load Profile



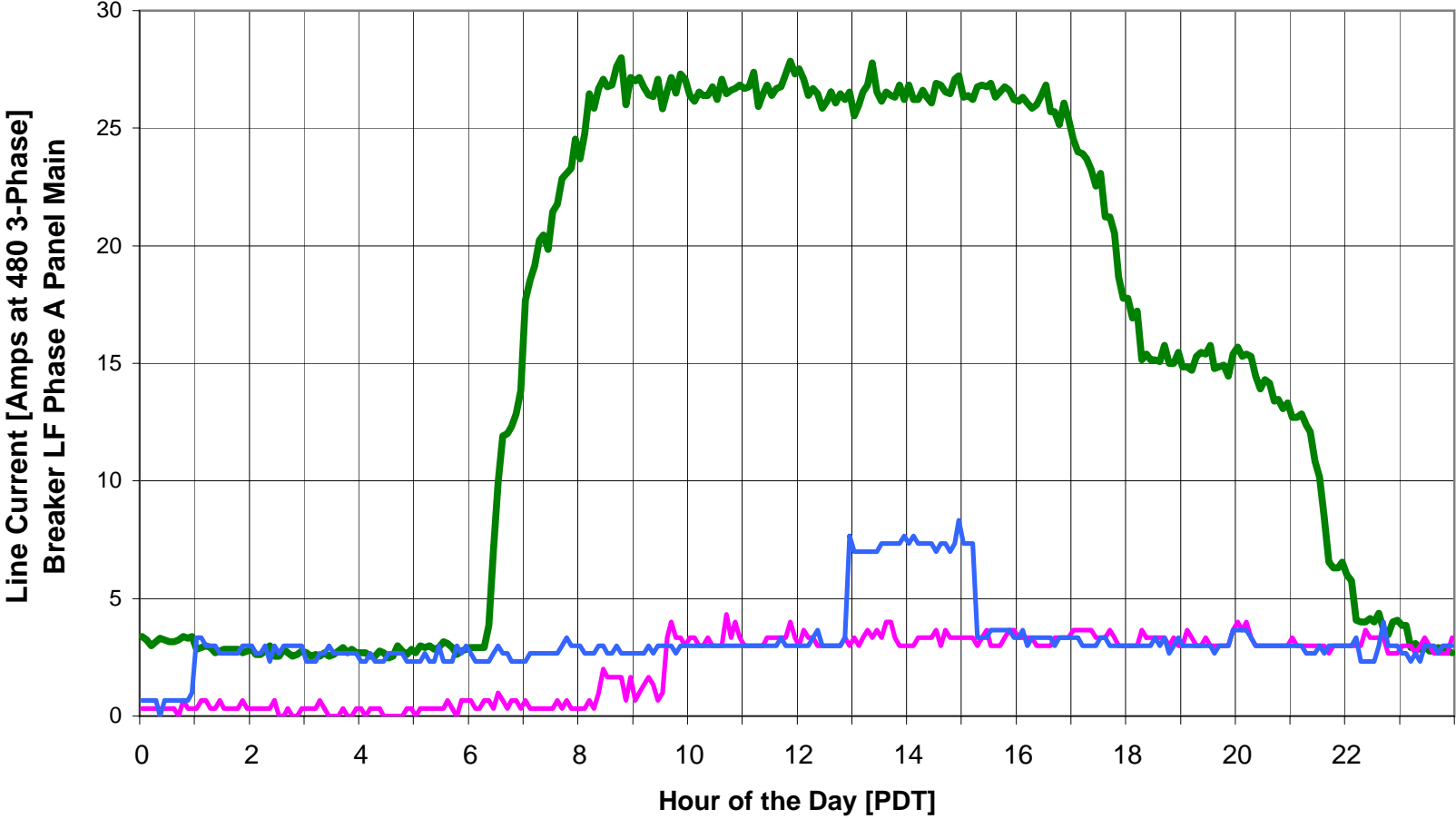
LA County DPSS S. Family March/April 2004
Average Daily Load Profile



LA County DPSS S. Family May 2003
Lights
Average Daily Load Profile



LA County DPSS S. Family March/April 2004
Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday



LA County CPUC Local Program #156-02

Site 20 - DPSS South Family

Main Breaker Feed to Panel LA					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	26.33	7.18	7.32	1.44	0.98
B	20.97	5.77	5.84	0.89	0.99
C	23.21	6.39	6.45	0.84	0.99
TOT/AVG	23.50	19.34	19.61	3.17	0.99

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
13, 15 - Water Heater	5.56	5.79	0.00		
Current Total	5.56	5.79	0.00		
Real Power [kW] Total	1.54	1.60	0.00		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel LA Adjusted Power Readings		
Phase	Current	Real P [kW]
A	20.77	5.64
B	15.18	4.17
C	23.21	6.39
TOT/AVG	19.72	16.20



LA County CPUC Local Program #156-02

Site 20 - DPSS South Family

Main Breaker Feed to Panel LB					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	28.55	7.29	7.42	1.40	0.98
B	28.37	7.71	7.90	1.70	0.98
C	28.78	7.91	7.97	1.06	0.99
TOT/AVG	28.57	22.91	23.29	4.16	0.98

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
2 - DDD Office	2.99				
4 - Suspense		3.79			
15 - Office		1.83			
Current Total	2.99	5.62	0.00		
Real Power [kW] Total	0.83	1.56	0.00		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel LB Adjusted Power Readings		
Phase	Current	Real P [kW]
A	25.56	6.46
B	22.75	6.15
C	28.78	7.91
TOT/AVG	25.70	20.53



LA County CPUC Local Program #156-02

Site 20 - DPSS South Family

Main Breaker Feed to Panel LC					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	36.40	9.99	10.40	1.61	0.99
B	35.78	9.60	9.76	1.81	0.98
C	23.60	6.68	6.77	1.06	0.99
TOT/AVG	31.93	26.27	26.93	4.48	0.99

No adjustments needed for Panel LC



LA County CPUC Local Program #156-02

Site 20 - DPSS South Family

Main Breaker Feed to Panel LD					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	22.89	6.28	6.35	0.92	0.99
B	38.33	10.20	10.80	1.16	0.99
C	38.25	10.60	11.10	2.78	0.96
TOT/AVG	33.16	27.08	28.25	4.86	0.98

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Circuits 20, 22, 24	8.12	21.71	19.75		
3 Phase Transformer					
Serving Panel PD					
Plug Loads					
Current Total	8.12	21.71	19.75		
Real Power [kW] Total	2.25	6.01	5.47		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel LD Adjusted Power Readings		
Phase	Current	Real P [kW]
A	14.77	4.03
B	16.62	4.19
C	18.50	5.13
TOT/AVG	16.63	13.35



LA County CPUC Local Program #156-02

Site 20 - DPSS South Family

Main Breaker Feed to Panel LE					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	29.90	7.95	7.99		0.99
B	34.70	10.30	10.50		0.99
C	34.30	9.47	9.56		0.99
TOT/AVG	32.97	27.72	28.05		0.99

No adjustments needed for Panel LE



LA County CPUC Local Program #156-02

Site 20 - DPSS South Family

Main Breaker Feed to Panel LF					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	37.71	10.30	10.40	1.98	0.98
B	36.07	9.84	10.00	1.80	0.99
C	21.88	5.78	6.35	1.84	0.96
TOT/AVG	31.89	25.92	26.75	5.62	0.98

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Circuits 13, 15, 17	11.60	12.41	10.08		
3 Phase Transformer					
Serving Panel PF					
Plug Loads					
Current Total	11.60	12.41	10.08		
Real Power [kW] Total	3.21	3.44	2.79		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel LF Adjusted Power Readings		
Phase	Current	Real P [kW]
A	26.11	7.09
B	23.66	6.40
C	11.80	2.99
TOT/AVG	20.52	16.48

DPSS South Family – 17600 South Santa Fe



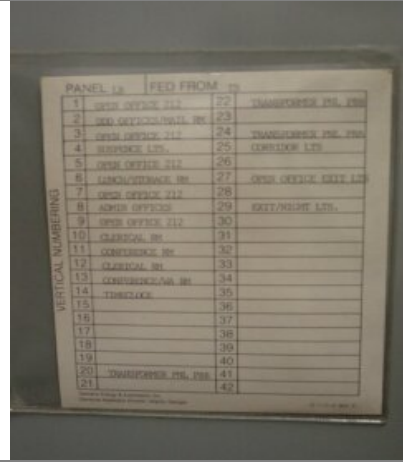
Panel LA and Timer



Panel LA Directory



Panel LB and Timer



Panel LB Directory



Panel LC



Panel LC Directory

DPSS South Family – 17600 South Santa Fe



Panel LD and Timer

A photograph of a printed directory sheet for the electrical panels. The sheet is titled "PANEL NO." and "FEED FROM NO." and contains a list of panel numbers and their corresponding feed sources.

PANEL NO.	FEED FROM NO.	FEED FROM
1	22	TRANSFORMER PNL. 22
2	"	"
3	"	"
4	"	"
5	"	"
6	27	WATER PNL.
7	28	"
8	29	"
9	30	"
10	31	"
11	32	"
12	33	"
13	34	"
14	35	"
15	36	"
16	37	"
17	38	"
18	39	"
19	40	"
20	41	"
21	42	"

Panel LD Directory



Timer

Site Measurement and Verification Report

Site Number 21

Southwest DPSS

9150 E. Imperial Highway, Los Angeles

SCE Account 3-012-1919-60

Annual Energy Savings Estimates from Lighting Controls	
Building Area	153,896 ft ²
LA County Estimate at 1.31 kWh/ft ²	201,811 kWh
<i>Ex-Ante</i> Evaluation	201,811 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	290,535 kWh
Potential <i>Ex-Post</i> Savings	527,827 kWh

Site Description

The Department of Public Social Services is a single main building with small and large offices. It comprises 153,896 square feet of floor space. Southern California Edison supplies the facility at 480Y/277 volts through meter V349E-002223.

The lighting control setup on all the panels is set to turn on lights at 5:30 a.m. and turn off the lights at 7:00 p.m. A few offices that are not occupied are turned off.

Controls Locations

A total of six new control units were installed on the lighting panels as part of the energy efficiency program. All of the old panels were replaced with new Square D panels. The Square D panels are model NF2000G3 and can control each individual breaker in the entire lighting panel.

Preliminary Site Visit

During the visit power measurements were taken and dataloggers were installed in panels B, C, and D. Panels A, M, and Y are part of the controls project but were not monitored by a datalogger. Dataloggers were installed to provide a “pre-controls” load profile. This load profile documents the operation of each panel before the installation of the new panels and control systems. Then it can be concluded whether the lighting controls reduced or increased operating time.

Post-Retrofit Audit

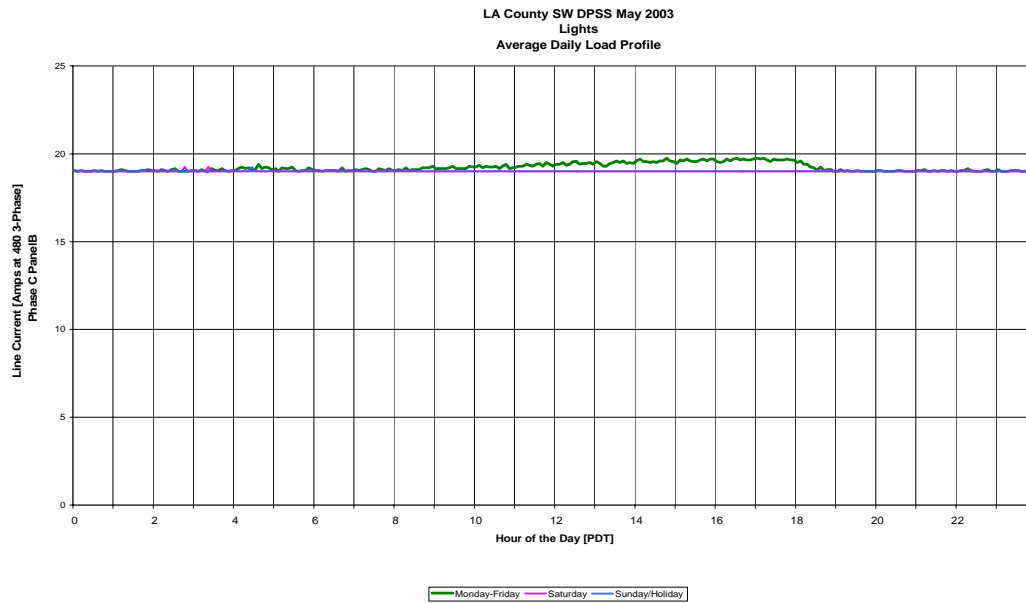
The site was again visited on March 17, 2004. We again took power measurements at the feeder breakers to the lighting panels. For each of the panels the breakers are located in the main service area at the back of the building. We installed dataloggers for the same three lighting panels.

Metered Load Profiles

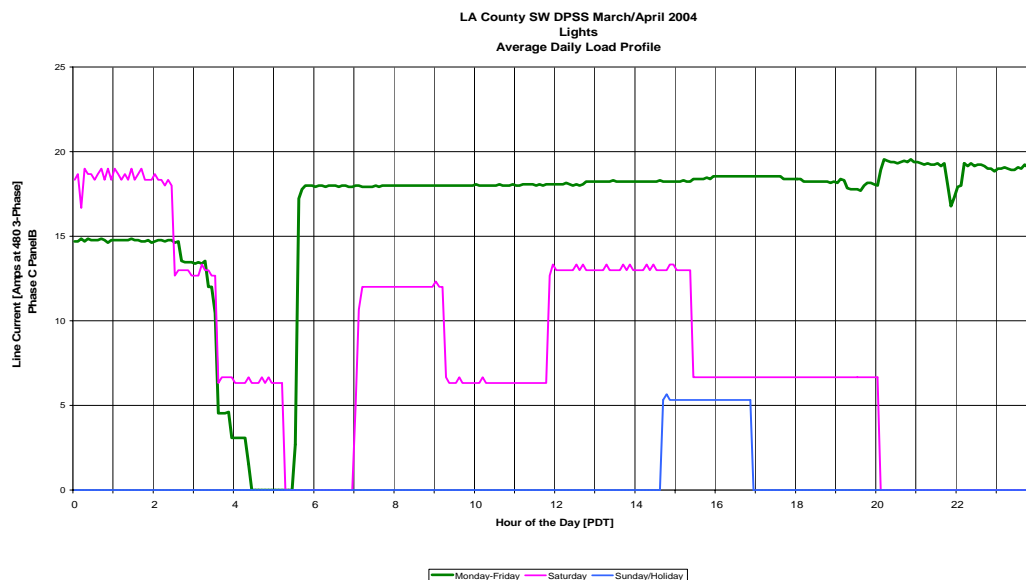
The facility is occupied and operated like a regular office building. We collected interval data for lighting loads in three lighting panels. We metered the same phase of the same panel with the same datalogger for panel C, thus assuring the comparative aspect of the pre- and post-installation data. Different dataloggers of the same brand and size were used on panels B and D because the original dataloggers were not available. Lighting panels A, M, and Y did not have a datalogger installed, so no load profile is available for these panels. With the exception of panels A and B, the rest of the panels have loads that are not being controlled such as a water heater or a transformer. To get an accurate power draw from these panels we calculated the power draw of the loads that are not being controlled and subtracted the number from the power drawn from the whole panel. This gives an adjusted power draw that only represents lights that are being controlled.

Panel B: This lighting panel controls lights in the open office areas. This panel is located near room 100E and next to panels A and Y. Power measurements were taken from the main area breakers. The power draw of the lights is 18.29 kW. Prior to installation of the control system, the lights operated continuously, 8,760 hours per year. The post-installation equivalent operating time was 5,594 h/yr. This indicates that the control system actually decreased operating time of the lights by 3,148 hours. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 5,367 hours to 3,375 hours per year.

Pre-Installation

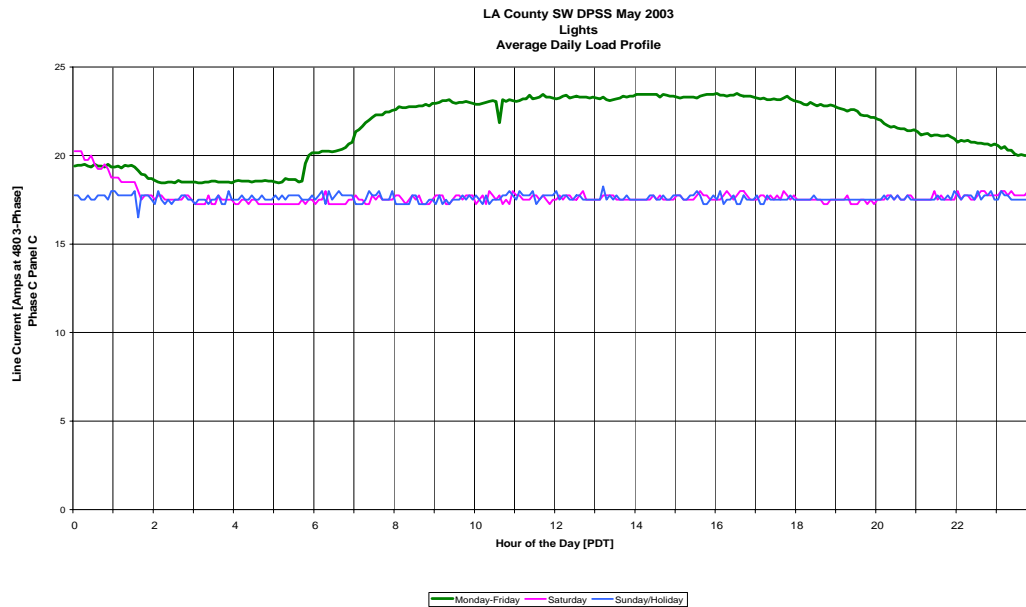


Post-Installation

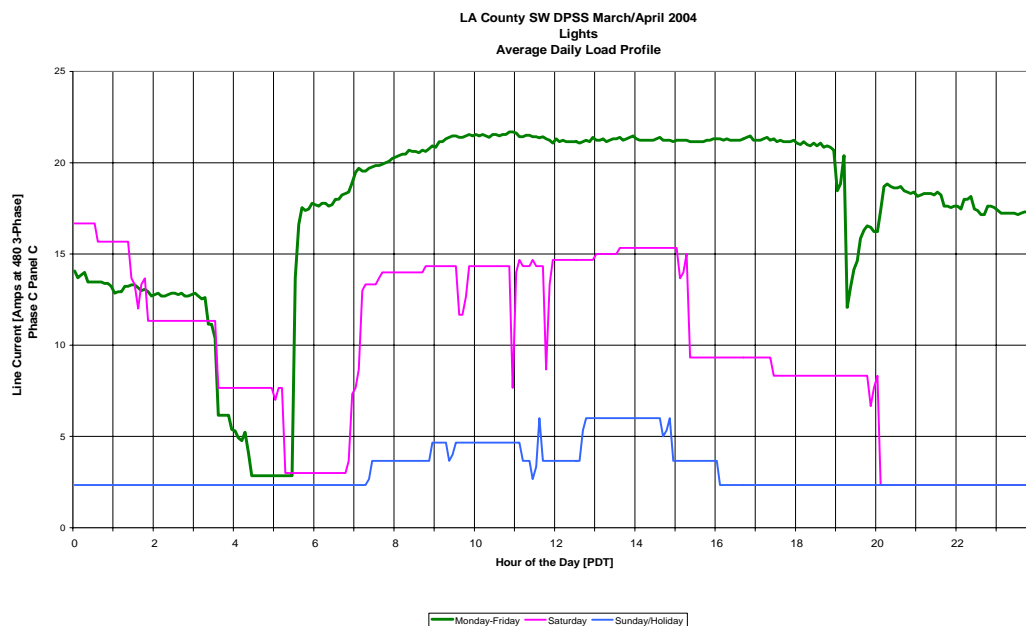


Panel C: This lighting panel controls office, sales, and HID lights. Power measurements were taken from the actual panel. The recorded power draw of the lights is 20.26 kW. The equivalent full-load operating time before installation was 7,619 hours per year. The post-installation equivalent operating time was 5,211 h/yr. This indicates that the control system actually decreased operating time of the lights by 2,408 hours. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 4,244 hours to 3,375 hours per year.

Pre-Installation

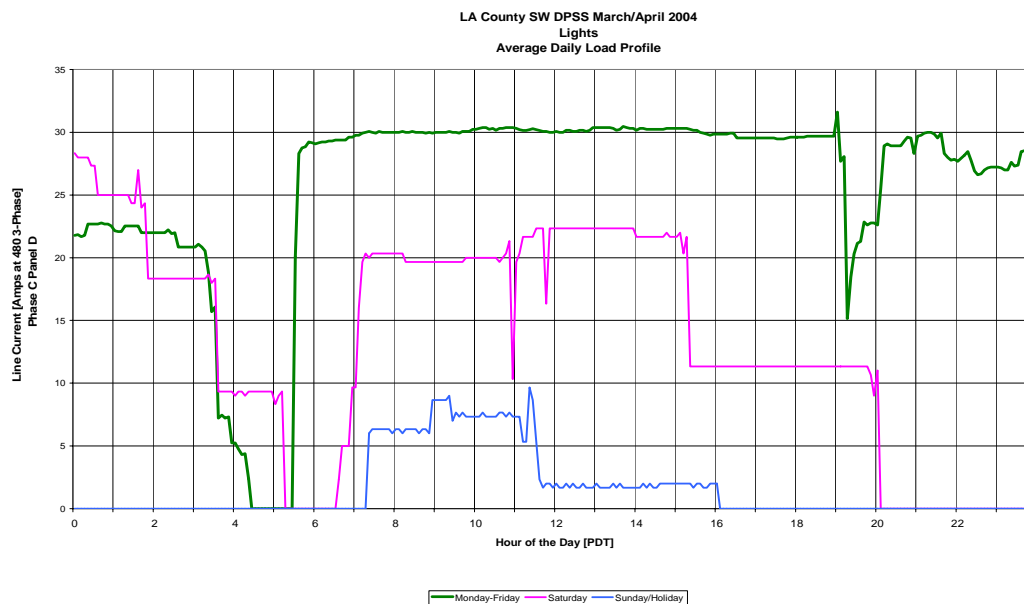


Post-Installation



Panel D: This lighting panel controls office, sales, and HID lights. Power measurements were taken from the main area breakers. The recorded power draw of the lights is 22.88 kW. When the datalogger was installed prior to the retrofit, the main electrical panel was mislabeled, and the datalogger recorded the operation of the parking lot lights. We assume the equivalent full-load operating time of this panel before installation was the same as Panel C, which is similar in loads supplied, or 7,619 hours per year. The post-installation equivalent operating time was 5,833 h/yr. This indicates that the control system actually decreased operating time of the lights by 1,786 hours. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 4,244 hours to 3,375 hours per year.

Post-Installation



Non-Monitored Panels

Three of the panels were not monitored with interval dataloggers because they controlled lights in areas similar to those for which we created load profiles.

Panel A controls lights in the even-numbered rows of the open areas. Since Panel B controls the lights in the odd-numbered rows, we assume that Panel A behaves exactly the same as Panel B. Panel A had a power demand of 17.96 kW. **Panel Y** had a power demand of 11.51 kW. According to its circuit legend, it controls lights in a “warehouse,” which we believe to mean an open area of similar occupancy use as the open areas controlled by Panels A and B. Panels A, B, and Y are physically located in the same hallway.

Panel MA had a power demand of 20.63 kW. It is located in the Probation Department area and controls office lights. We assume that it operates similar to Panel C and assigned the same operating hours as derived from Panel C’s load profile.

Energy Savings Calculations

The following table delineates the savings at this site for each of the lighting panels included in the project. The annual savings is the full-load demand (kW) multiplied by the change in equivalent full-load operating hours as determined by comparing the pre- and post-control load profiles for the same locations. Panels with “pre-control hours” and/or “post-control hours” listed in green are those panels for which we assume similar operation to monitored panels.

Southwest DPSS Lighting Control Systems Annual kWh Savings					
Panel Name	Measured kW	Pre-Control Hours	Post-Control Hours	Operating Hour Reduction	kWh Saved
Panel A	17.96	8,760	5,594	3,166	56,861
Panel B	18.29	8,760	5,594	3,166	57,906
Panel C	20.26	7,619	5,211	2,408	48,786
Panel D	22.88	7,619	5,833	1,786	40,864
Panel Y	11.51	8,760	5,594	3,166	36,441
Panel MA	20.63	7,619	5,211	2,408	49,677
Total/Avg.	111.53	8,190	5,506	2,683	290,535

The control systems were installed late in the program and had not been implemented to their full or planned capability at the time of our post-installation data collection. The systems allow programming at the individual circuit level, and the control operation of the circuit breakers can be overridden at the panel by pushing a button on the breaker.

Energy Management Division plans for the Southwest DPSS building call for 3,375 hour per year operation throughout the facility. The table on the following page presents the energy savings that each panel would achieve if its lights were operated 3,375 hours per year.

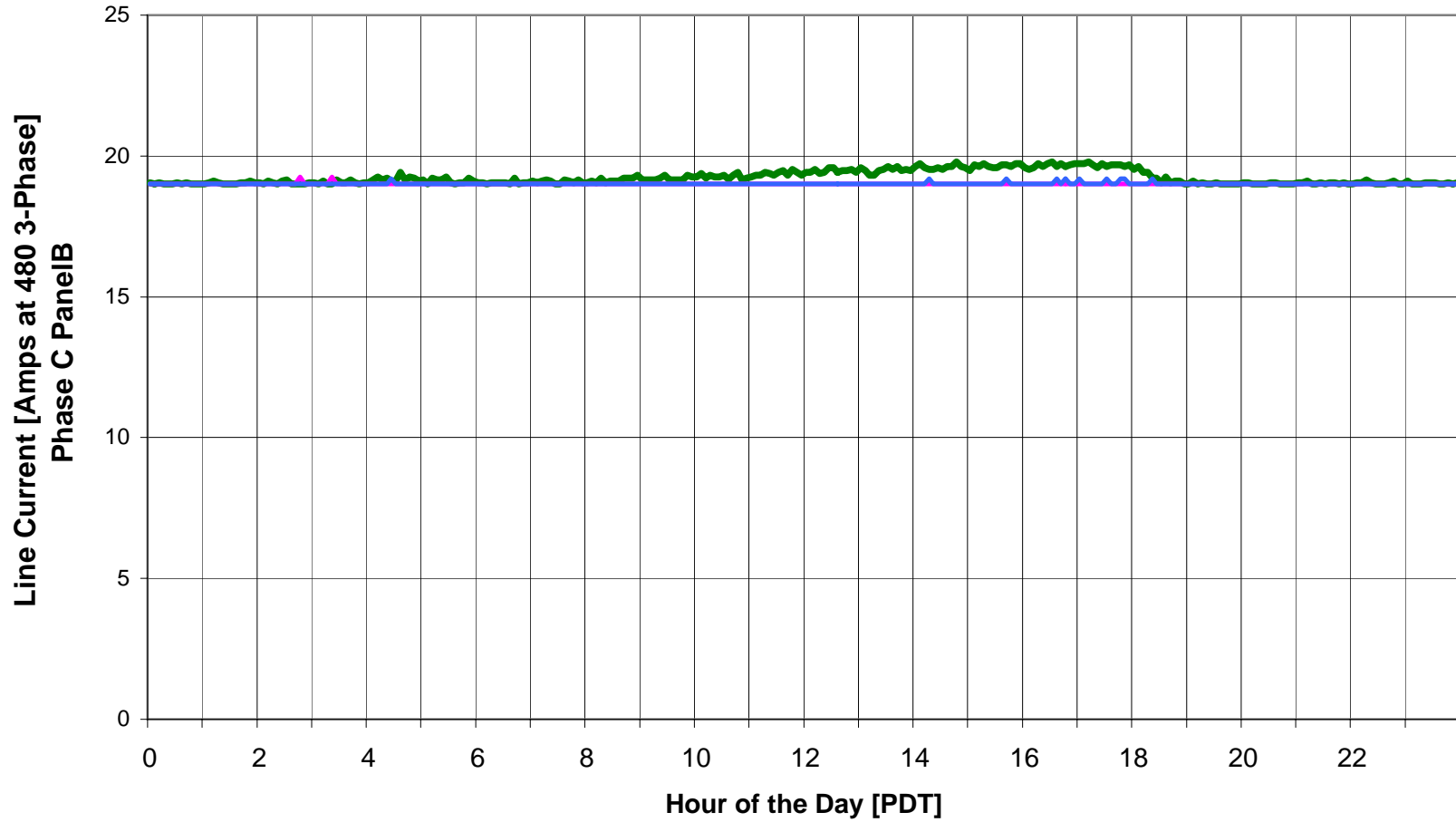
Southwest DPSS Lighting Control Systems Annual kWh Savings (Proposed)					
Panel Name	Measured kW	Pre-Control Hours	Proposed Control Hours	Operating Hour Reduction	kWh Saved
Panel A	17.96	8,760	3,375	5,385	96,715
Panel B	18.29	8,760	3,375	5,385	98,492
Panel C	20.26	7,619	3,375	4,244	85,983
Panel D	22.88	7,619	3,375	4,244	97,103
Panel Y	11.51	8,760	3,375	5,385	61,981
Panel MA	20.63	7,619	3,375	4,244	87,554
Total/Avg.	111.53	8,190	3,375	4,815	527,827

The proposal measure unit for building controls was square feet of building area, with a total savings estimate of 1.31134 kWh/yr-ft². The Southwest DPSS building is 153,896 ft². We verified that lighting controls were installed to effectively control the lights throughout the entire building. Thus the *ex-ante* savings estimate is 201,811 kWh per year, which is the same as the county’s estimated savings for this site.

The total *ex-post* evaluation of savings for these control systems is 290,535 kWh per year as operating at the time of our metering. However, we are aware that the system had been installed late in the program period and that it was not fully commissioned during our metering period (which had to be completed in order to prepare this report in a timely manner).

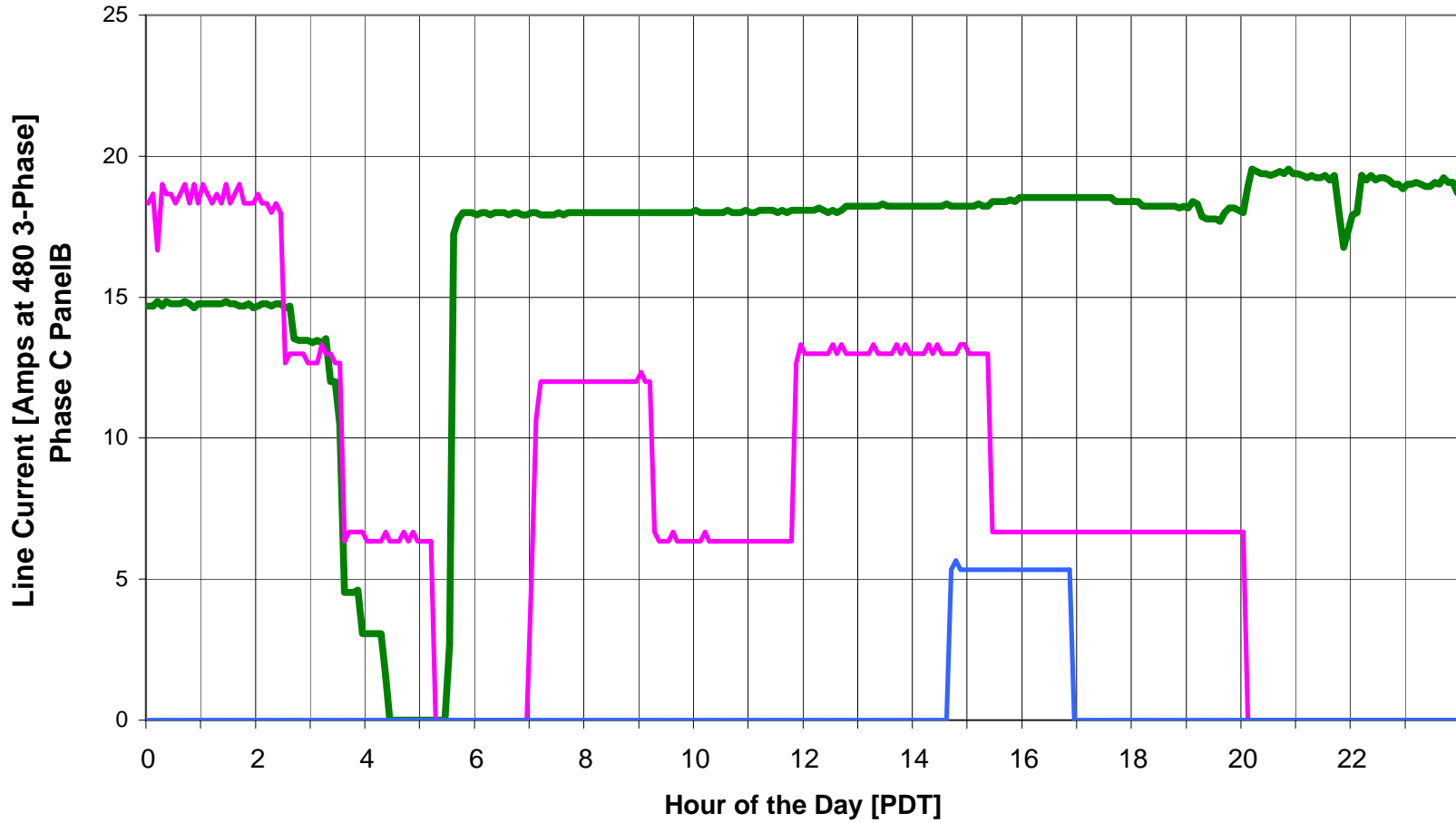
If the control system reduces hours to the extent proposed (3,375 h/yr) the total savings will be 527,827 kWh/year, which is a “potential *ex-post*” energy savings. We anticipate that the actual operating savings achieved will be between the present number (290,535) and the potential (527,827), and that actual savings significantly exceeding the originally proposed value (201,811).

LA County SW DPSS May 2003
Lights
Average Daily Load Profile



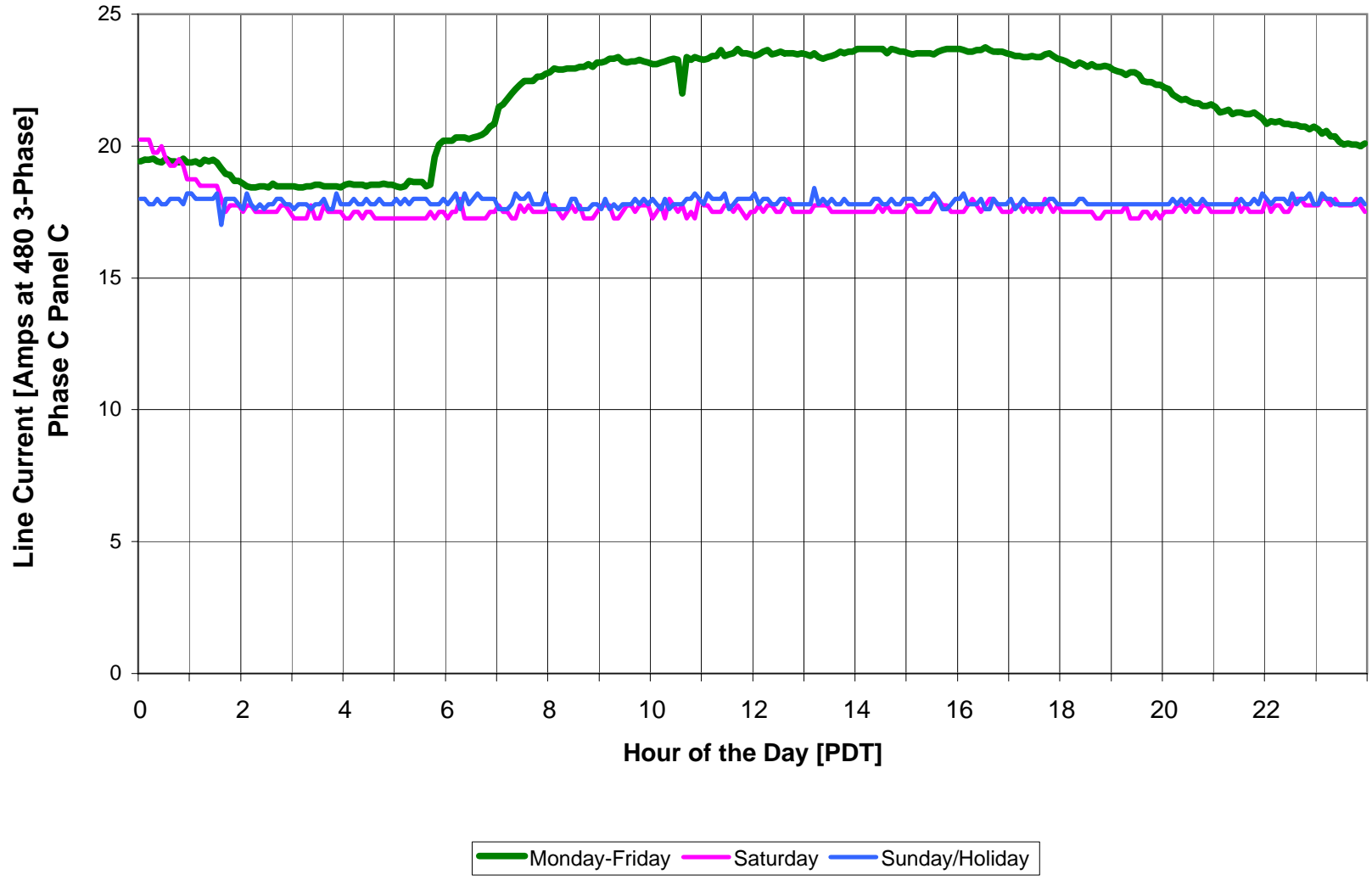
Monday-Friday Saturday Sunday/Holiday

LA County SW DPSS March/April 2004
Lights
Average Daily Load Profile

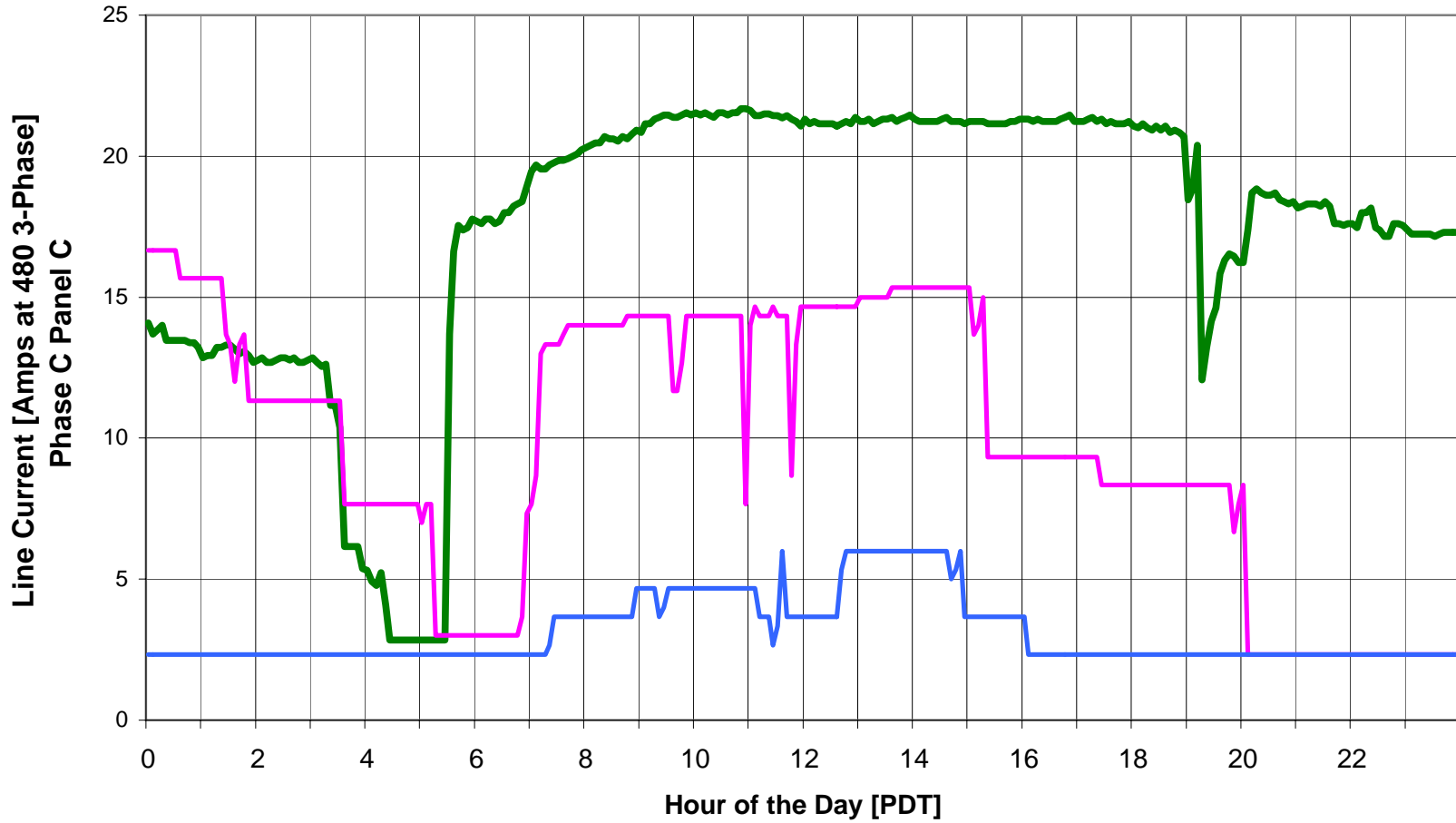


Monday-Friday Saturday Sunday/Holiday

LA County SW DPSS May 2003
Lights
Average Daily Load Profile

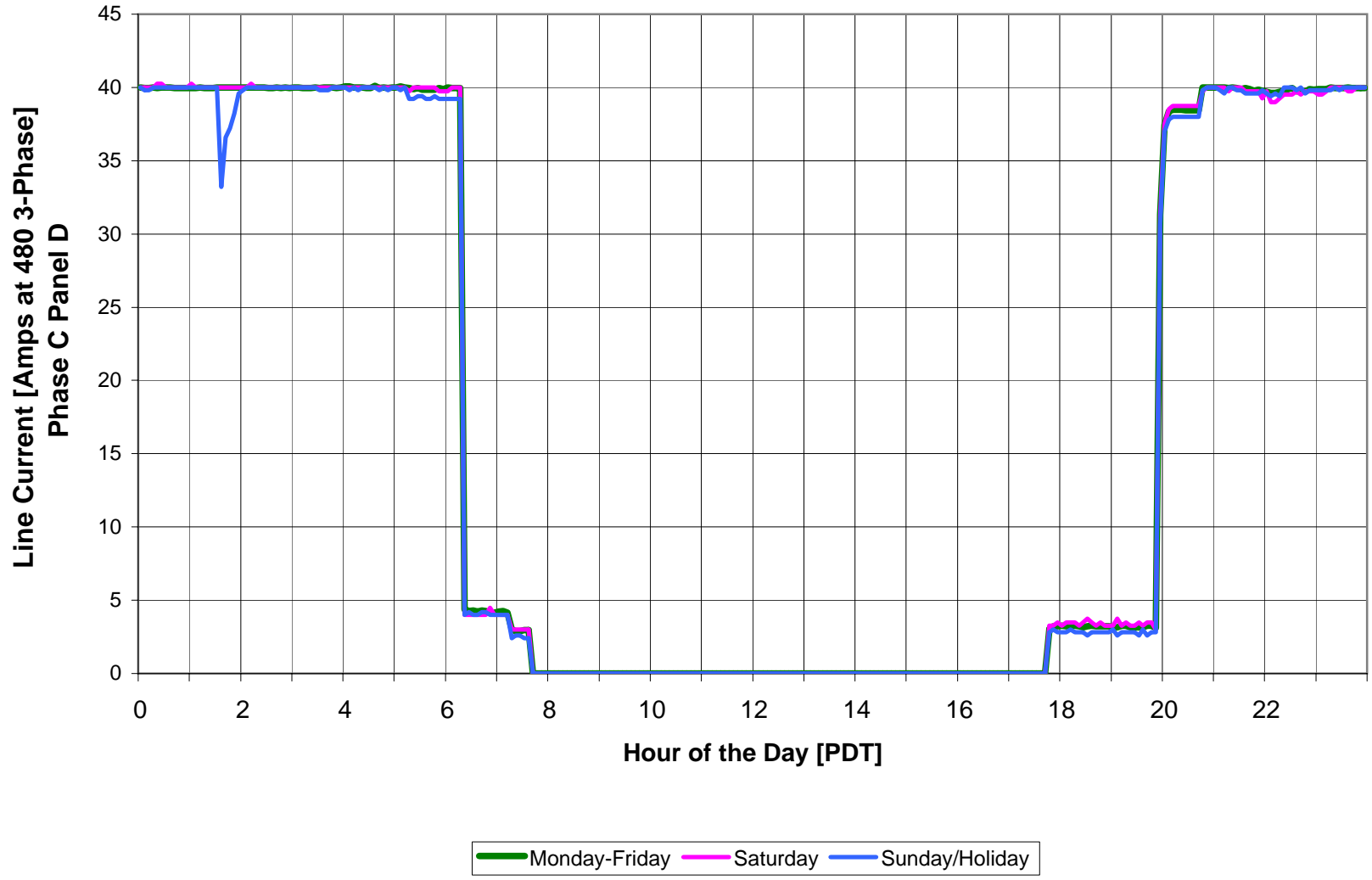


LA County SW DPSS March/April 2004
Lights
Average Daily Load Profile

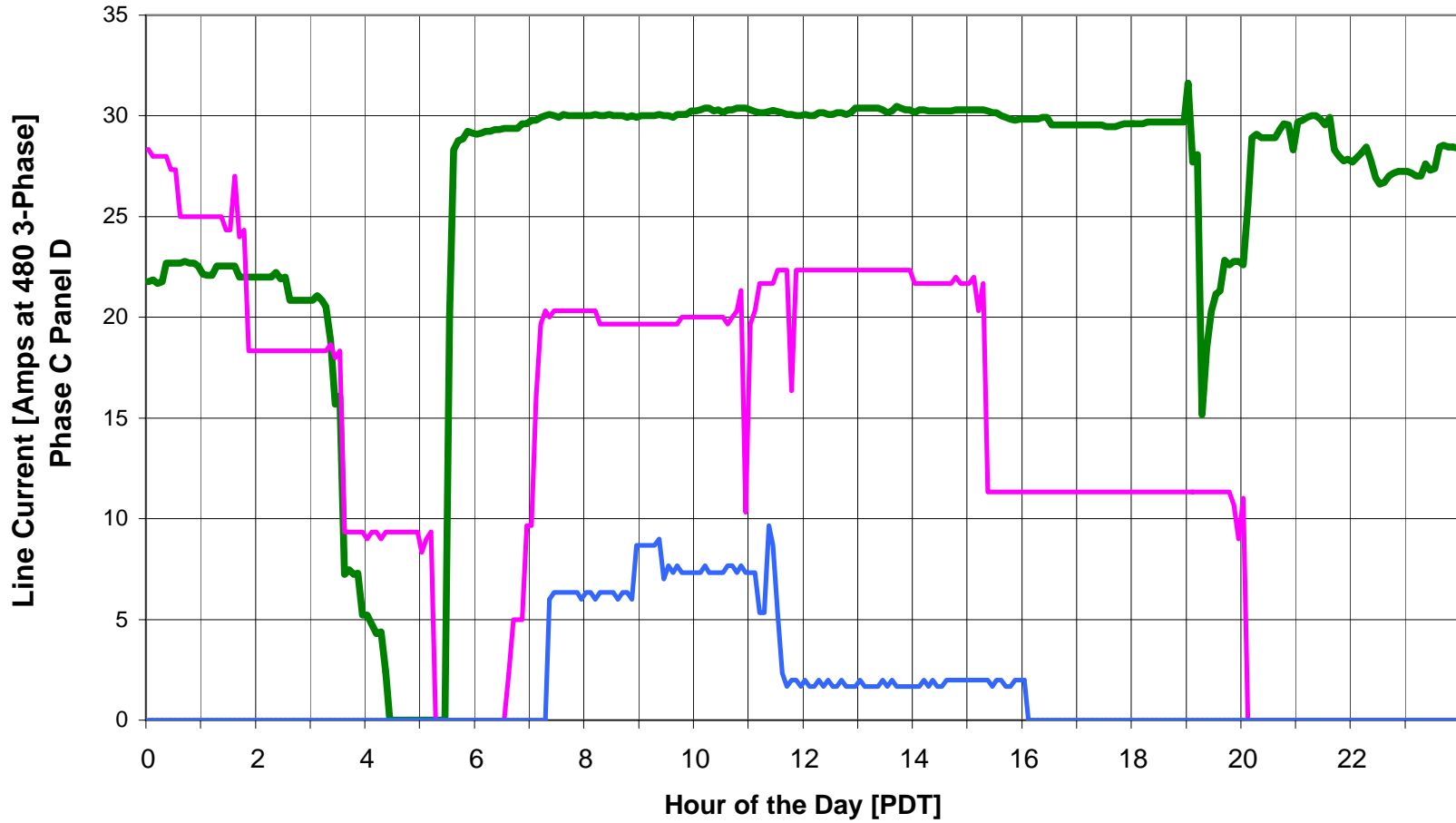


Monday-Friday Saturday Sunday/Holiday

LA County SW DPSS May 2003
Lights
Average Daily Load Profile



LA County SW DPSS March/April 2004
Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday



LA County CPUC Local Program #156-02

Site 21 - Southwest DPSS

Main Breaker Feed to Panel A					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	23.36	6.49	6.57	1.01	0.99
B	22.50	6.27	6.35	0.98	0.99
C	18.77	5.20	5.26	0.80	0.99
TOT/AVG	21.54	17.96	18.18	2.79	0.99

No further adjustments needed for Panel A

Main Breaker Feed to Panel B					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	25.79	7.21	7.31	1.19	0.99
B	21.00	5.90	5.98	0.99	0.99
C	18.61	5.18	5.25	0.86	0.99
TOT/AVG	21.80	18.29	18.54	3.04	0.99

No further adjustments needed for Panel B

Main Breaker Feed to Panel C					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	27.16	7.21	8.85	2.70	0.94
B	29.41	7.75	8.12	3.14	0.93
C	19.49	5.30	8.65	1.38	0.97
TOT/AVG	25.35	20.26	25.62	7.22	0.95

No further adjustments needed for Panel C



LA County CPUC Local Program #156-02

Site 21 - Southwest DPSS

Main Breaker Feed to Panel D					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	30.97	7.60	8.85	4.51	0.86
B	28.73	6.95	8.12	4.21	0.86
C	31.02	8.33	8.65	2.31	0.96
TOT/AVG	30.24	22.88	25.62	11.03	0.89

No further adjustments needed for Panel D



LA County CPUC Local Program #156-02

Site 21 - Southwest DPSS

Main Breaker Feed to Panel MA					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	24.57				
B	24.18				
C	25.72				
TOT/AVG	24.82				

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Main Incoming Phases	24.57	24.18	25.72		
Current Total	24.57	24.18	25.72		
Real Power [kW] Total	6.81	6.70	7.12		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel MA Adjusted Power Readings		
Phase	Current	Real P [kW]
A	0.00	-6.81
B	0.00	-6.70
C	0.00	-7.12
TOT/AVG		-20.63



LA County CPUC Local Program #156-02

Site 21 - Southwest DPSS

Main Breaker Feed to Panel Y *					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	29.69	7.83	8.30	2.93	0.93
B (Power Estimated)	32.70	9.03			0.96
C	31.23	8.75	8.87	1.61	0.99
TOT/AVG	31.21	25.61	17.17	4.54	0.96

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
19,21,23 3-ph breaker	13.20	6.30	7.90		
20,22,24 3-ph breaker	6.30	8.30	8.90		
Plug Loads					
Current Total	19.50	14.60	16.80		
Real Power [kW] Total	5.40	4.04	4.65		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel Y Adjusted Power Readings		
Phase	Current	Real P [kW]
A	10.19	2.43
B	18.10	4.98
C	14.43	4.10
TOT/AVG	14.24	11.51

Southwest DPSS – 1326 W. Imperial Hwy



Building Front



Hallway Panels A, B, Y



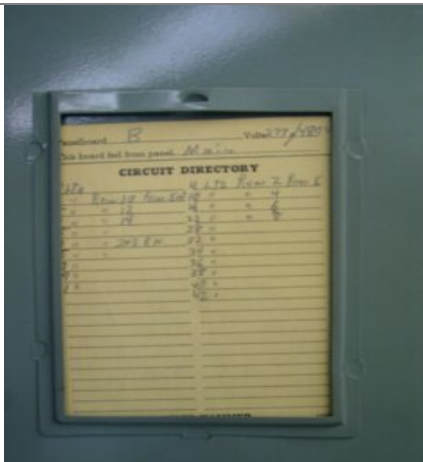
Panel A



Panel A Schedule



Panel B



Panel B Schedule

Southwest DPSS – 1326 W. Imperial Hwy



Parking Lighting Control System

PARKE INDUSTRIES, Inc.
2045 Lindsey Way
Gardena, CA 91748
800-367-0753

TERMINAL LIST

Date: 5/20/96

Project:	Terminal	Device	Leads	Connection	Notes
South West DPSS	1	Contactor #1	C-7	L1	Lighting Zone #1
	2	Contactor #1	C-1	T1	Lighting Zone #1
	3	Contactor #1	C-9	L2	Lighting Zone #1
	4	Contactor #1	C-1	L3	Lighting Zone #1
	5	Contactor #1	C-11	L2	Lighting Zone #1
	6	Contactor #1	C-13	L1	Lighting Zone #1
	7	Contactor #1	C-1	L4	Lighting Zone #1
	8	Contactor #1	C-15	L1	Lighting Zone #1
	9	Contactor #2	C-17	L2	Lighting Zone #1
	10	Contactor #2	C-2	T1	Lighting Zone #1
	11	Contactor #2	C-17	L2	Lighting Zone #1
	12	Contactor #2	C-2	T2	Lighting Zone #1
	13	Contactor #2	D-2	L3	Lighting Zone #1
	14	Contactor #2	D-9	L4	Lighting Zone #1
	15	Contactor #2	D-9	L4	Lighting Zone #1
	16	Contactor #2	D-6	L1	Lighting Zone #1
	17	Contactor #3	D-6	L1	Lighting Zone #2
	18	Contactor #3	D-8	L2	Lighting Zone #2
	19	Contactor #3	D-8	L2	Lighting Zone #2
	20	Contactor #3	D-10	L3	Lighting Zone #2
	21	Contactor #3	D-3	T2	Lighting Zone #2
	22	Contactor #3	D-10	L3	Lighting Zone #2
	23	Contactor #3	D-3	T3	Lighting Zone #2
	24	Contactor #3	D-12	L4	Lighting Zone #2
	25	Contactor #4	D-14	L1	Lighting Zone #2
	26	Contactor #4	D-14	L1	Lighting Zone #2
	27	Contactor #4	D-14	L1	Lighting Zone #2
	28	Contactor #4	D-14	L2	Lighting Zone #2
	29	Contactor #4	D-14	L3	Lighting Zone #2
	30	Contactor #4	D-14	L3	Lighting Zone #2
	31	Contactor #4	D-4	L4	Lighting Zone #2
	32	Contactor #4	D-4	L4	Lighting Zone #2
	33	Contactor #4	D-4	L4	Lighting Zone #2
	34	Transformer #1	TR-1	H2	277-120 Transformer
	35	Transformer #1	TR-1	H2	277-120 Transformer

Parking Lighting Control System Schedule

Site Measurement and Verification Report

Site Number 22

Downey Administration Center Lighting Controls

9150 E. Imperial Highway, Downey

SCE Account 3-011-5029-00

Annual Energy Savings Estimates from Lighting Controls	
Building Area	357,342 ft ²
LA County Estimate at 1.31 kWh/ft ²	468,599 kWh
<i>Ex-Ante</i> Evaluation	468,599 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	325,201 kWh
Potential <i>Ex-Post</i> Savings	561,697 kWh

Site Description

The Downey Administration Center is a single main two-story building. It comprises 357,342 square feet of floor space. The facility is an administration center for multiple departments of the County of Los Angeles. The building includes a large open space containing cubicles upstairs. The first floor is mainly offices and a cafeteria.

Controls Locations

A total of twelve new control units were installed on the lighting panels as part of the energy efficiency program. All of the old panels were replaced with new Square D panels. Some of the old lighting panels upstairs had been split-bus panels; these panels were removed and replaced with the new Square D panels in which individual circuits breakers can be controlled or not controlled.

Preliminary Site Visit

The site was visited on March 26, 2003. Rudy Tovar escorted us throughout the facility. During this visit we installed six dataloggers in panels K, L, M, B, G, and 2J235. We also took power measurements on these six panels. Dataloggers were installed to gather data that can be displayed in a load profile. The load profile will show the operating hours of the lights before the new control system is installed. These load profiles and equivalent operating hours were then compared with those determined from metering at the same locations taken after the controls were installed and operational.

Post-Retrofit Audit

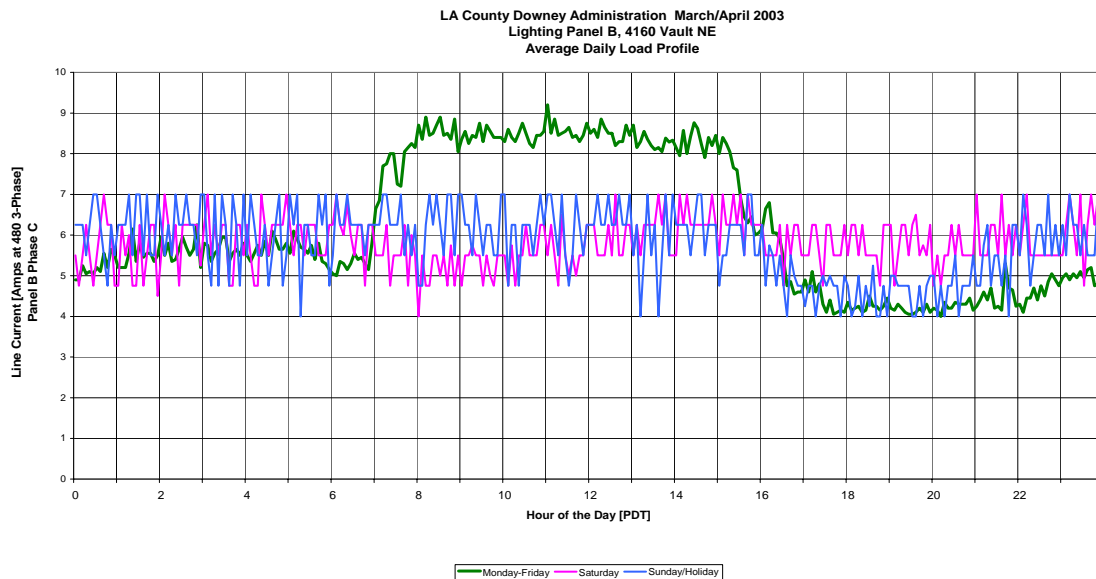
The site was again visited on March 4, 2004. During this visit we used the same dataloggers and measured the same panels as we did in the preliminary site visit. In addition we measured power demand at the additional lighting panels for which load profiles were not gathered. These additional lighting panels are very similar in operation to some of the panels we did monitor both before and after the retrofit.

Metered Load Profiles

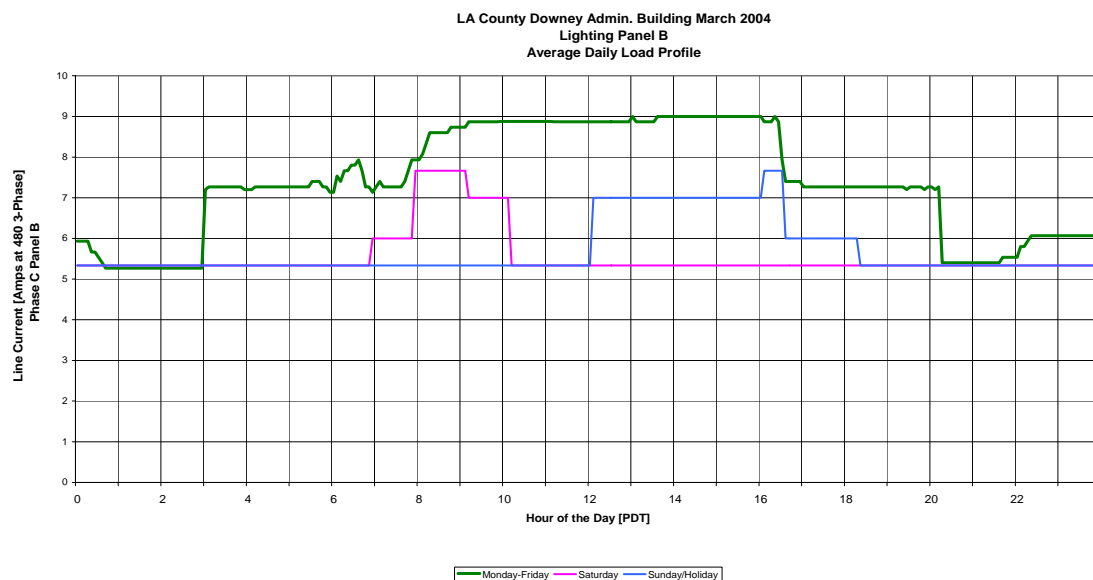
Although the facility is occupied and operational on a continuous basis, many areas are not in fact used throughout the night and weekends. We collected interval data for lighting loads in six lighting panels. To the extent possible we metered the same phase of the same panel with the same datalogger, thus assuring the comparative aspect of the pre- and post-installation data. We discovered after the fact that the electricians did not necessarily hook the phases up to the new panel in the same order, and this resulted in current level discrepancies in the pre- and post-installation data. This should not, however, affect the operating hours calculations.

Panel B: This lighting panel controls a variety of small offices. This panel is located on the first floor, and the power measurements were taken from the feeder breaker in the northeast electrical vault. The recorded power draw of the lights on this panel was 9.97 kW. The equivalent full-load operating time before installation was 6,280 hours per year. The post-installation equivalent operating time was 6,652 h/yr. This indicates that the control system actually increased operating time of the lights. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 2,030 hours to 4,250 hours per year.

Pre-Installation

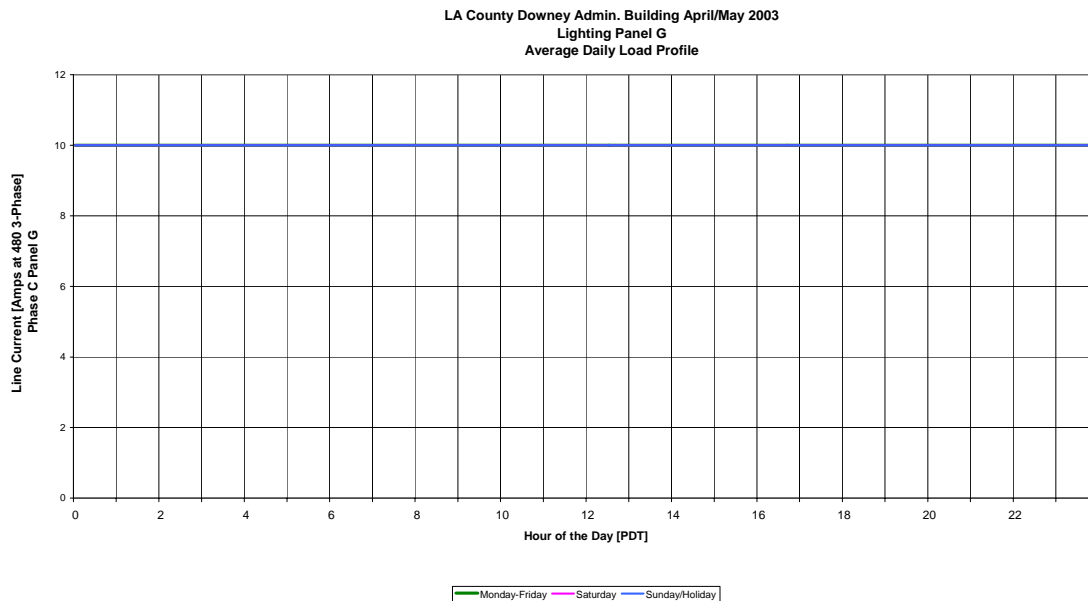


Post-Installation

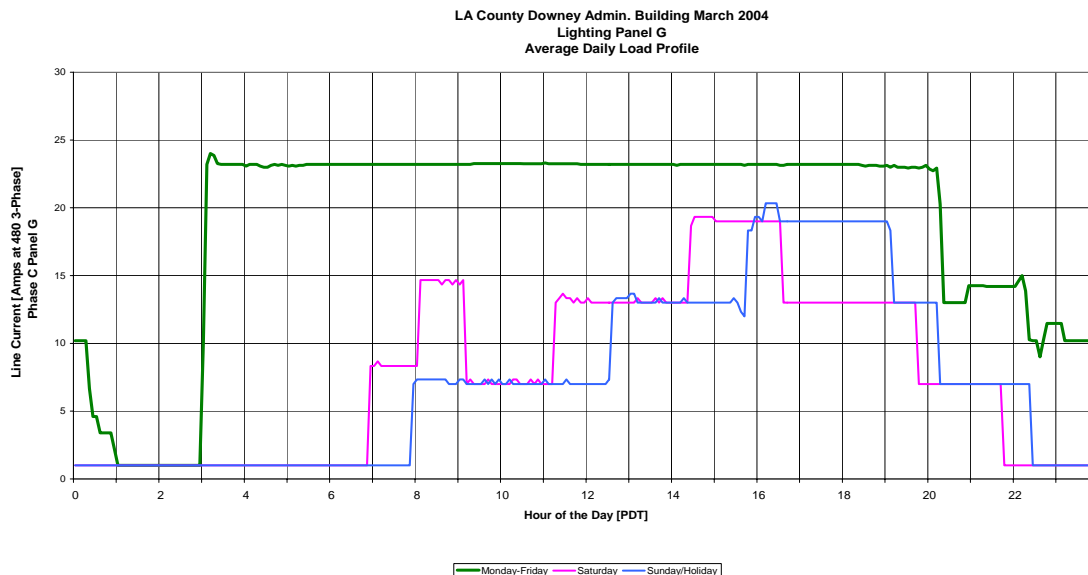


Panel G: This lighting panel controls lights in the open space upstairs, specifically Area “G.” Power measurements were recorded from the actual panel. The recorded power draw of the lights on this panel was 23.22 kW. Before installation the lights operated continuously, 8,760 hours per year. The post-installation equivalent operating time was 5,858 h/yr, indicating the system reduced operating time by 2,902 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 4510 hours to 4,250 hours per year.

Pre-Installation

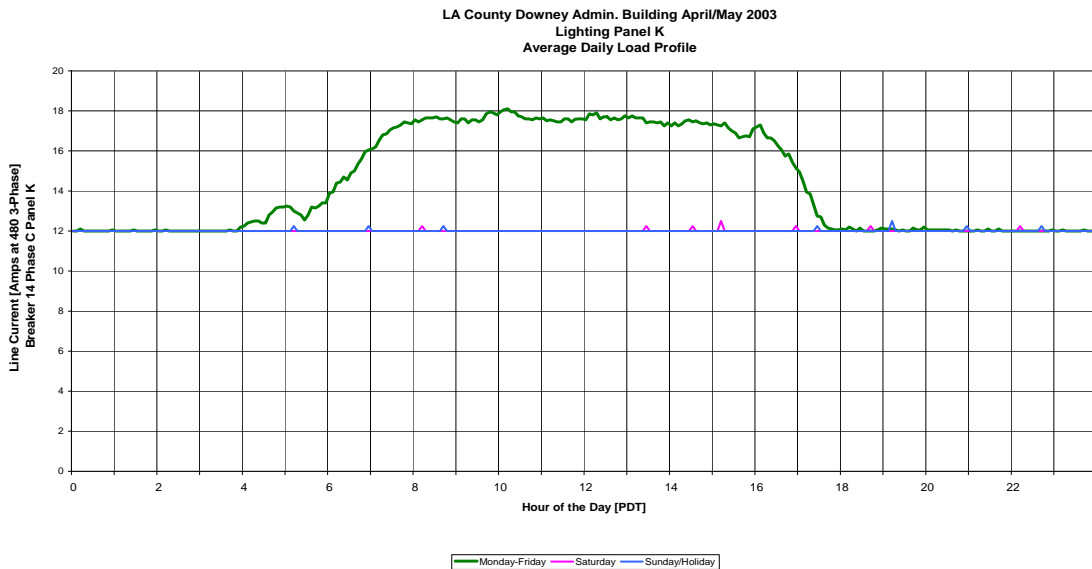


Post-Installation

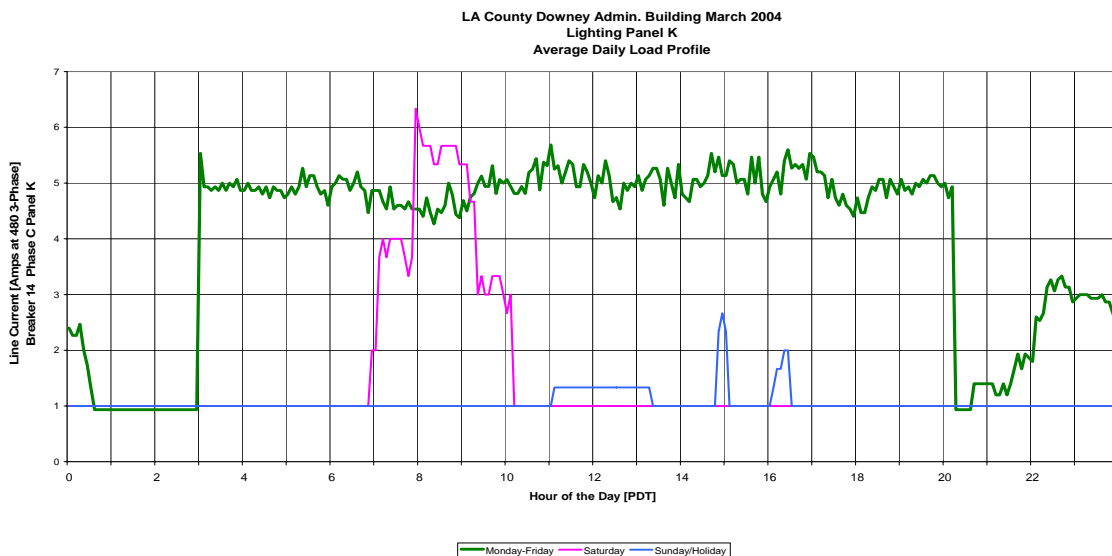


Panel K: This lighting panel controls lights in the hallway and offices on the first floor. The panel is located next to the electrical vault room. Power measurements were taken from the main breaker in Distribution Panel PP2. The recorded power draw of the lights on this panel was 12.49 kW. Before installation the full-load equivalent operating time of the lights was 6,318 hours per year. The post-installation equivalent operating time was 3,962 h/yr, indicating the system reduced operating time by 2,356 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 2,068 hours to 4,250 hours per year.

Pre-Installation

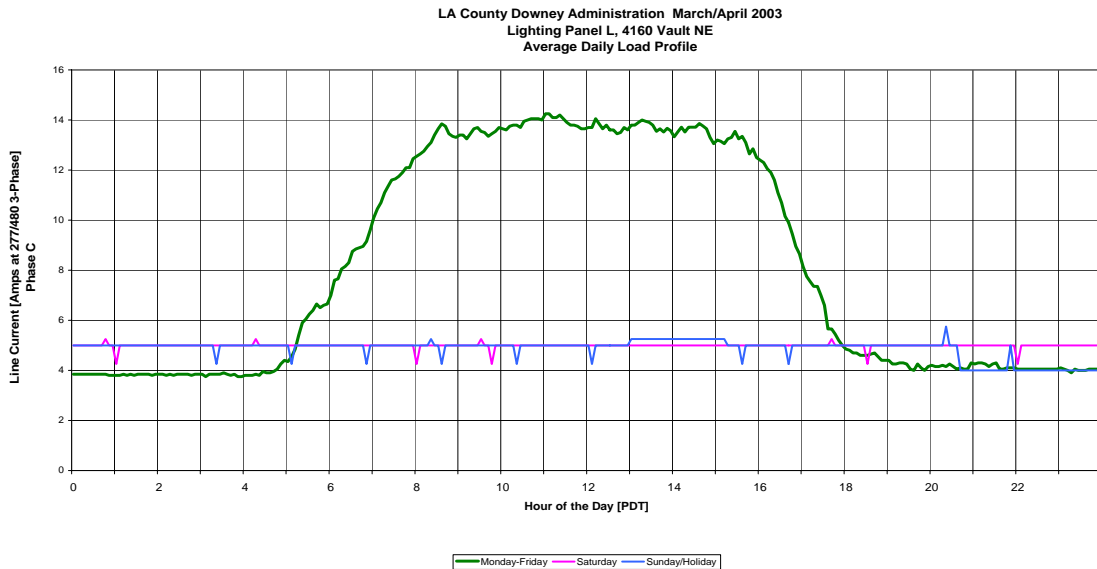


Post-Installation

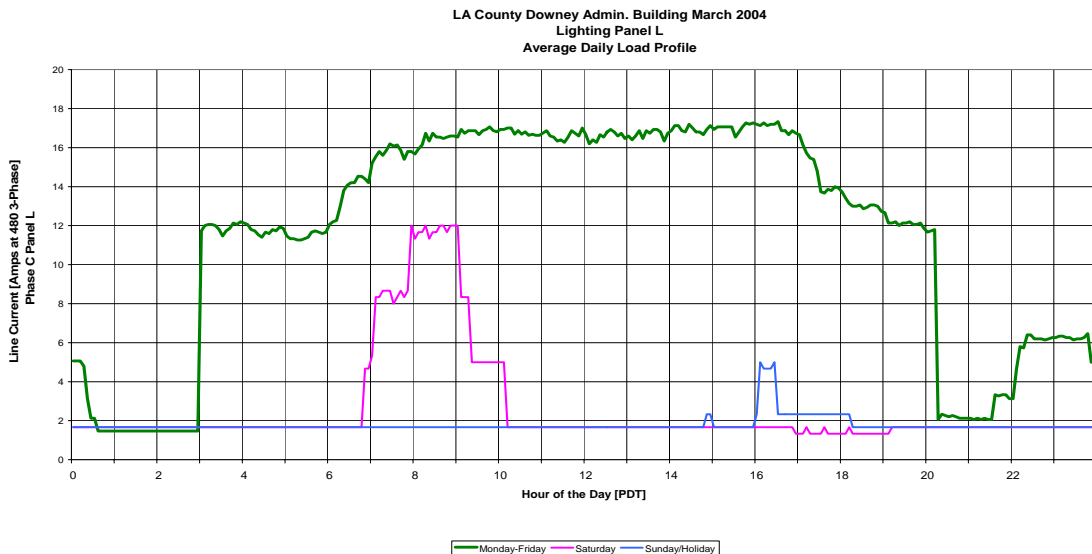


Panel L: This lighting panel controls lights in the hallway and offices on the first floor. The panel is located next to the electrical vault room. Power measurements were taken from the feeder breaker in Distribution Panel PP4. The recorded power draw of the lights on this panel was 18.15 kW. The equivalent full-load operating time before installation was 3,689 hours per year. The post-installation equivalent operating time was 4,484 h/yr. This indicates that the control system actually increased operating time of the lights. If the controls are fully programmed and operate as proposed the operating time of the lights will increase by 561 hours to 4,250 hours per year.

Pre-Installation

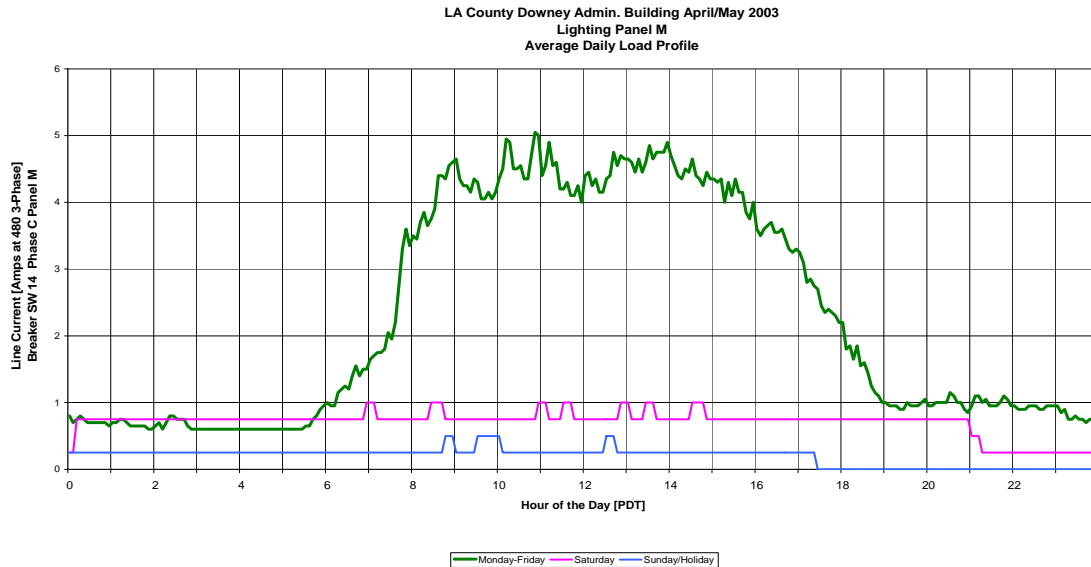


Post-Installation

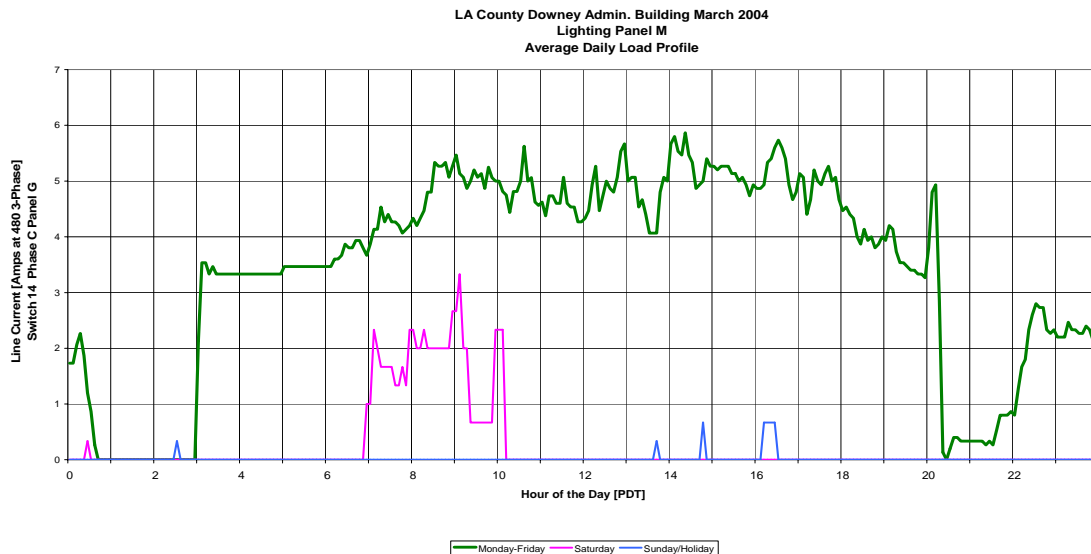


Panel M: This lighting panel controls lights in closed offices on the first floor. Power measurements were taken from the feeder breaker in Distribution Panel PP4 located in the electrical vault room. The recorded power draw of the lights on this panel was 5.87 kW. The equivalent full-load operating time before installation was 2,133 hours per year. The post-installation equivalent operating time was 3,013 h/yr. This indicates that the control system actually increased operating time of the lights. If the controls are fully programmed and operate as proposed the operating time of the lights will increase by 2117 hours to 4,250 hours per year.

Pre-Installation

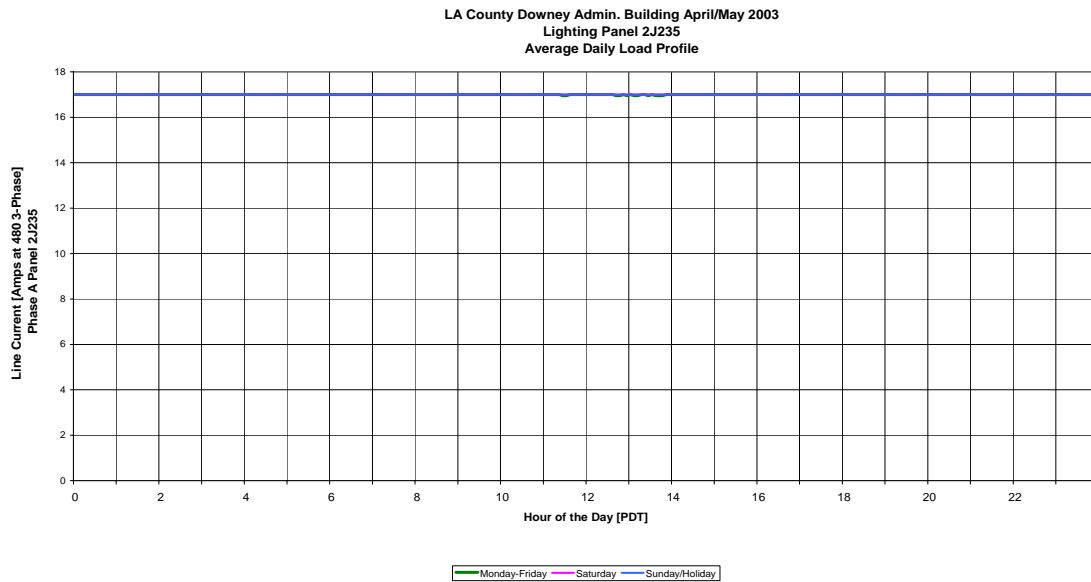


Post-Installation

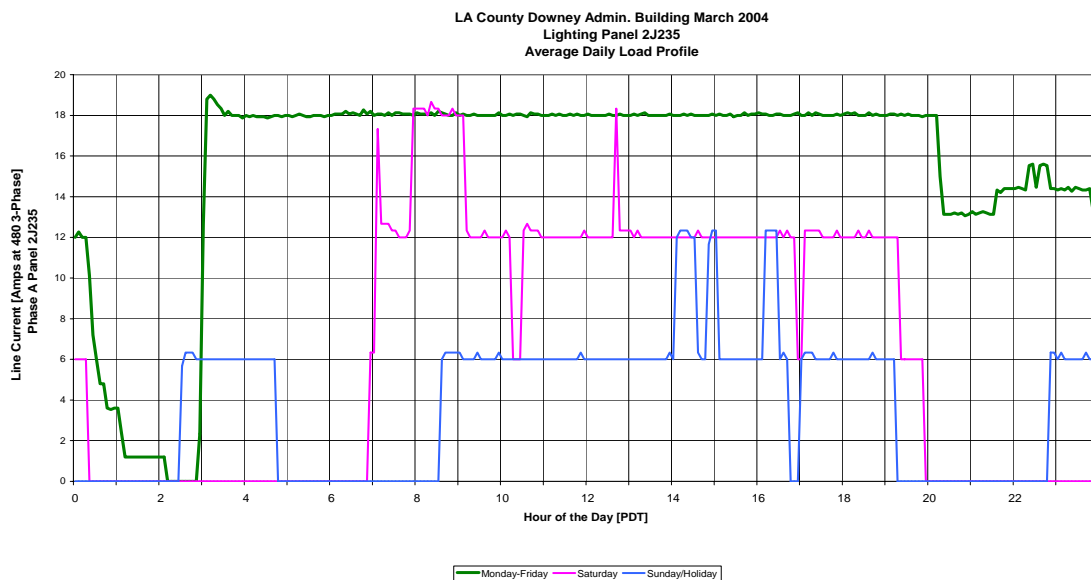


Panel 2J235: This lighting panel controls lights upstairs in the open cubicle area. The panel is located upstairs; power measurements were taken directly from the panel. The recorded power draw of the lights on this panel was 15.70 kW. Before installation the lights operated continuously, 8,760 hours per year. The post-installation equivalent operating time was 5,974 h/yr, indicating the system reduced operating time by 2,786 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 4510 hours to 4,250 hours per year.

Post-Installation



Post-Installation



Non-Monitored Panels

Six of the panels were not monitored with interval dataloggers because they controlled lights in areas similar to those for which we created load profiles.

In general we found that the control system saves considerable energy in the open areas, particularly when these areas tended to be lit twenty-four hours per day. In office areas, we found that the control system actually increases operating time, apparently because occupants are less likely to control their own lights by shutting them off when not in their office or when going home for the day.

The measurements for Panel 2J235, located in the upstairs open cubicle area, are the most applicable to all the open areas. Five additional panels are estimated to operate in a similar fashion. **Panel F** controls lights in the open space upstairs and is located in the probation area on the second floor. It had a power demand of 24.44 kW. **Panel G69** also controls lights in the open space upstairs. It had a power demand of 7.72 kW. **Panel LI** is another panel that controls lights in the open space upstairs. It is located in the auditors' area upstairs and had a power demand of 8.65 kW. **Panel N** is located in the kitchen area and controls lights in the cafeteria and dining room. It has some motor loads on it in addition to lights. The lighting power demand was 17.15 kW. **Panel 2E235** controls lights upstairs in the open area with cubicles. Its power demand was 17.45 kW. These panels were assigned the 2,786 h/yr decrease in operating time measured on Panel 2J235.

The one remaining panel without a direct load profile, **Panel E**, controls lights in closed offices very similar to those controlled by Panel M. Panel E is located near the elevator in the southeast corner on the second floor. Its power demand was 2.43 kW. It was assigned the 880 h/yr increase in operating time measured on Panel M.

Energy Savings Calculations

The following table demonstrates the savings by the difference between the post-install kWh and the pre-install kWh for each lighting panel that is part of the project.

The table on the following page delineates the savings at this site for each of the lighting panels included in the project. The annual savings is the full-load demand (kW) multiplied by the change in equivalent full-load operating hours as determined by comparing the pre- and post-control load profiles for the same locations. Negative numbers indicate increased operation after the controls were installed and result in increased energy consumption on these panels. Panels with "pre-control hours" and "post-control hours" printed in blue are those panels for which we assume similar operation to monitored panels, in most case Panel 2J235.

Downey Administration Lighting Control Systems Annual kWh Savings (Measured Operating Hours)					
Panel Name	Measured kW	Pre-Control Hours	Post-Control Hours	Operating Hour Reduction	kWh Saved
Panel B	9.97	6280	6652	-372	-3,709
Panel E	2.43	2133	3013	-880	-2,138
Panel F	24.44	8760	5974	2786	68,090
Panel G	23.22	8760	5858	2902	67,384
Panel G69	7.72	8760	5974	2786	21,508
Panel K	12.49	6318	3962	2356	29,426
Panel L	18.15	3689	4484	-795	-14,429
Panel L1	8.65	8760	5974	2786	24,099
Panel M	5.87	2133	3013	-880	-5,166
Panel N	17.15	8760	5974	2786	47,780
Panel 2E235	17.45	8760	5974	2786	48,616
Panel 2J235	15.70	8760	5974	2786	43,740
Total	163.24				325,201

The control systems were installed late in the program and had not been implemented to their full or planned capability at the time of our post-installation data collection. The systems allow programming at the individual circuit level, and the control operation of the circuit breakers can be overridden at the panel by pushing a button on the breaker.

Energy Management Division plans for the Downey building call for 4,250 hour per year operation throughout the facility. The following table presents the energy savings that each panel would achieve if its lights were operated 4,250 hours per year. In some cases, particularly the panels serving individual offices, this would be an increase in operating time, resulting in negative energy savings.

Downey Administration Lighting Control Systems Annual kWh Savings (Proposed Operating Hours)					
Panel Name	Measured kW	Pre-Control Hours	Proposed Control Hours	Operating Hour Reduction	kWh Saved
Panel B	9.97	6280	4250	2030	20,239
Panel E	2.43	2133	4250	-2117	-5,144
Panel F	24.44	8760	4250	4510	110,224
Panel G	23.22	8760	4250	4510	104,722
Panel G69	7.72	8760	4250	4510	34,817
Panel K	12.49	6318	4250	2068	25,829
Panel L	18.15	3689	4250	-561	-10,182
Panel L1	8.65	8760	4250	4510	39,012
Panel M	5.87	2133	4250	-2117	-12,427
Panel N	17.15	8760	4250	4510	77,347
Panel 2E235	17.45	8760	4250	4510	78,700
Panel 2J235	15.70	8760	4250	4510	70,807
Total	163.24				533,943

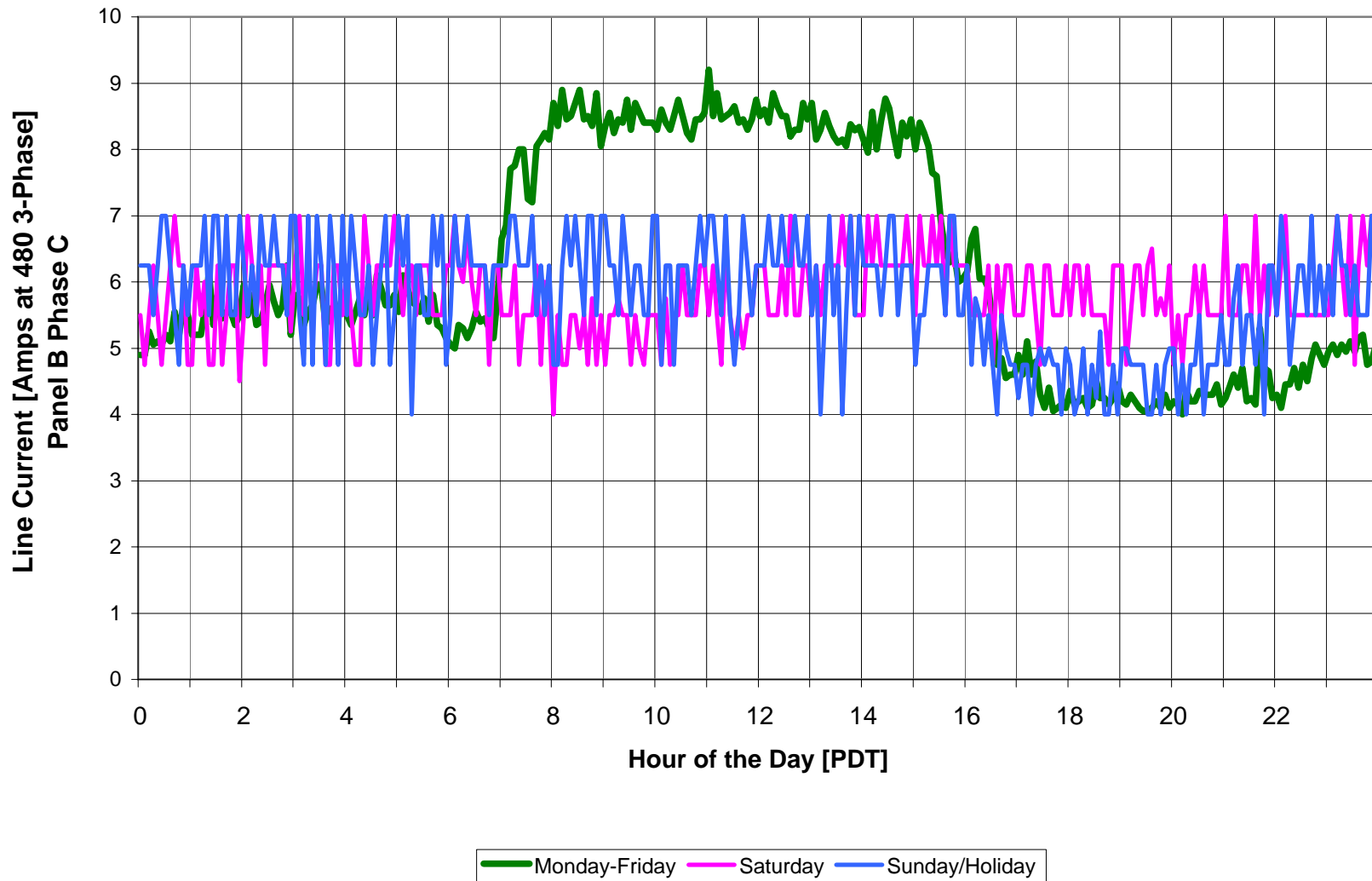
Because of dual controls – system-controlled circuit breakers supplying individual office switches, for example – the control system could be programmed in a manner that it would not result in increased operating hours for those lights already adequately controlled. If the panels with negative savings in the above table are reduced to zero savings, the total building savings is increased from 533,943 kWh per year to 561,697 kWh per year.

The proposal measure unit for building controls was square feet of building area, with a total savings estimate of 1.31134 kWh/yr- ft². The Downey administration building is 357,342 ft². We verified that lighting controls were installed to effectively control the lights throughout the entire building. Thus the *ex-ante* savings estimate is 468,599 kWh per year, which is the same as the county's estimated savings for this site.

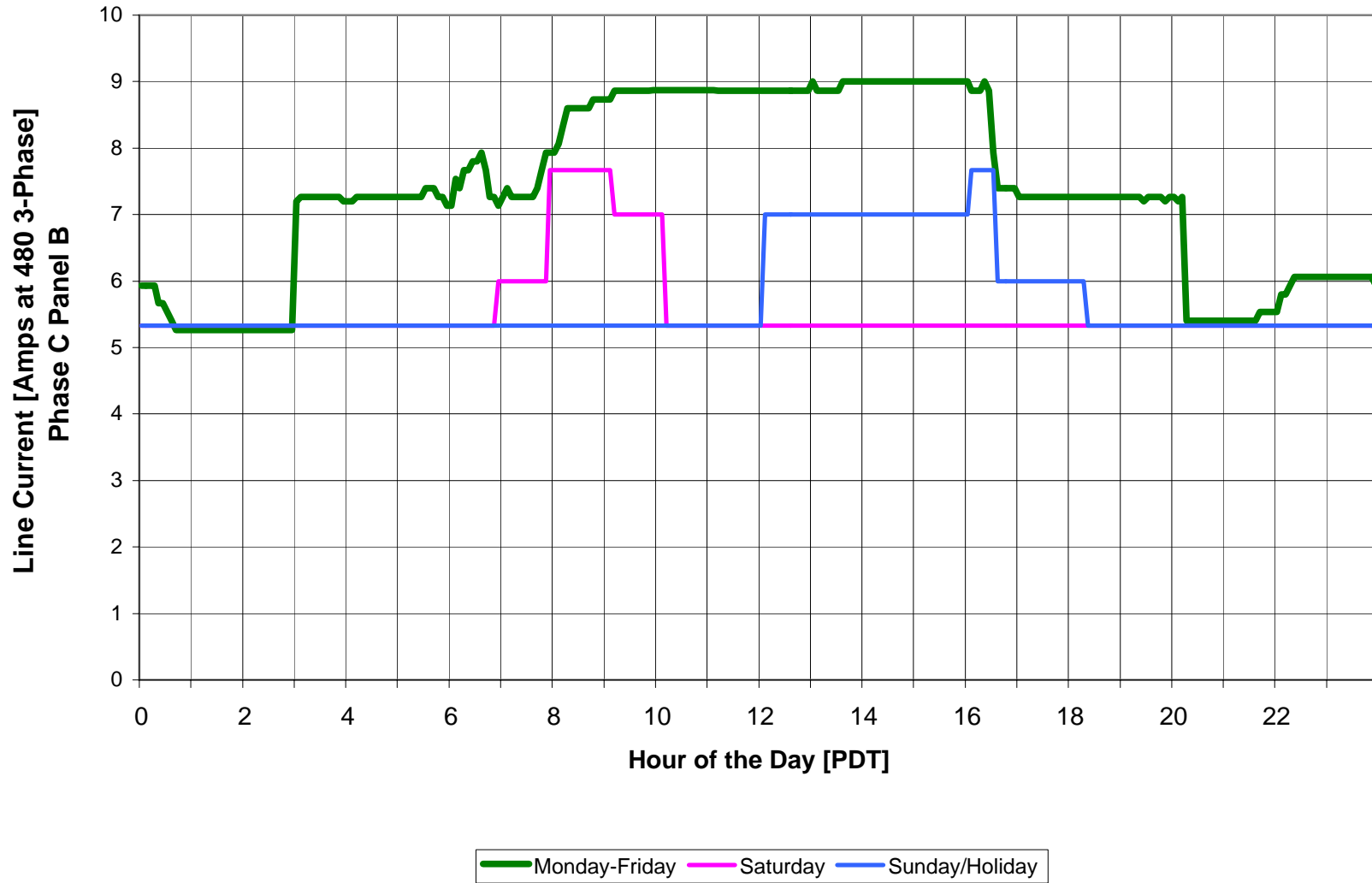
The total *ex-post* evaluation of savings for these control systems is 325,201 kWh per year as operating at the time of our metering. However, we are aware that the system had been installed late in the program period and that it was not fully commissioned during our metering period (which had to be completed in order to prepare this report in a timely manner).

If the control system reduces hours to the extent proposed (4,250 h/yr) and also does not increase operating times in areas where lights already operate less than this amount, the total savings will be 561,697 kWh/year, which is a "potential *ex-post*" energy savings. We anticipate that the actual operating savings achieved will be between the present number (325,201) and the potential (561,697), and that the originally proposed value (468,599) is well within achievability.

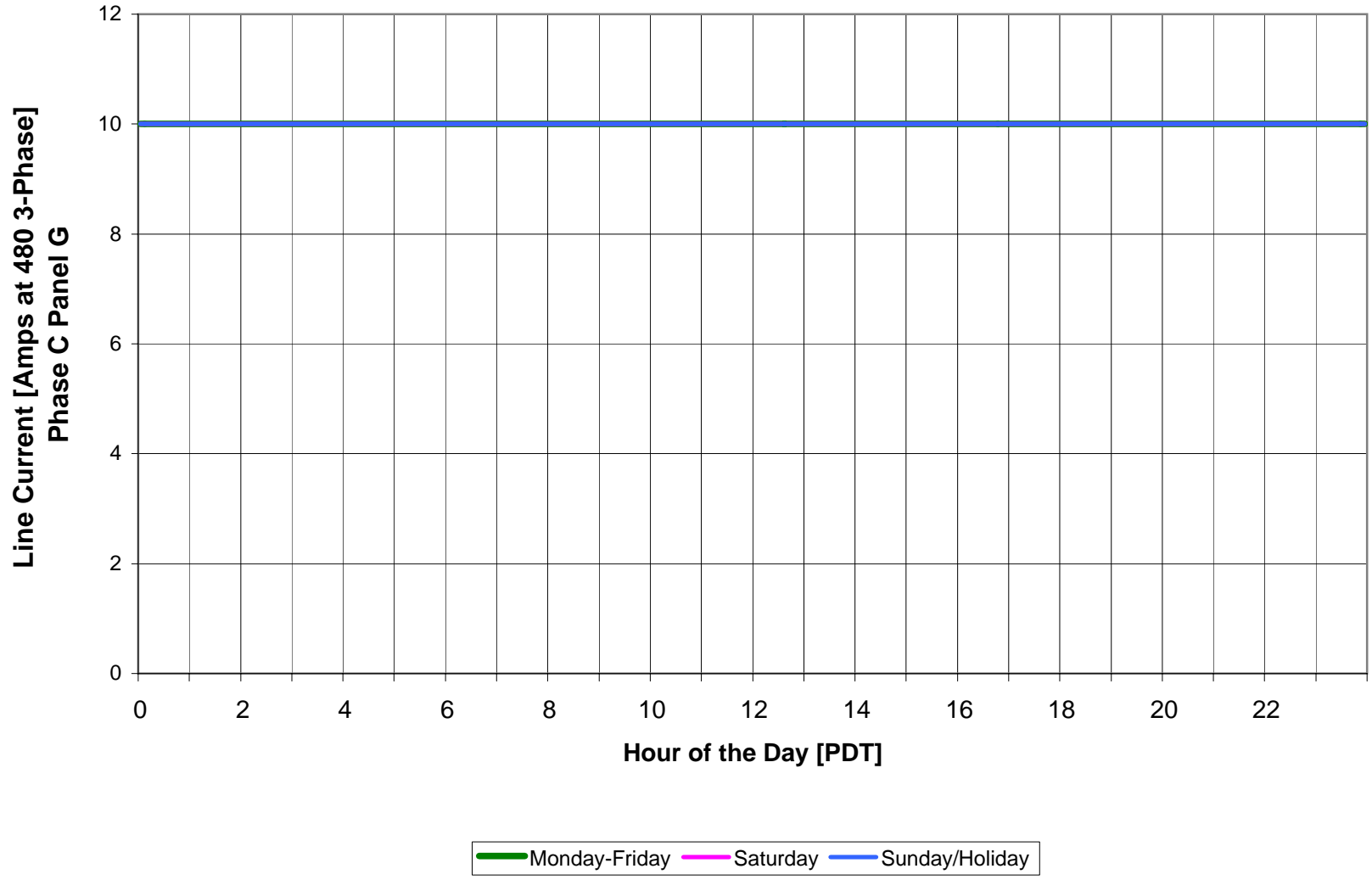
LA County Downey Administration March/April 2003
Lighting Panel B, 4160 Vault NE
Average Daily Load Profile



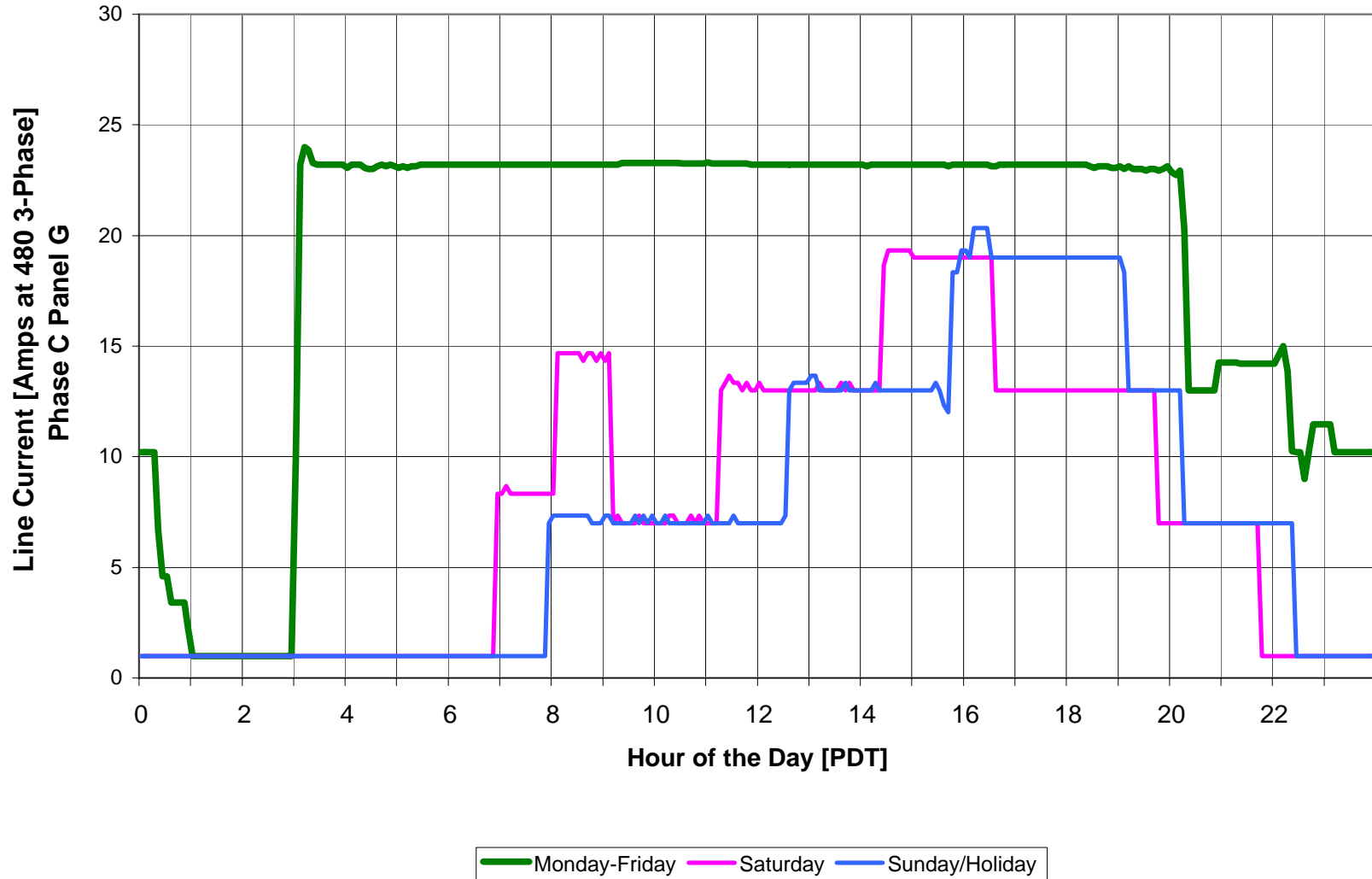
LA County Downey Admin. Building March 2004
Lighting Panel B
Average Daily Load Profile



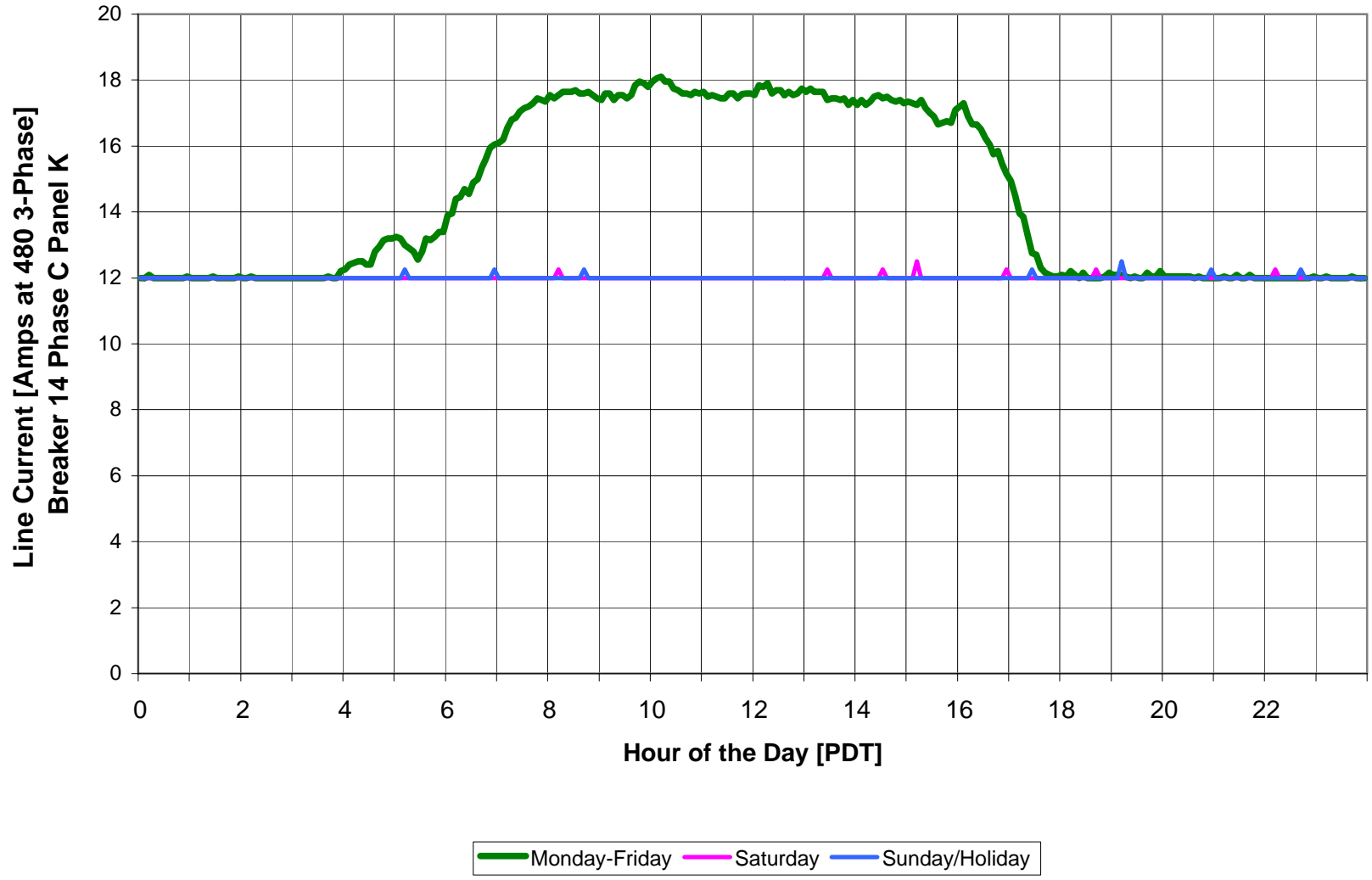
LA County Downey Admin. Building April/May 2003
Lighting Panel G
Average Daily Load Profile



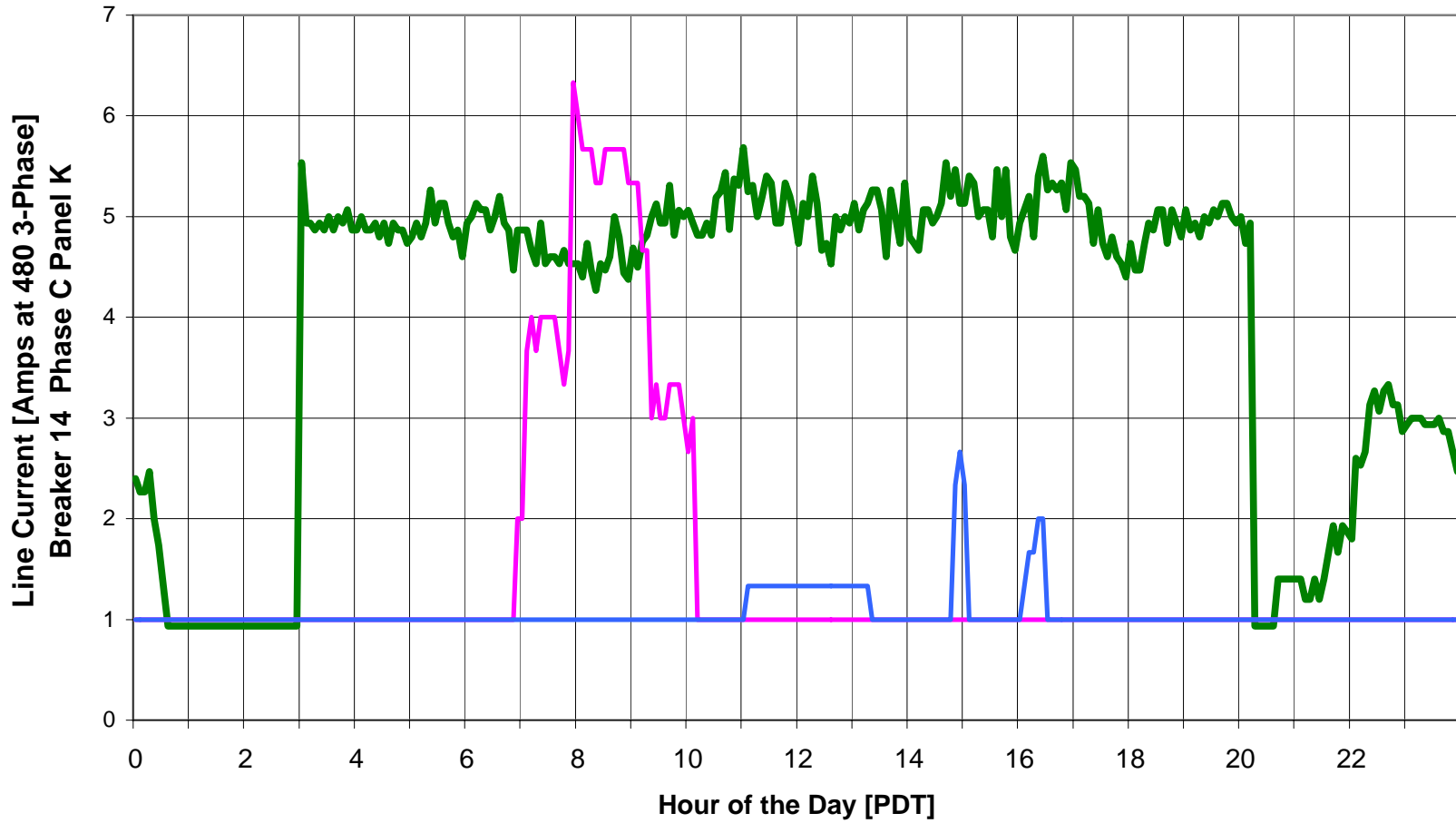
LA County Downey Admin. Building March 2004
Lighting Panel G
Average Daily Load Profile



LA County Downey Admin. Building April/May 2003
Lighting Panel K
Average Daily Load Profile

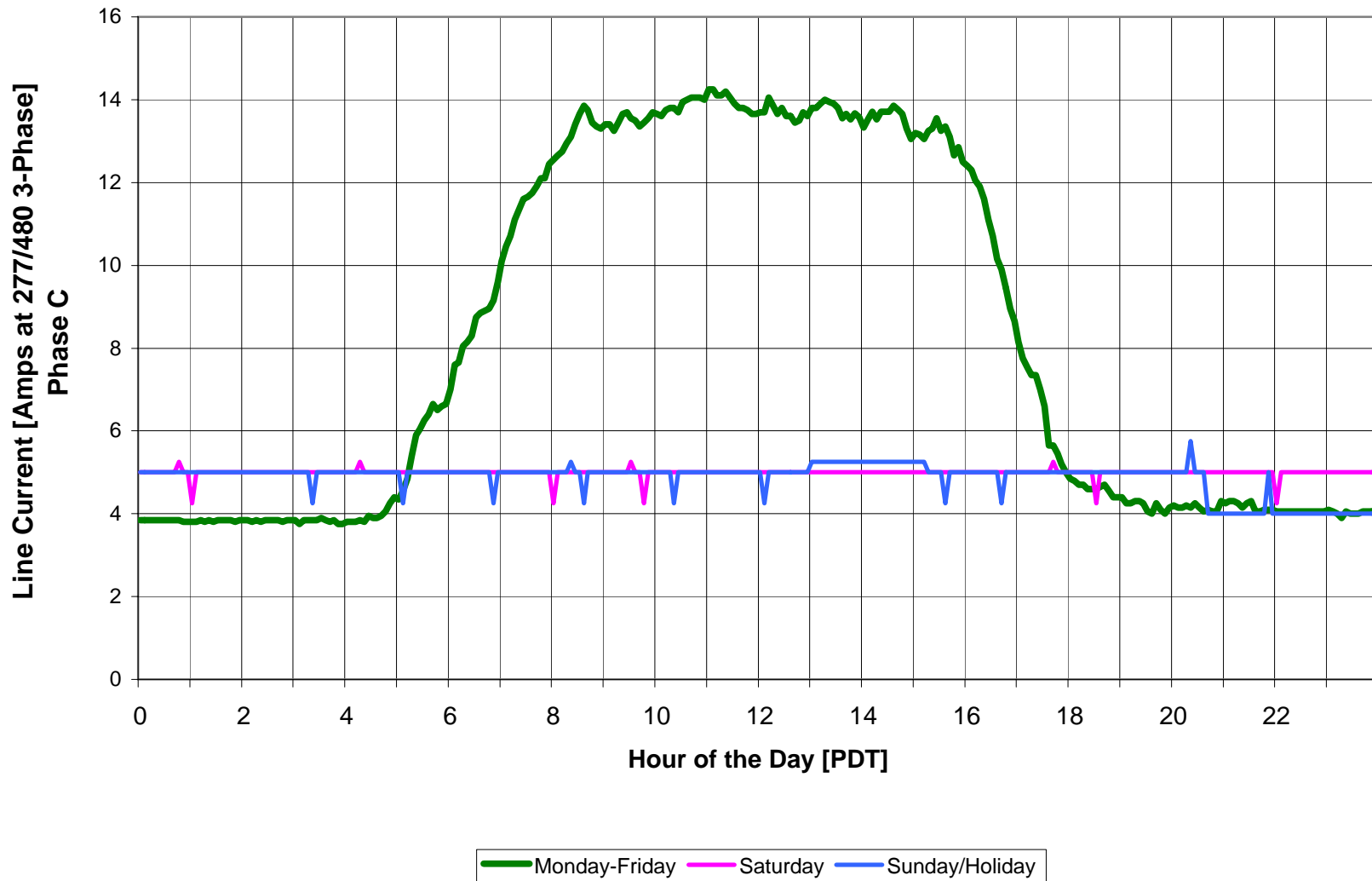


LA County Downey Admin. Building March 2004
Lighting Panel K
Average Daily Load Profile

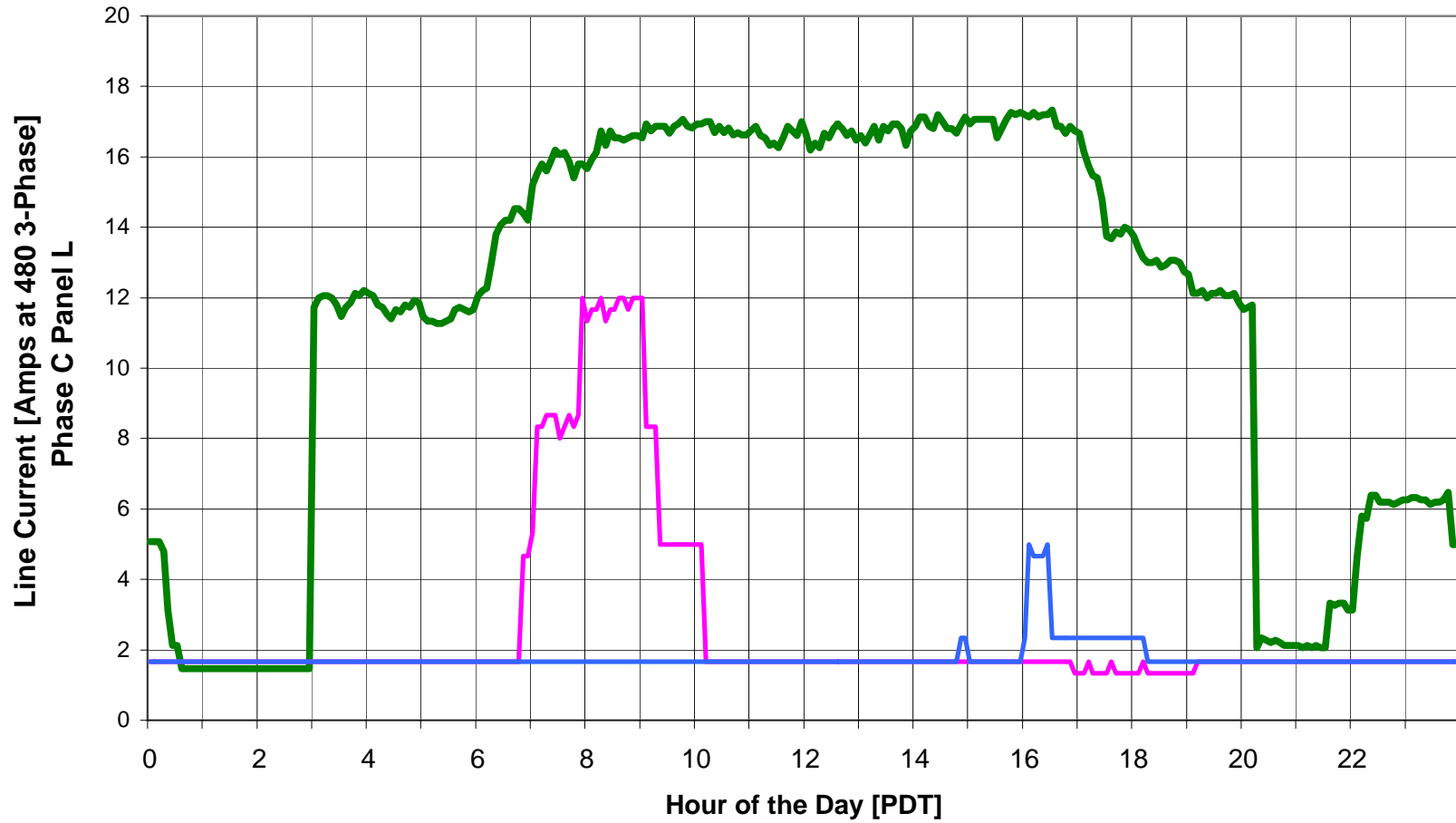


Monday-Friday Saturday Sunday/Holiday

LA County Downey Administration March/April 2003
Lighting Panel L, 4160 Vault NE
Average Daily Load Profile

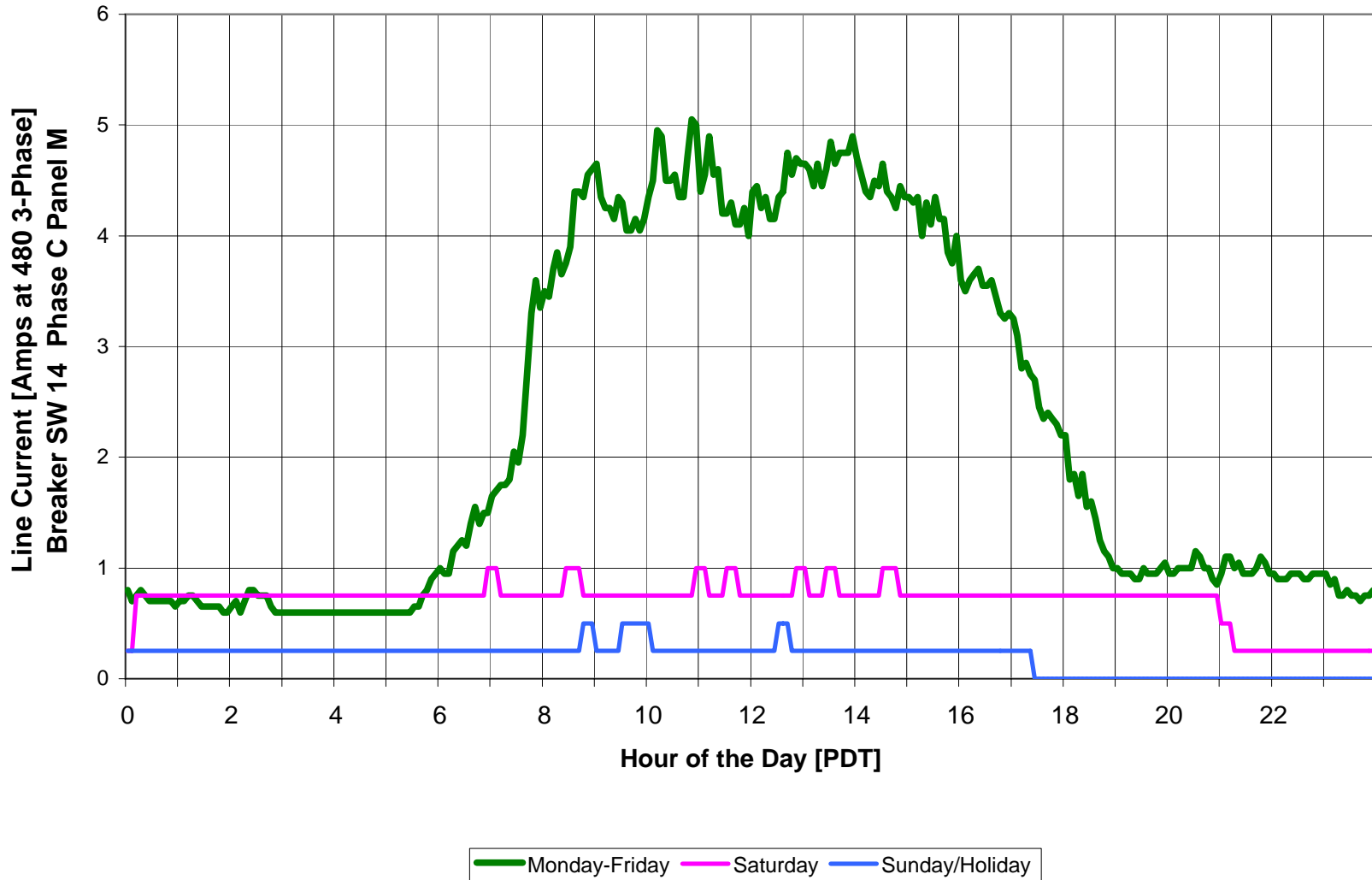


LA County Downey Admin. Building March 2004
Lighting Panel L
Average Daily Load Profile

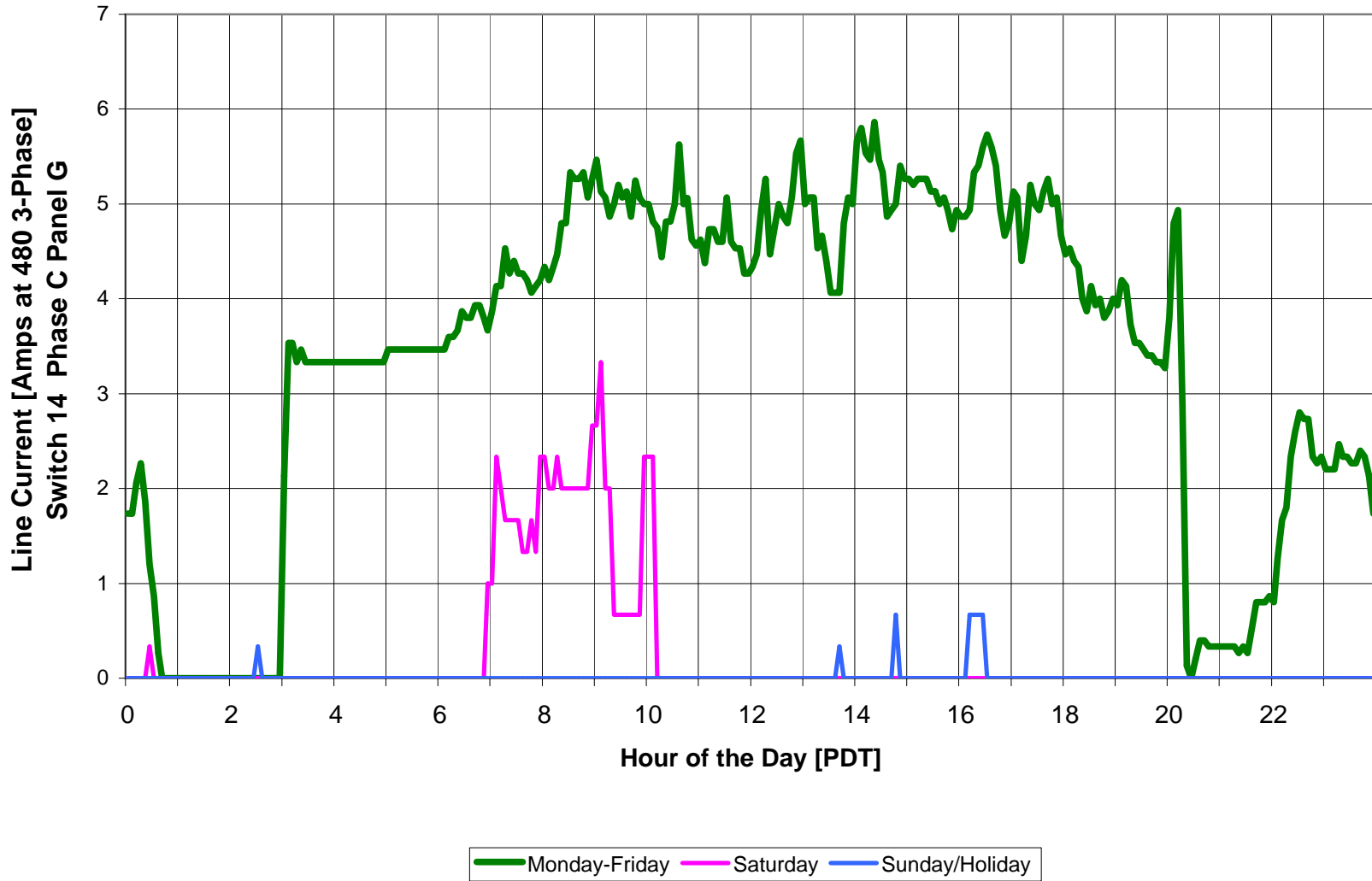


Monday-Friday Saturday Sunday/Holiday

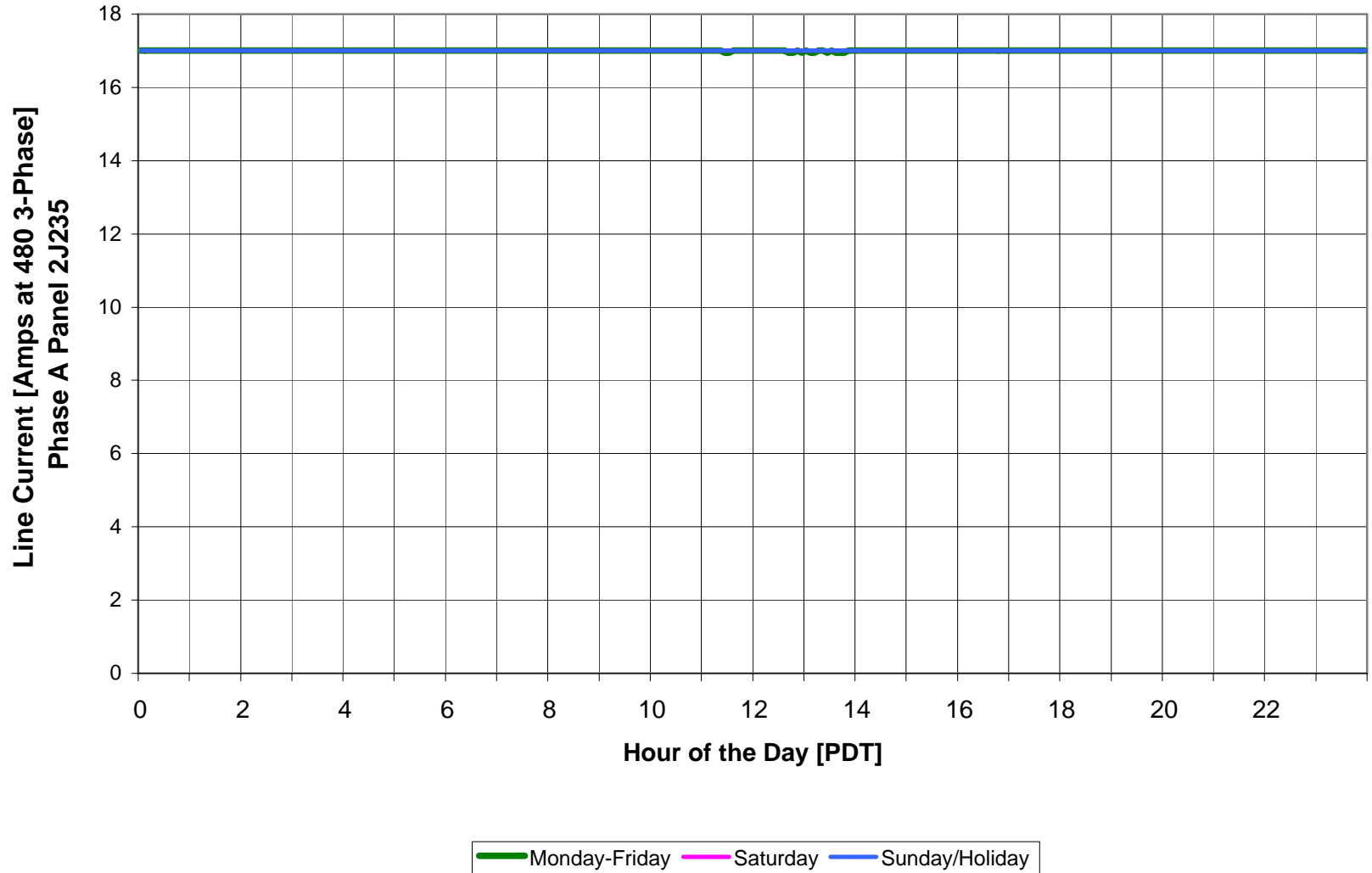
LA County Downey Admin. Building April/May 2003
Lighting Panel M
Average Daily Load Profile



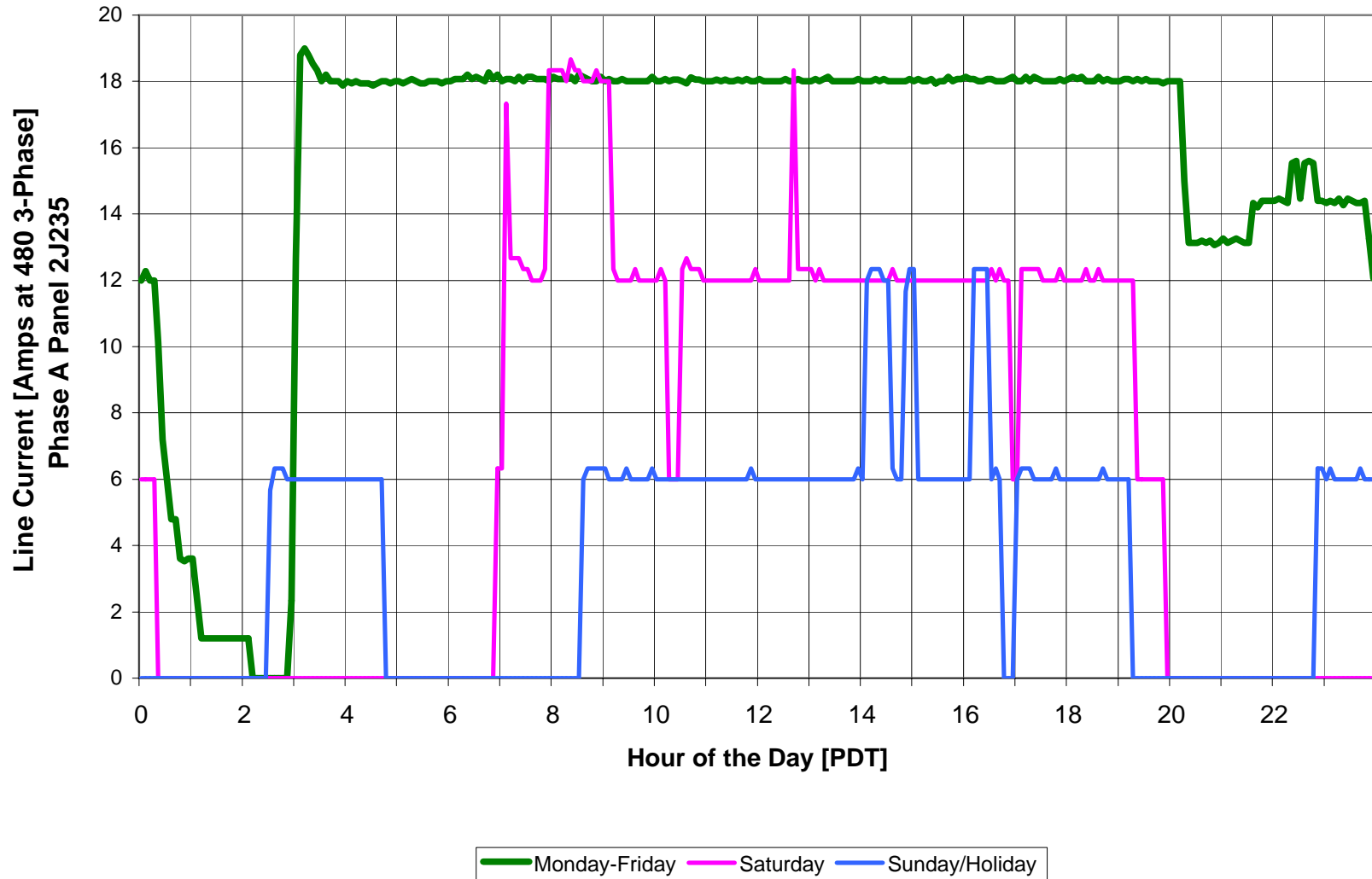
LA County Downey Admin. Building March 2004
Lighting Panel M
Average Daily Load Profile



LA County Downey Admin. Building April/May 2003
Lighting Panel 2J235
Average Daily Load Profile



LA County Downey Admin. Building March 2004
Lighting Panel 2J235
Average Daily Load Profile





LA County CPUC Local Program #156-02

Site 22 - Downey Admin Lighting

Main Breaker Feed to Panel K					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	5.20	1.13	1.36	0.75	0.83
B	19.88	5.50	5.58	0.97	0.99
C	5.75	0.57	1.44	1.33	0.44
TOT/AVG	10.28	7.20	8.38	3.05	0.75

Main Breaker Feed to Panel L					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	26.18	7.42	7.54	1.34	0.98
B	16.24	4.53	4.63	0.97	0.98
C	22.26	6.20	6.36	1.53	0.97
TOT/AVG	21.56	18.15	18.53	3.84	0.98

Main Breaker Feed to Panel M					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	3.74	1.03	1.08	0.34	0.95
B	10.48	2.96	2.99	0.45	0.99
C	6.72	1.88	1.93	0.41	0.98
TOT/AVG	6.98	5.87	6.00	1.20	0.97

Main Breaker Feed to Panel B					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	11.60	3.29	0.65	3.34	0.98
B	12.40	3.45	0.88	3.55	0.97
C	11.41	3.23	0.53	3.28	0.99
TOT/AVG	11.80	9.97	2.06	10.17	0.98



LA County CPUC Local Program #156-02

Site 22 - Downey Admin Lighting

Panel 2J235					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	21.31	5.91	1.46	6.09	0.97
B	20.49	5.68	1.43	5.86	0.97
C	18.41	5.08	1.20	5.22	0.97
TOT/AVG	20.07	16.67	4.09	17.17	0.97

Panel G					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	32.68	9.05	1.85	9.24	0.98
B	24.80	6.82	1.24	6.93	0.98
C	26.51	7.35	1.33	7.47	0.98
TOT/AVG	28.00	23.22	4.42	23.64	0.98

Panel E					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	2.30	0.57	0.14	0.59	0.95
B	3.54	1.00	0.23	1.02	0.98
C	3.08	0.86	0.18	0.88	0.98
TOT/AVG	2.97	2.43	0.55	2.49	0.97

Panel 2E235					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	20.56	5.74	1.47	5.93	0.97
B	24.15	6.68	1.71	6.90	0.97
C	18.10	5.03	1.38	5.22	0.96
TOT/AVG	20.94	17.45	4.56	18.05	0.97



LA County CPUC Local Program #156-02

Site 22 - Downey Admin Lighting

Panel F					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	32.94	9.09	1.73	9.26	0.98
B	29.29	8.01	1.50	8.15	0.98
C	26.54	7.34	1.35	7.47	0.98
TOT/AVG	29.59	24.44	4.58	24.88	0.98

Panel G69					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	8.57	2.46	0.59	2.52	0.97
B	6.59	1.87	0.51	1.94	0.97
C	11.72	3.39	0.81	3.49	0.97
TOT/AVG	8.96	7.72	1.91	7.95	0.97

Panel L1					
Phase	Current	Real P [kW]	S[kVA]	Q[kVAR]	Pwr Fctr
A	8.85	2.48	0.54	2.54	0.98
B	13.10	3.67	0.77	3.75	0.98
C	8.93	2.50	0.44	2.54	0.98
TOT/AVG	10.29	8.65	1.75	8.83	0.98



LA County CPUC Local Program #156-02

Site 22 - Downey Admin Lighting

480/277 V 3ph

Panel: Kitchen Panel N											
Measured Current [A]						Measured Current [A]					
No.	Size	Description	A	B	C	No.	Size	Description	A	B	C
1	20	Dining Lights	1.9			2		Blank			
3	20	Dining Lights		2.35		4		Blank			
5	20	Cafeteria Lights			1.11	6	20	New Office Lights			0.0
7	50	XFMR 3 Pole	12.8			8	20	Kitchen Lights	0		
9	50	XFMR 3 Pole				10	20	Kitchen Lights		0	
11	50	XFMR 3 Pole			12.88	12	20				0
13	20	Cafeteria Lights	0.2			14	20		0.0		
15	20	Snack Bar Lights		2.5		16	20			0.0	
17	20	Snack Bar Lights			3.4	18	20				3.2
19	20		2.6			20	15	W. A/C 3-Pole	1.8		
21	20	Snack Bar Lights		2.6		22	15	W. A/C 3-Pole		1.9	
23	20	Snack Bar Lights			2.6	24	15	W. A/C 3-Pole			1.9
25		Spare				26		Spare			
27		Spare				28		Spare			
29		Spare				30		Spare			
31	15	E. A/C 3-pole	4.2			32	15	Oven 3-pole	0.0		
33	15	E. A/C 3-pole		4.7		34	15	Oven 3-pole		0.4	
35	15	E. A/C 3-pole			4.9	36	15	Oven 3-pole			0.4
37	70	XFMR 3 Pole	8.3			38	20	Spare			
39	70	XFMR 3 Pole				40	20	Spare			
41	70	XFMR 3 Pole			8.2	42	20	New Office Lights			6.57
43	15	3phase breaker	0.2			44			7.07		
45	15			0.2		46				5.53	
47	15				0.2	48		Spare			
		Total	30.2	12.4	33.3			Total	8.9	7.9	12.1
		Panel Total	39.1	20.3	45.4						
		Average Line Current		34.887							

ISD Downey Administration - 9150 E. Imperial Highway



Downey Administration Building Front



2nd Floor Open Area Light Fixtures



Downstairs Open Area Fixtures Near Panel F



Old Lighting Breaker Panel 2J235 Upstairs



New Lighting Breaker Panel 2J235 Upstairs

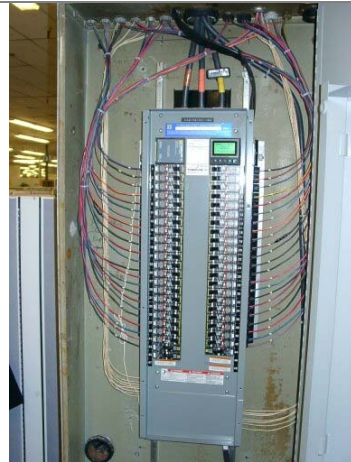


New Lighting Breaker Panel E

ISD Downey Administration - 9150 E. Imperial Highway



New Lighting Breaker Panel F



Lighting Breaker Panel G With Datalogger



New Lighting Breaker Panel G-69



New Lighting Breaker Panel L-1



Datalogger On Breaker For Panel L



New Lighting Breaker Panel 2E235

ISD Downey Administration - 9150 E. Imperial Highway



New Lighting Breaker Panel N



New Lighting Breaker Panel N Legend



4160 Vault PP4 Panel With Dataloggers

Site Measurement and Verification Report

Site Number 23

ISD Eastern Ave Lighting Controls

**1100, 1102, 1104, and 1110 N. Eastern Ave., Los Angeles
SCE Account 3-011-6255-30**

Annual Energy Savings Estimates from Lighting Controls	
Building Area	559,198 ft ²
LA County Estimate at 1.31 kWh/ft ²	733,301 kWh
<i>Ex-Ante</i> Evaluation	733,301 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	28,191 kWh
Potential <i>Ex-Post</i> Savings	197,936 kWh

Site Description

The ISD Eastern Avenue Complex includes four different buildings. The first building, 1100 Eastern Avenue represents ISD headquarters. This building is mainly offices including the energy management division. The second building, 1102 Eastern Avenue represents the ISD Complex Crafts workshop. This area is made up of large open work areas, offices and material storage areas. It is a single-story, warehouse style building used for a variety of trades and crafts personnel for the County of Los Angeles. Differing trades such as the welding department divide the building. It also contains a main warehouse that receives and stores materials such as plumbing supplies on racks out in the main warehouse area. The third building, 1104 Eastern Avenue represents the ISD Auto Repair Shop. The Auto Repair Shop is a garage where they repair police and other L.A. County vehicles. The fourth location, 1110 Eastern Avenue is a warehouse.

Controls Locations

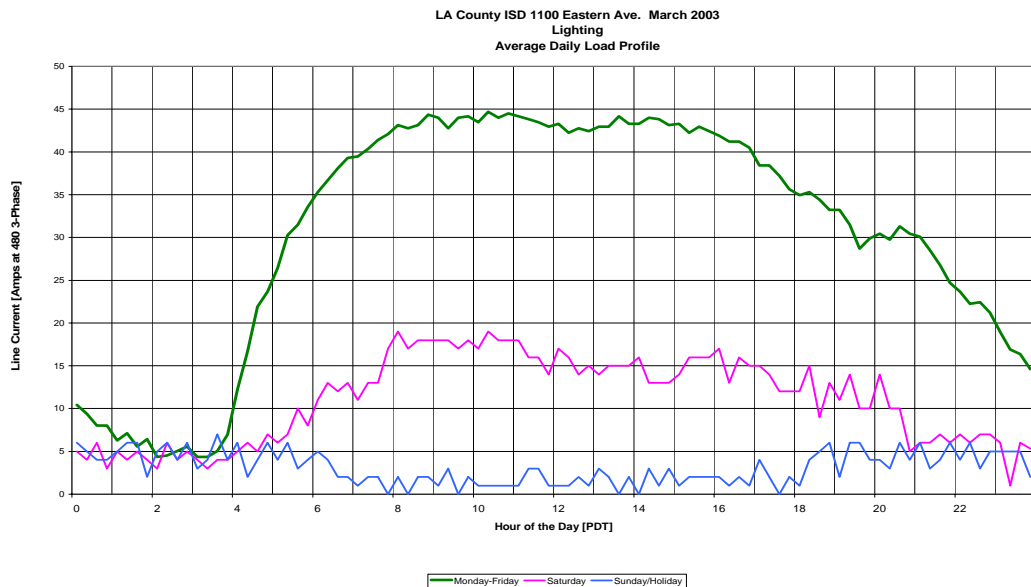
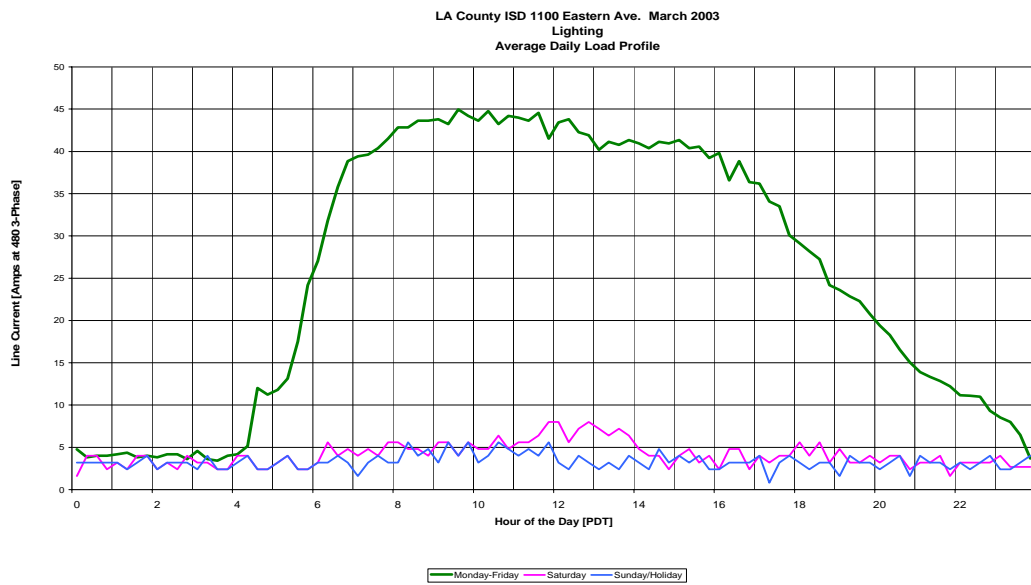
A total of thirty new control units were installed on the lighting panels as part of the energy efficiency program. All of the old panels were replaced with new Square D panels, in which individual circuit breakers can be controlled or not controlled. Six new panels were installed at 1100 Eastern Avenue, six new panels at 1102 Eastern Avenue, seventeen new panels at 1104 Eastern Avenue, and one new panel at 1110 Eastern Avenue.

Metered Load Profiles

Los Angeles County has an energy management system with internet connection. The ISD Eastern Avenue complex is the most completely monitored location within the county. We were given Internet access to the system and were able to download submetered interval data for specific lighting panels in the 1100 and 1102 buildings. (The 1104 and 1110 buildings are presently metered only at their mains.) These data were used in conjunction with metered lighting operation data gathered for the lighting system retrofits at 1102, 1104, and 1110 Eastern Avenue (see Site Chapter 26).

1100 ISD Main Building:

The energy management system in this building collects extensive data on individual subpanels at the 480-volt level. Chiller, lighting, and 120/208-volt loads are monitored separately. We analyzed the 15-minute interval lighting panel usage from January 1, 2003 until the present. The control panels were installed on October 31, 2003, so we chose January through April of 2003 and 2004 for our comparison. No lighting fixture changes were made, so the kWh difference represents only the effects of the control system. During the first four months of 2003 the lighting system used 52,356 kWh. During the same period of 2004 the system used 57,207 kWh. This means the lights used 4,851 kWh *more* after the controls were installed. Assuming these four months represent the year, this equates to an annual energy savings of -14,553 kWh per year. The following load profiles represent March of 2003 and 2004.



1102 Crafts Building:

The control system was installed in this building on March 17, 2004. Lighting retrofits also converted 100 kW of metal halide fixtures to 58 kW of T-5 fluorescent fixtures. We thus used operating hours analysis to separate the savings attributed to the fixture retrofit (discussed in Site Chapter 26 following) and the control system. Before the installation of the control system, meters had been installed to analyze the fixture retrofit. The average operating time estimated for this building was 3,211 hours per year.

We analyzed the lighting load data from April 1 through May 12, 2004. Some data points were missing, which made developing accurate graphic load profiles difficult. However, we were able to determine that the lights consumed 22,770 kWh during the 910.75 hours of this period for which data points were available. The data also validated the 56 kW lighting calculated in the lighting retrofit analysis. We extrapolated annual full-load operating hours to be 3,925. This amounts to an annual energy consumption of 219,012 kWh. These same lights would have consumed 179,058 kWh/yr by operating at the 3,211 h/yr rate that we had calculated before the control system was installed. The means the control system produced excess usage of 39,954 kWh per year.

1104 Automotive and 1110 Warehouse Building:

We do not have both pre- and post-control-system operating hours for these two buildings. The 1110 control system was installed on January 15, 2004, and the 1104 system was not installed until March 30, 2004. In 1110 our dataloggers recorded post-installation operating times and in 1104 they recorded pre-installation operating times. The county's energy management system does not submeter these loads below the building main.

Average operating time at the 1104 automotive shop was 4,933 h/yr in the paint shop and 3,571 in the main garage. In the 1110 warehouse, the operating time was 2,951 h/yr. These buildings are not directly comparable. However, the difference between the pre-control automotive shop hours and the post-control warehouse hours indicate that reduced operating times in all these areas are at least achievable (rather than the negative reduction shown in the main building and the crafts shop).

The automotive shop load is 128 kW in the 3571-hour area and 41 kW in the 4933-hour area. The warehouse load is 7.7 kW. Assuming the automotive shop areas were able to be reduced to 2,951 hours per year, and the warehouse had operated at 3,571 hours per year, these control systems would save 165,396 kWh per year. This estimate is based on several unproven and probably excessive assumptions, particularly since the other two buildings demonstrated increased operation. We believe actual savings are probably closer to half of this amount, or 82,698 kWh per year.

Potential Savings

The planned schedule for the lights in these facilities is from 6:00 a.m. until 7:15 p.m. Monday through Thursday. ISD is closed on Friday. This amounts to 2,650 hours per year. Override systems are available for people working past these hours.

The following table compares the operating hours measured or estimated at the four buildings:

ISD Complex Lighting Operating Hours				
Building	Load kW	Pre-Install	Post-Install	Proposed
1100 Main Building	52	3200	3930	2650
1102 Crafts Shop	56	3211	3924	2650
1104 Automotive	128	3571		2650
1104 Auto Paint	41	4933		2650
1110 Warehouse	8		2951	2650

The 2,650 h/yr value represents an ideal situation, in which the lights are fully shut off at 7:15 p.m. (after giving a flash signal at 7:00 p.m. to signal employees to enable overrides). It is not intended to be a fully achievable scenario, because it is known that Friday and Saturday work is common and that evening cleaning and other work can increase usage.

The 2,951 h/yr value monitored in the warehouse demonstrates the activity of a controlled system in which the controls appear to working well. We will use this value as an achievable full-load equivalent operating time for the entire facility, although we suspect that it may not be achievable in all locations.

Energy Savings Calculations

The following table shows the estimated present energy savings of the system as well as the savings we consider achievable through more aggressive programming of the controls.

ISD Eastern Avenue Complex Lighting Control Systems Annual kWh Savings		
Building	Present Savings	Potential Savings
1100 Main Building	- 14,553	18,148
1102 Crafts Shop	- 39,954	14,392
1104 & 1110 Auto/Warehouse	82,698	165,396
Total	28,191	197,936

The proposal measure unit for building controls was square feet of building area, with a total savings estimate of 1.31134 kWh/yr-ft². The buildings total 559,198 ft². We verified that lighting controls were installed to effectively control the lights throughout

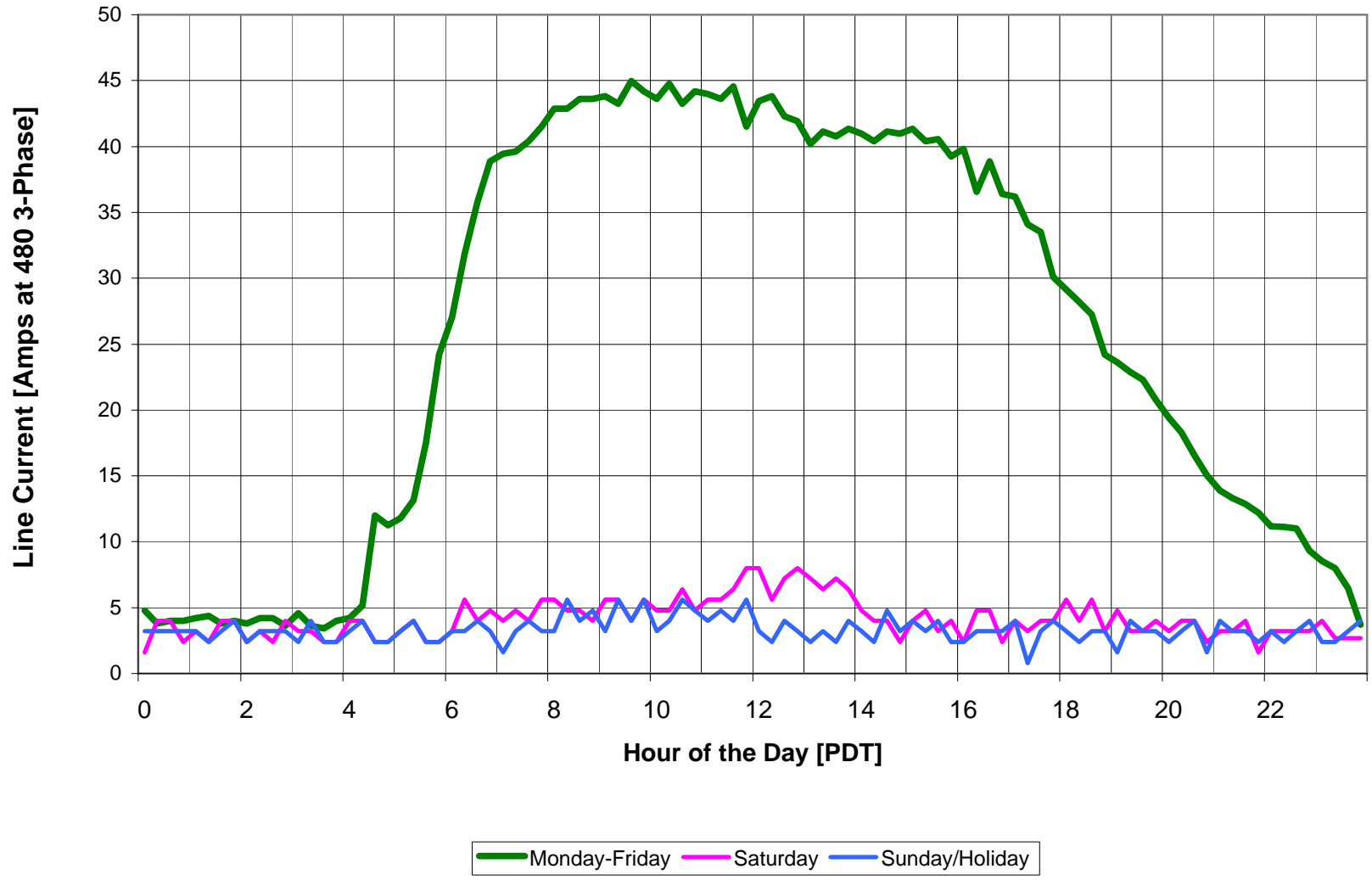
the entire building. Thus the *ex-ante* savings estimate is 733,301 kWh per year, which is the same as the county's estimated savings for this site.

The total *ex-post* evaluation of savings for these control systems is 28,191 kWh per year as operating at the time of our metering. However, we are aware that the system had been installed late in the program period and that it was not fully commissioned during our metering period (which had to be completed in order to prepare this report in a timely manner).

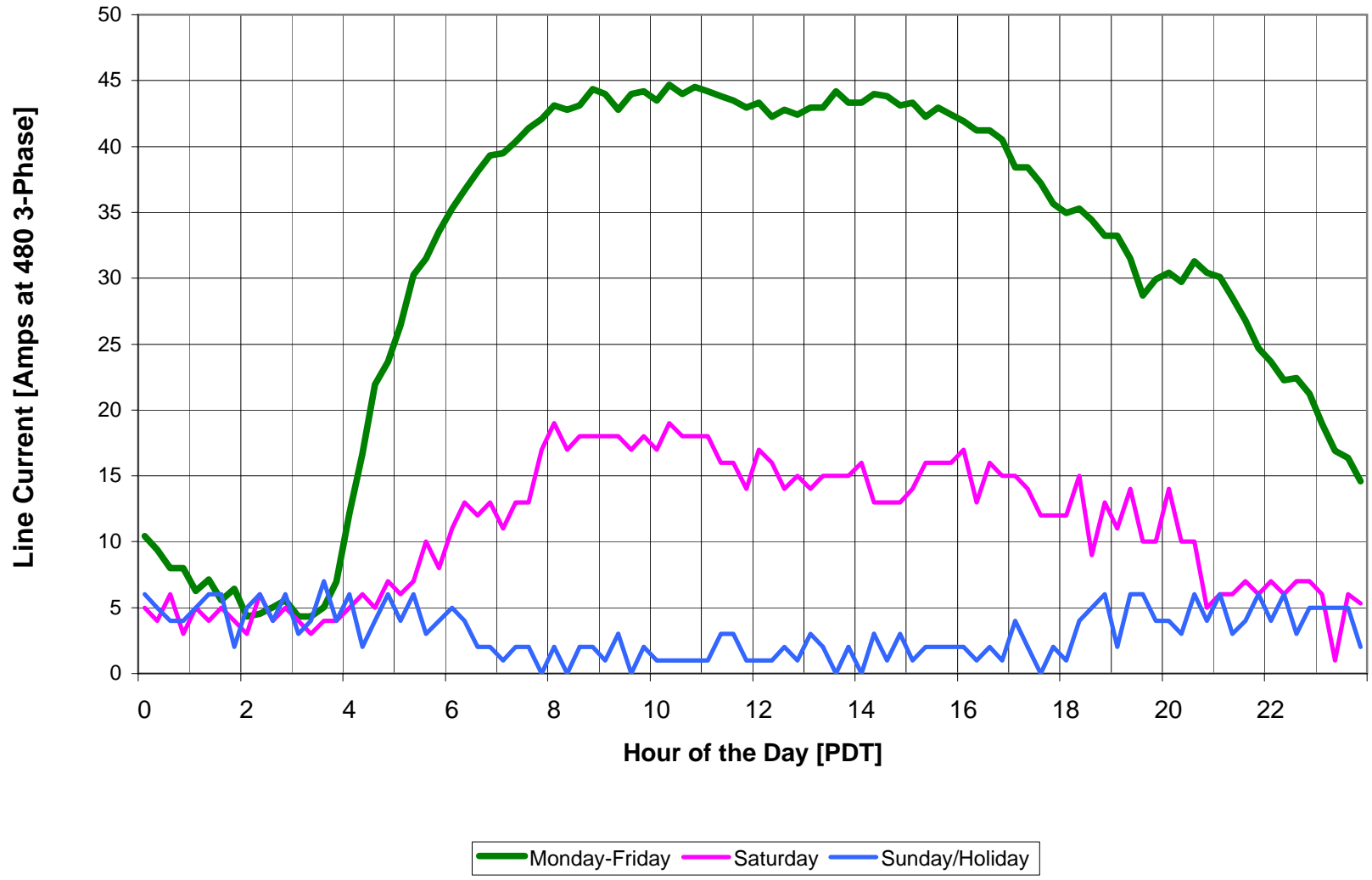
If the control system is optimized as described above, we estimate that total savings of 197,936 kWh/year would be achieved, which is a "potential *ex-post*" energy savings. We anticipate that the actual operating savings achieved will be between the present number (28,191) and the potential (197,936), and that the originally proposed value (733,301) is not possible.

We also emphasize that the failure of this control system to achieve the desired savings is *not* because the new system does not work, but rather because the system existing prior to the retrofit worked adequately.

LA County ISD 1100 Eastern Ave. March 2003
Lighting
Average Daily Load Profile



LA County ISD 1100 Eastern Ave. March 2004
Lighting
Average Daily Load Profile



Site Measurement and Verification Report

Site Number 24
Sheriff's STAR Center
11515 Colima Rd., Whittier
SCE Account 3-011-9860-40

Annual Energy Savings Estimates	
Building Area	273,821 ft ²
LA County Estimate at 1.31 kWh/ft ²	359,074 kWh
Ex-Ante Evaluation	359,074 kWh
Aloha Ex-Post Measured Evaluation	32,241 kWh
Potential <i>Ex-Post</i> Savings	49,524 kWh

Site Description

The Sheriff's Training Academy Regional Service (STAR) Center is a campus of several single-story buildings that house offices, classrooms, meeting rooms, break rooms and a gymnasium. (It is a converted school facility.) The site is used as a training facility and for offices of the various sheriff departments, including the bomb squad, arson unit, cyber crimes, undercover, etc. There is also a police museum on campus. Southern California Edison supplies the facility at 480Y/277 volts through meter V349E-004564.

The lighting control setup on all of the panels is set to turn on lights between 5:45 a.m. and 7:00 a.m. and turn off the lights between 5:30 p.m. and 11:30 p.m. depending on the zone. There is an override button available to staff that allows the system to be overridden to be on for an additional two hours before turning the lights off.

Controls Locations

A total of twelve new control units were installed on the lighting panels as part of the energy efficiency program. All of the old panels were replaced with new Square D panels. The Square D panels are model NF2000G3 and can control each individual breaker in the entire lighting panel.

Preliminary Site Visit

The site was visited on May 13, 2003. During the visit power measurements were taken and dataloggers were installed in panels EH, FH, IH, and MH. The rest of the lighting panels' part of the controls project was not monitored by a datalogger. Dataloggers were installed to provide a "pre-controls" load profile. These load profiles document the operation of each panel before the installation of the new panels and control systems. Dataloggers were installed on individual circuits known to be lighting loads.

Post-Retrofit Audit

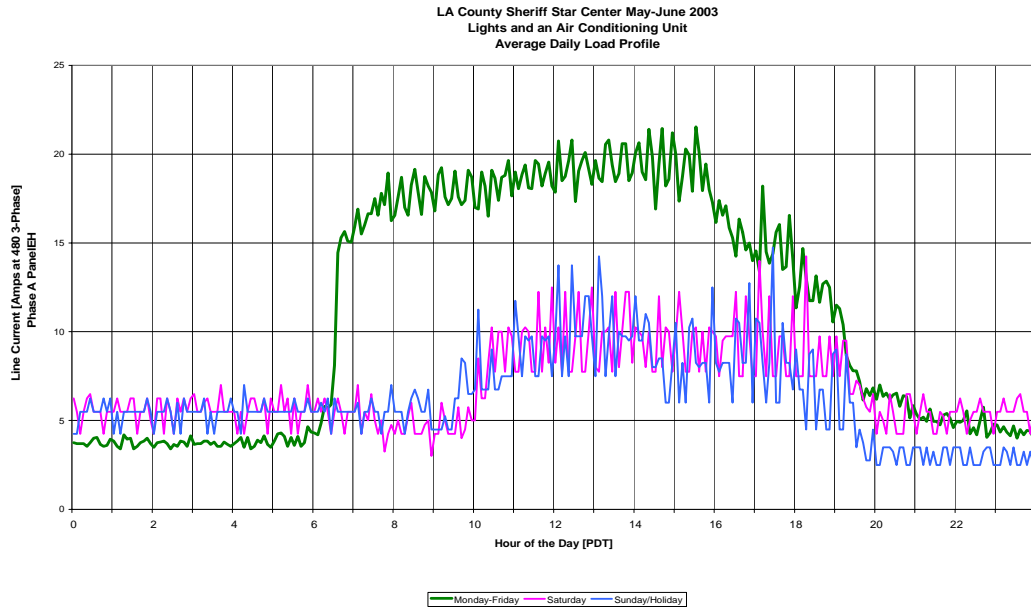
The site was again visited on March 17, 2004. We took power measurements at each individual panel for all twelve lighting panels that are part of the controls project. We installed dataloggers for the same four lighting panels.

Metered Load Profiles

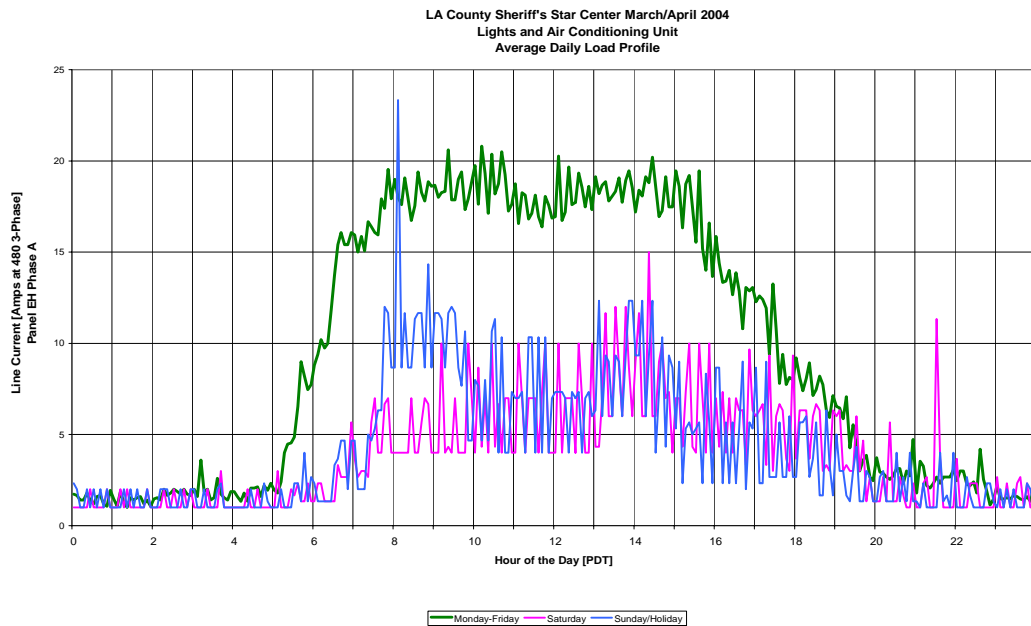
This site is divided into 33 zones. Most of the zones have their lights turned on from 5:45 a.m. to 8:00 p.m. Monday through Friday. There are a few zones that operated Monday through Saturday. We collected interval data for lighting loads in four lighting panels. To the extent possible we metered the same phase of the same panel, thus assuring the comparative aspect of the pre- and post-installation data. We used different dataloggers of the same brand and size for the four lighting panels because the original dataloggers were not available. The remaining eight lighting panels did not have a datalogger installed, so no directly-metered load profile is available for those panels. Panels BH, DH, FH, KH, and LA also had some loads that were not being controlled such as a water heater, transformer, or plug loads to name a few. To get an accurate power draw from these panels we calculated the power draw of the loads that are not being controlled and subtracted the number from the power drawn from the whole panel. This gives an adjusted power draw that only represents lights that are being controlled.

Panel EH: This lighting panel controls lights in zone 14 and 15 which is lights in Building E. The recorded power draw of the lights is 11.23 kW. The full-load operating time before installation was 4,495 hours per year. The post-installation equivalent operating time was 3,799 h/yr, indicating the system decreased operating time by 696 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will decrease by 932 hours to 3563 hours per year.

Pre-Installation

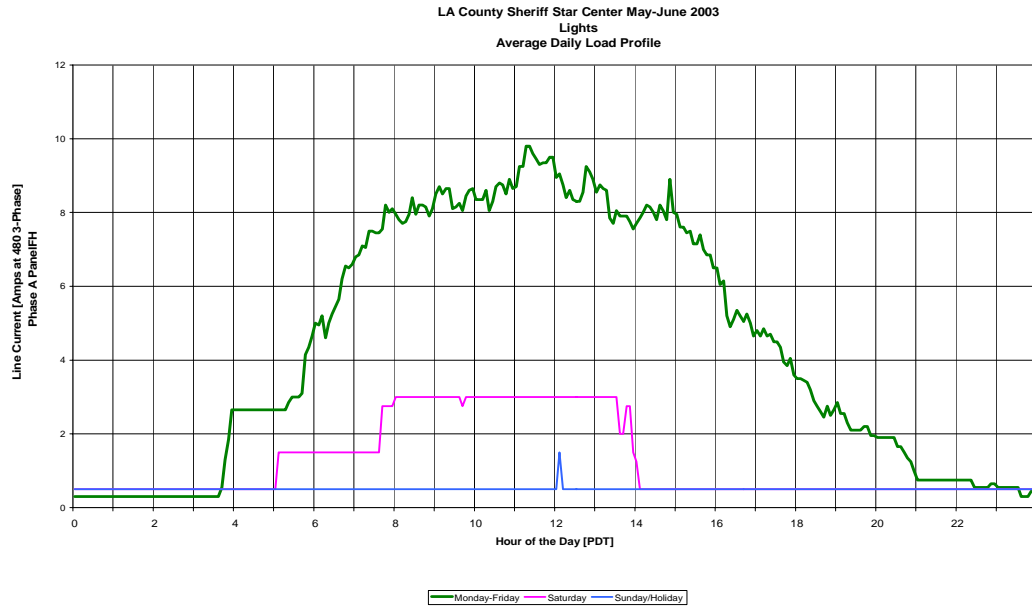


Post-Installation

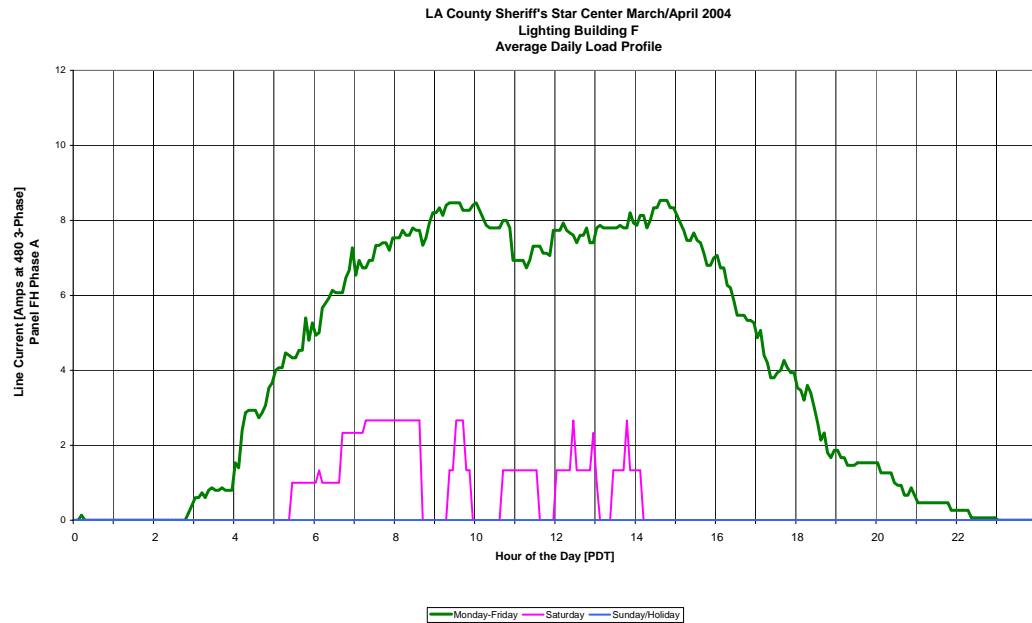


Panel FH: This lighting panel controls lights in zone 20-24 which are lights in building F. This panel is not controlling breakers 20-24. The recorded power draw of the panel was 12.02 kW. The power draw of the lights after adjusting for non-controlled loads is 4.15 kW. The pre-installation equivalent operating time of the lights is 2,963 hours per year. The post-installation equivalent operating time was 2,199 h/yr, indicating the system decreased operating time by 764 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will increase by 600 hours to 3563 hours per year.

Pre-Installation

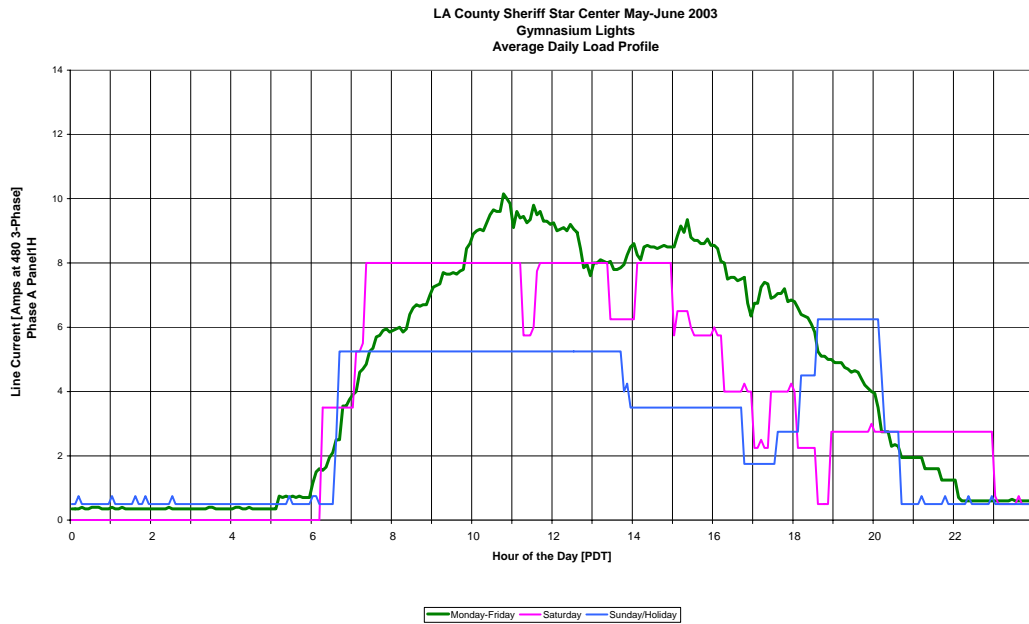


Post Installation

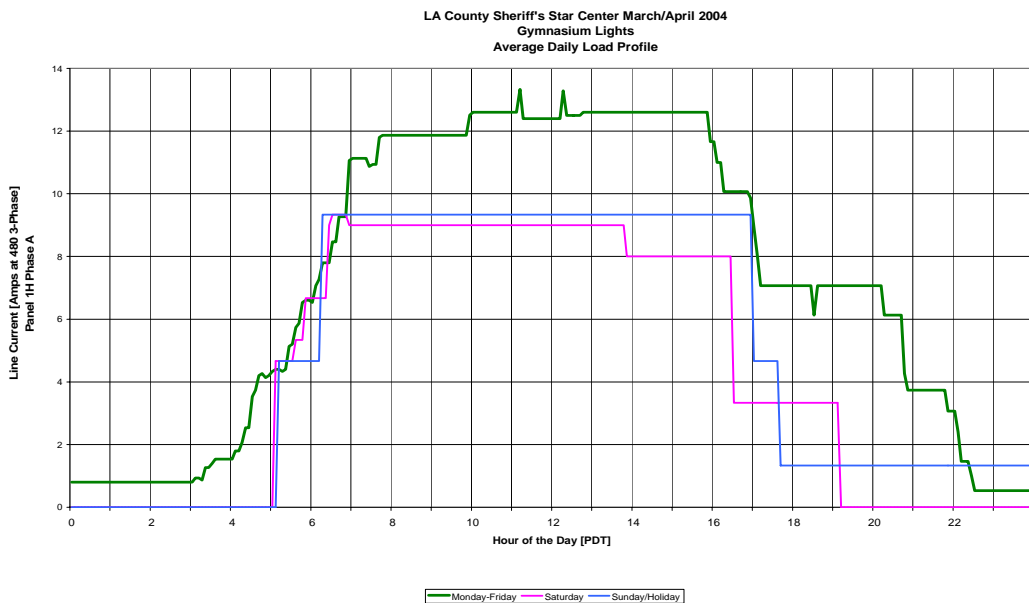


Panel IH: This lighting panel controls lights in the gymnasium. Breaker #10 is not being controlled on this lighting panel. The recorded power draw of the lights on this panel was 11.01 kW. The equivalent full-load operating time before installation was 2,691 hours per year. The post-installation equivalent operating time was 4,020 h/yr, indicating the system increased operating time by 1,329 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will increase by 2,292 hours to 4983 hours per year.

Pre-Installation

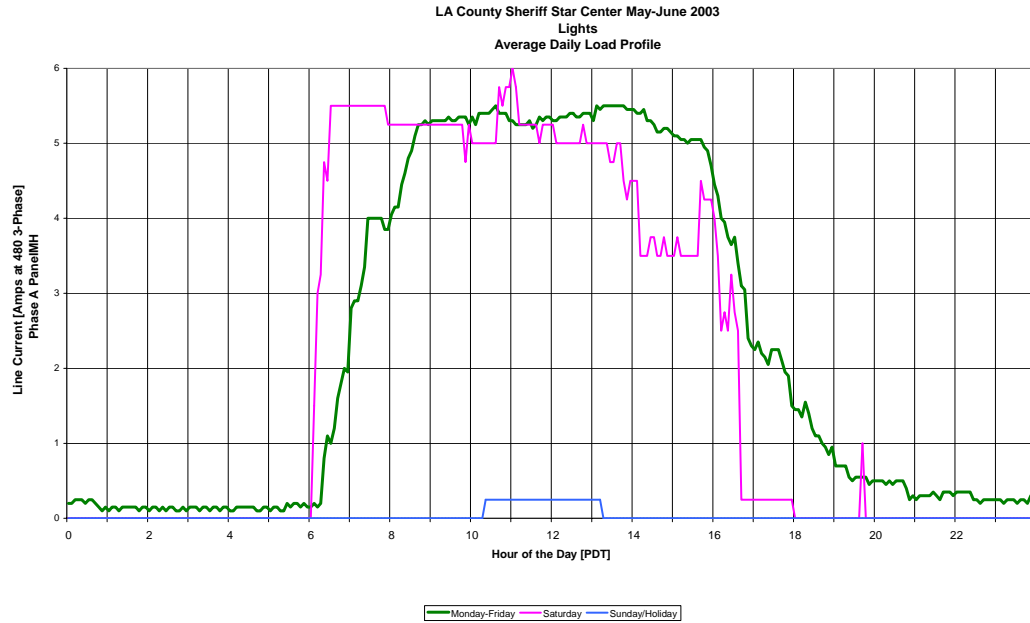


Post-Installation

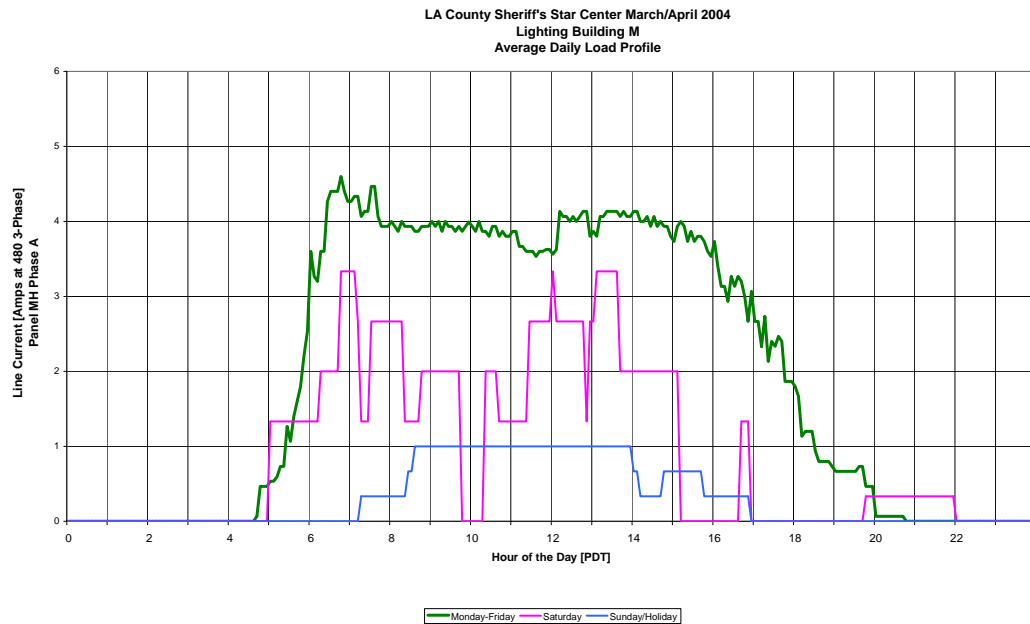


Panel MH: This lighting panel controls lights in various rooms in building M. The recorded power draw of the lights is 5.14 kW. The equivalent full-load operating time before installation was 2,788 hours per year. The post-installation equivalent operating time was 2,268 h/yr, indicating the system decreased operating time by 520 hours per year. If the controls are fully programmed and operate as proposed the operating time of the lights will increase by 775 hours to 3563 hours per year.

Pre-Installation



Post-Installation



Non-Monitored Panels

Eight of the panels were not monitored with interval dataloggers because they controlled lights in areas similar to those for which we created load profiles.

Buildings E and M contains offices. Buildings A, B, C, and D also contain offices for different sections of the Sheriff's Department. **Panel AH** controls lights in building A; it had a power demand of 8.24 kW. **Panel BH** controls lights in building B; it had a power demand of 7.81 kW. **Panel CH** had a power demand of 9.98 kW. **Panel DH** had a lighting power demand of 9.31 kW. These panels were assigned pre- and post-installation operating hours representing the average of Panel EH and Panel MH, that being 3642 h/yr pre-install, 3034 h/yr post-install, and 608 hours per year reduction in operating time.

Building F contains classrooms, a few offices, and some other training areas. Building H contains the cafeteria, a classroom, and the amphitheater, though the theater lights are not part of the control system. Building K contains classrooms. Building L is a portable building containing a classroom, the weight room, and the media resources facility. **Panel HH** only had five breakers with a very small load and a power demand of 0.56 kW. **Panel HHA** has only three breakers and a power demand of 3.00 kW. **Panel KH** had a lighting power demand of 3.88 kW. **Panel LA** located in a trailer is mixed with plug loads; the lighting power demand was 7.91 kW. These panels were assigned the same pre- and post-installation operating hours as Panel FH.

Energy Savings Calculations

The table on the following page delineates the savings at this site for each of the lighting panels included in the project. The annual savings is the full-load demand (kW) multiplied by the change in equivalent full-load operating hours as determined by comparing the pre- and post-control load profiles for the same locations. Negative numbers indicate increased operation after the controls were installed and result in increased energy consumption on these panels. Numbers shown in green represent values that were derived from other panels' load profiles.

Sheriff Star Center Lighting Control Systems Annual kWh Savings					
Panel Name	Measured kW	Pre-Control Hours	Post-Control Hours	Operating Hour Reduction	kWh Saved
Panel AH	8.24	3642	3034	608	5,010
Panel BH	7.81	3642	3034	608	4,748
Panel CH	9.98	3642	3034	608	6,068
Panel DH	9.31	3642	3034	608	5,660
Panel EH	11.23	4495	3799	696	7,816
Panel FH	4.15	2963	2199	764	3,171
Panel HH	0.56	2963	2199	764	428
Panel HHA	3.00	2963	2199	764	2,292
Panel IH	11.01	2691	4020	-1329	-14,632
Panel KH	3.88	2963	2199	764	2,964
Panel MH	5.14	2788	2268	520	2,673
Panel LA	7.91	2963	2199	764	6,043
Total/Avg	82.22	3280	2768	512	32,241

The control systems were installed late in the program and had not necessarily been implemented to their full or planned capability at the time of our post-installation data collection. However, the metered data demonstrate that most of these control systems are saving energy and that the “average” light is operating less than the planned operating time for the control system (3563 h/yr). This is primarily because the classroom and office lights can be controlled both by local switches and by the system, requiring both to be “on” in order the light to operate.

Unlike some other sites, striving for the intended operating time is clearly not a desirable goal at the STAR Center. We do believe, however, that this goal might be achievable in Building E, reducing its present operating time of 3799 h/yr by an additional 236 h/yr to reach 3563. This would save an additional 2,650 kWh/yr in savings on Panel EH.

We also believe that the system should be tunable so that the gym lights do not operate longer periods than they had prior to installation of the system. (It is also possible that gym usage was simply different during the pre- and post-installation monitoring periods.) In either of these cases, the increased usage on Panel IH should be able to be eliminated, bringing the panel's savings from -14,632 up to zero.

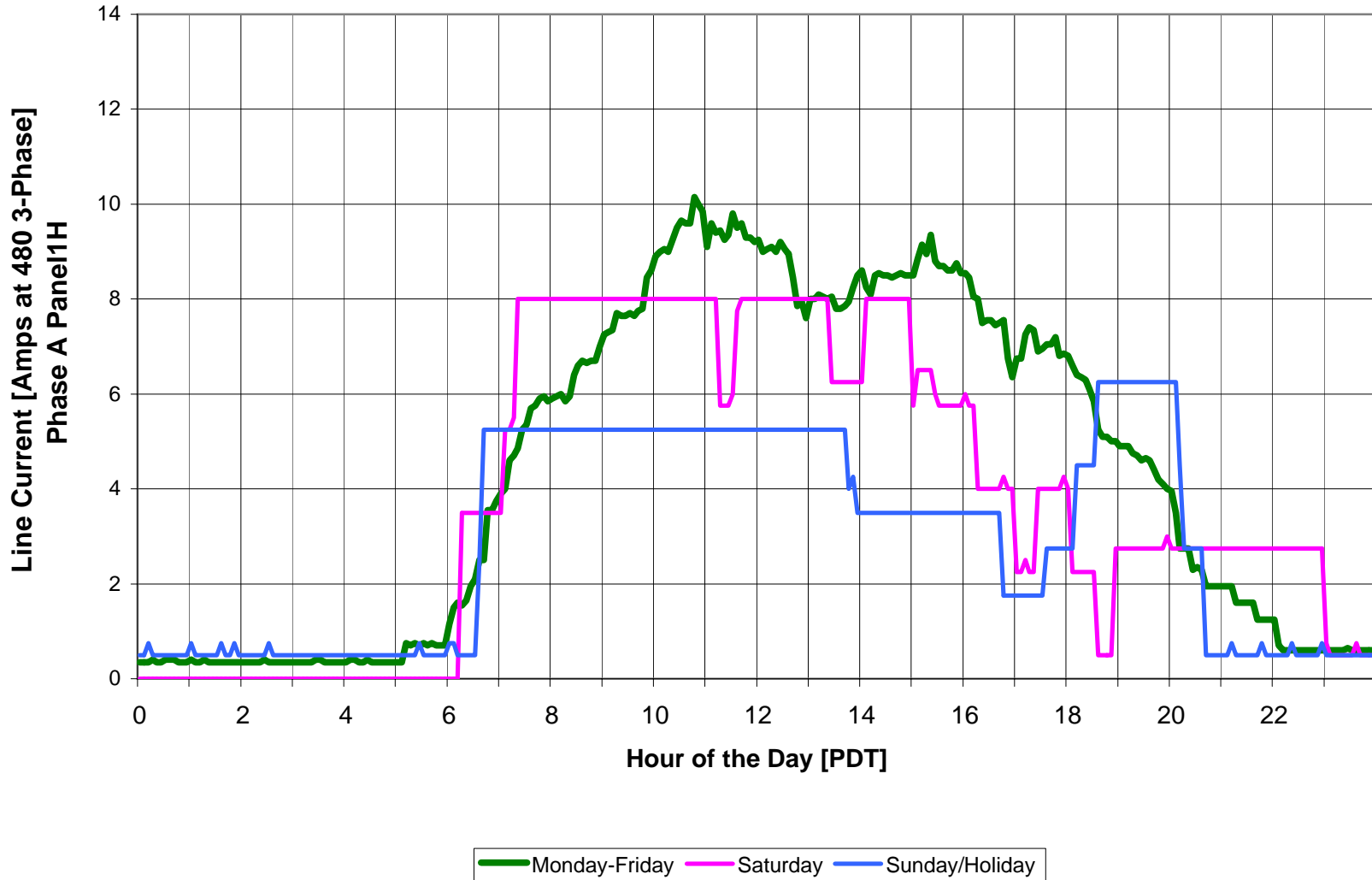
These two optimization efforts will increase the system's savings at this site by 17,282 kWh/year, bringing the total up to 49,524 kWh/yr.

The proposal measure unit for building controls was square feet of building area, with a total savings estimate of 1.31134 kWh/yr-ft². The Sheriff Star Center is 273,821 ft². We verified that lighting controls were installed to effectively control the lights throughout the entire site. Thus the *ex-ante* savings estimate is 359,074 kWh per year, which is the same as the county's estimated savings for this site.

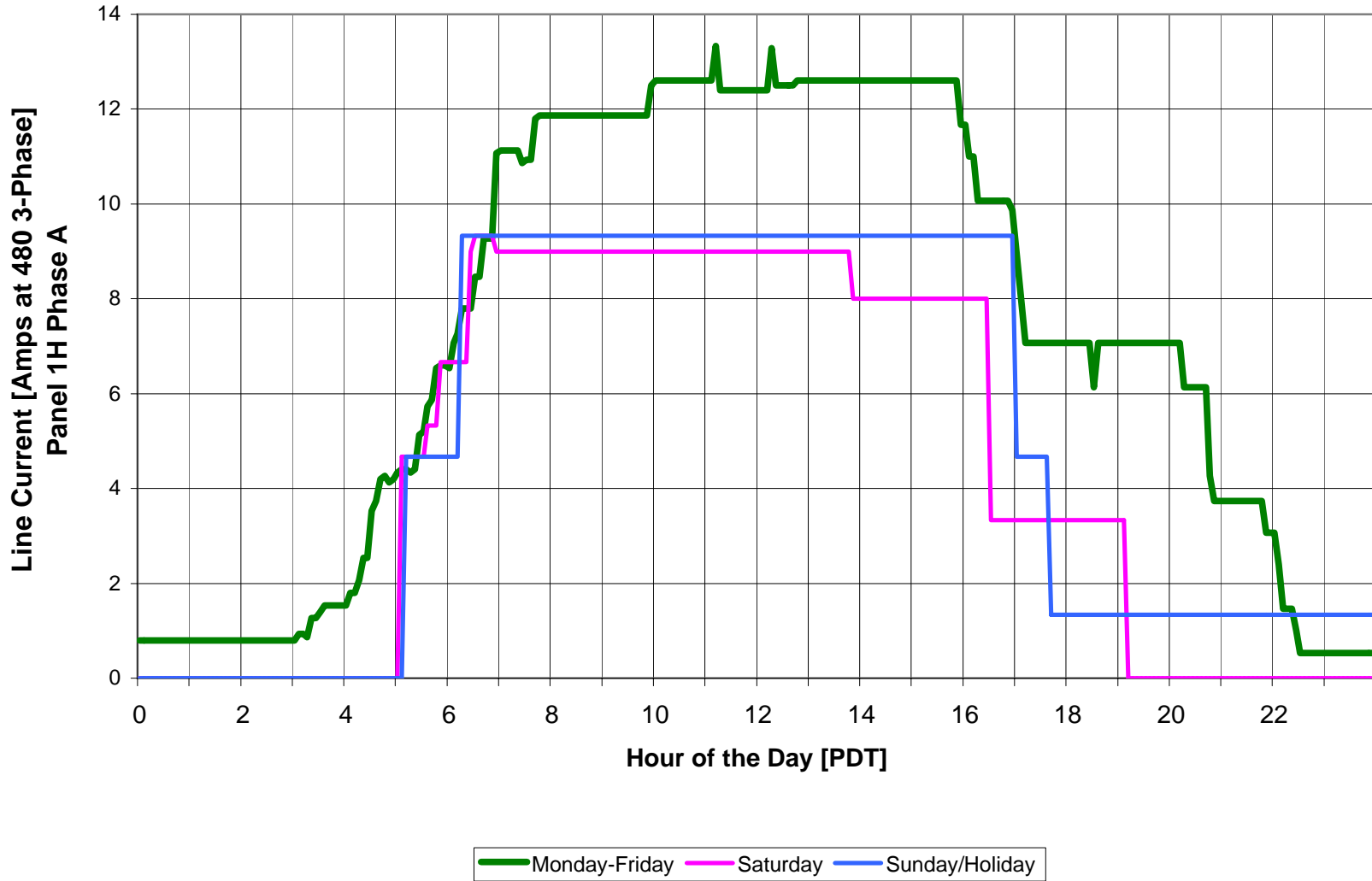
The total *ex-post* evaluation of savings for these control systems is 32,241 kWh per year as operating at the time of our metering. However, if the control system is optimized as described above, the total savings will be 49,524 kWh/year, which is a "potential *ex-post*" energy savings. We anticipate that the actual operating savings achieved will be between the present number (32,241) and the potential (49,524), and that the originally proposed value (359,074) is not possible.

We also emphasize that the failure of this control system to achieve the desired savings is *not* because the new system does not work, but rather because the system existing prior to the retrofit (primarily room-by-room manual switches) worked adequately.

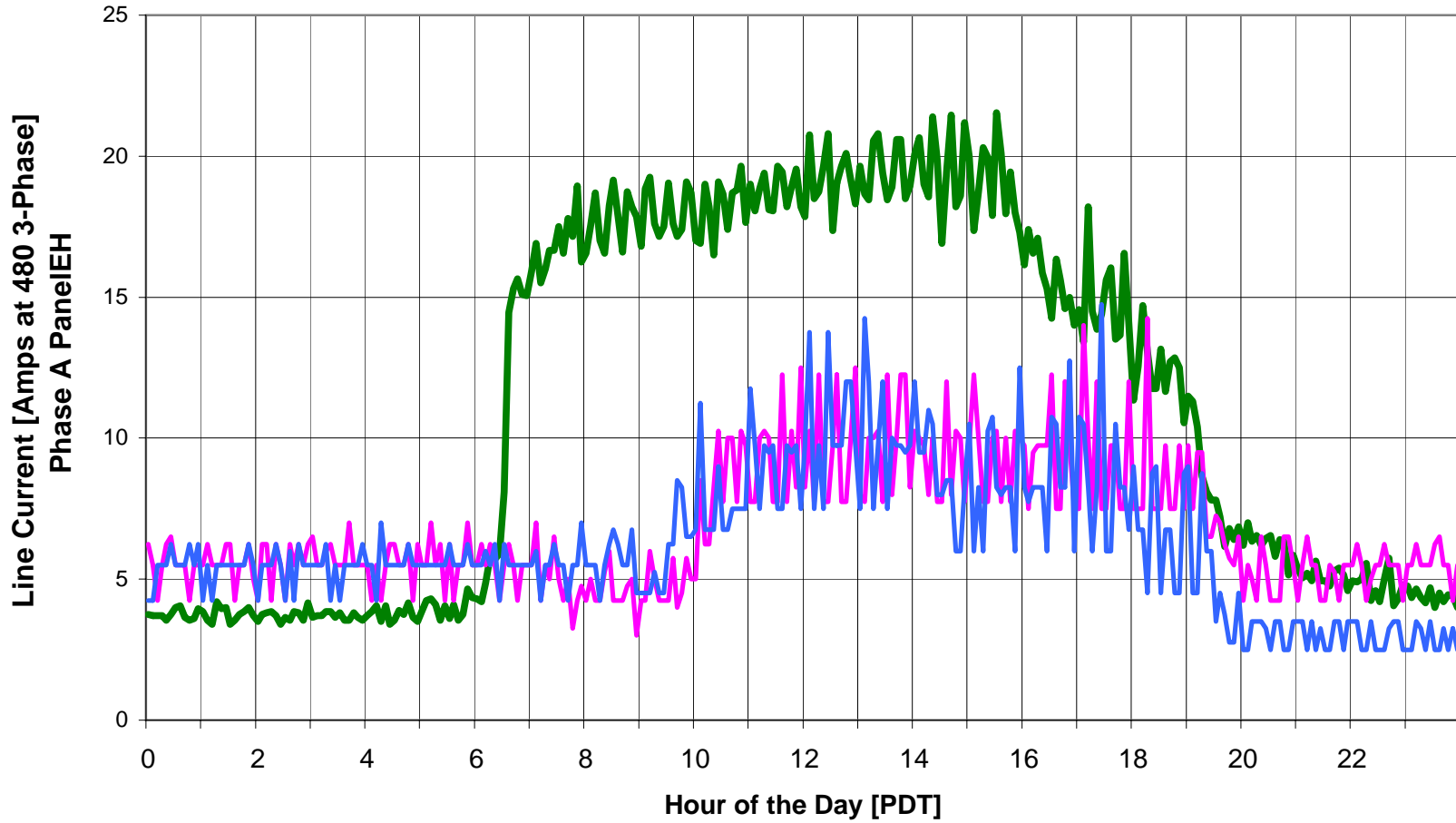
LA County Sheriff Star Center May-June 2003
Gymnasium Lights
Average Daily Load Profile



LA County Sheriff's Star Center March/April 2004
Gymnasium Lights
Average Daily Load Profile

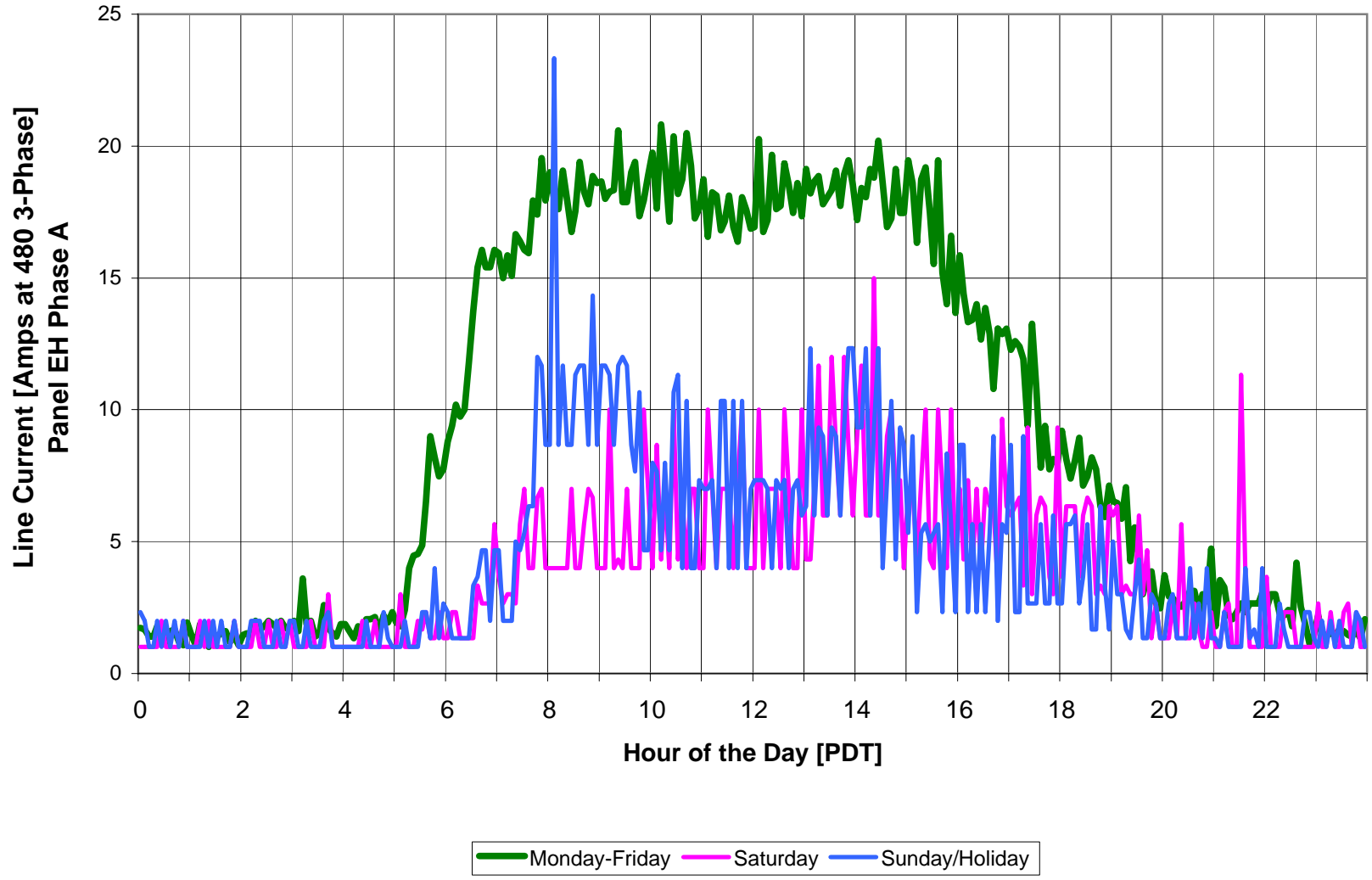


LA County Sheriff Star Center May-June 2003
Lights and an Air Conditioning Unit
Average Daily Load Profile

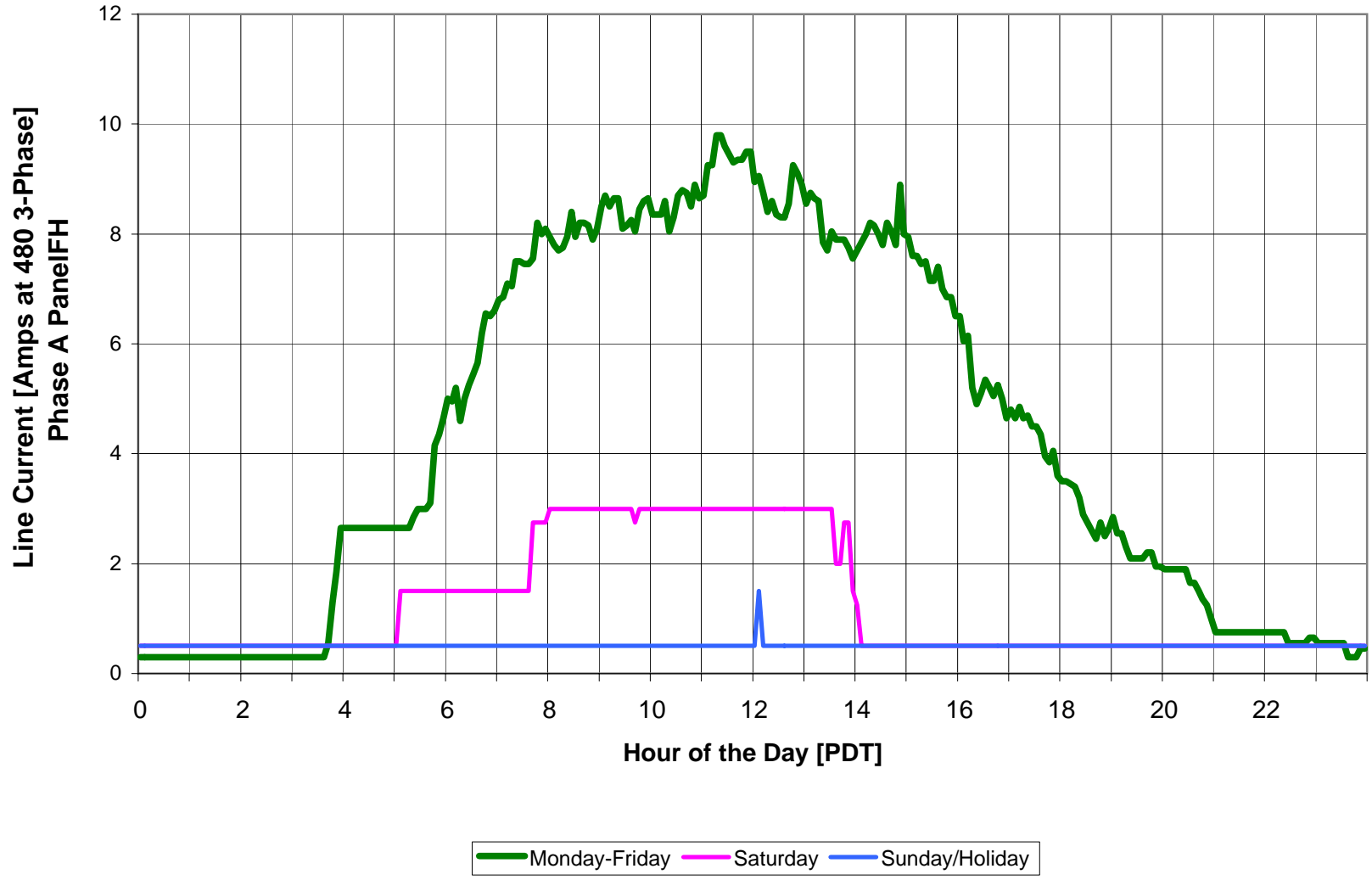


Monday-Friday Saturday Sunday/Holiday

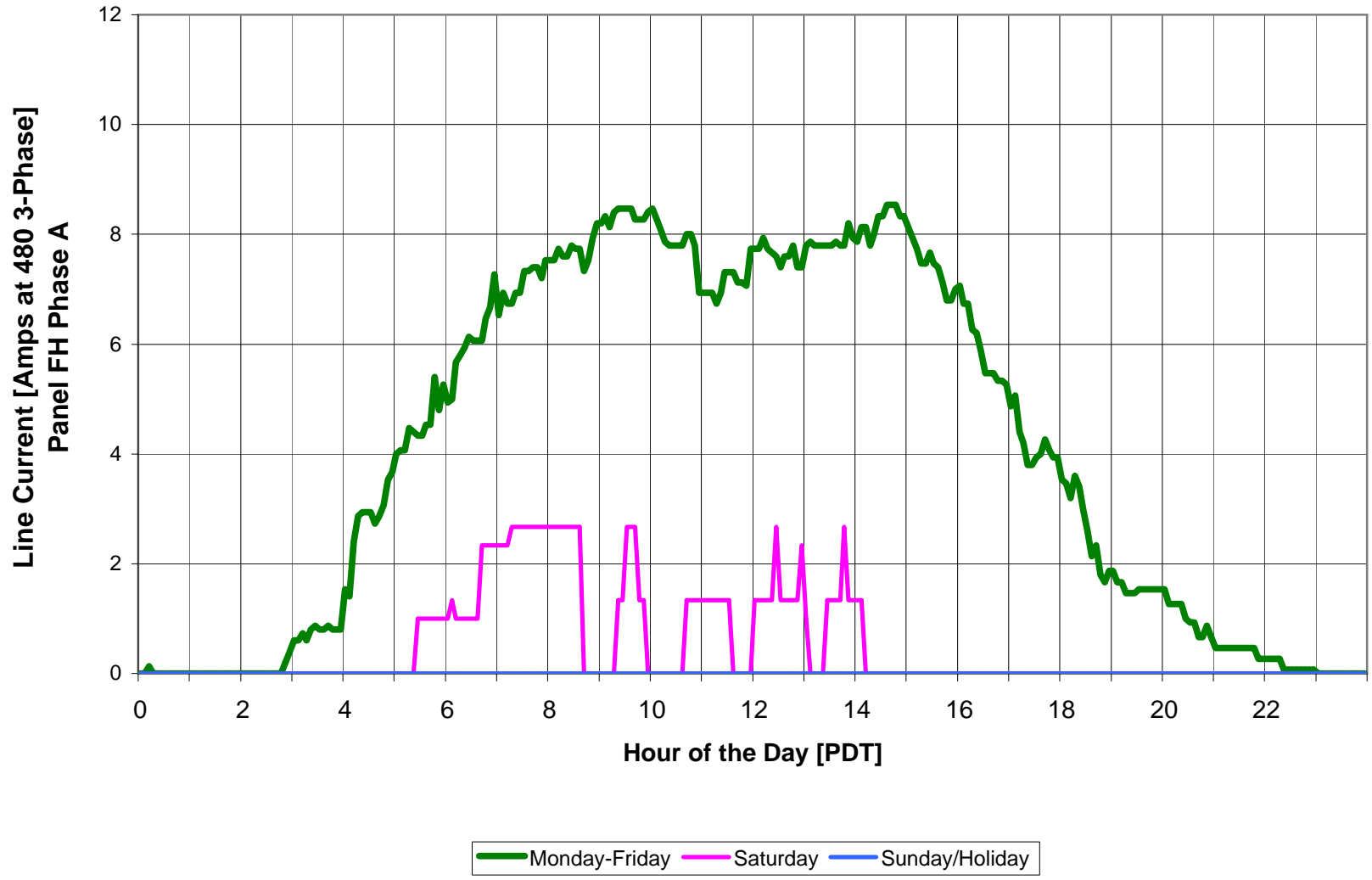
LA County Sheriff's Star Center March/April 2004
Lights and Air Conditioning Unit
Average Daily Load Profile



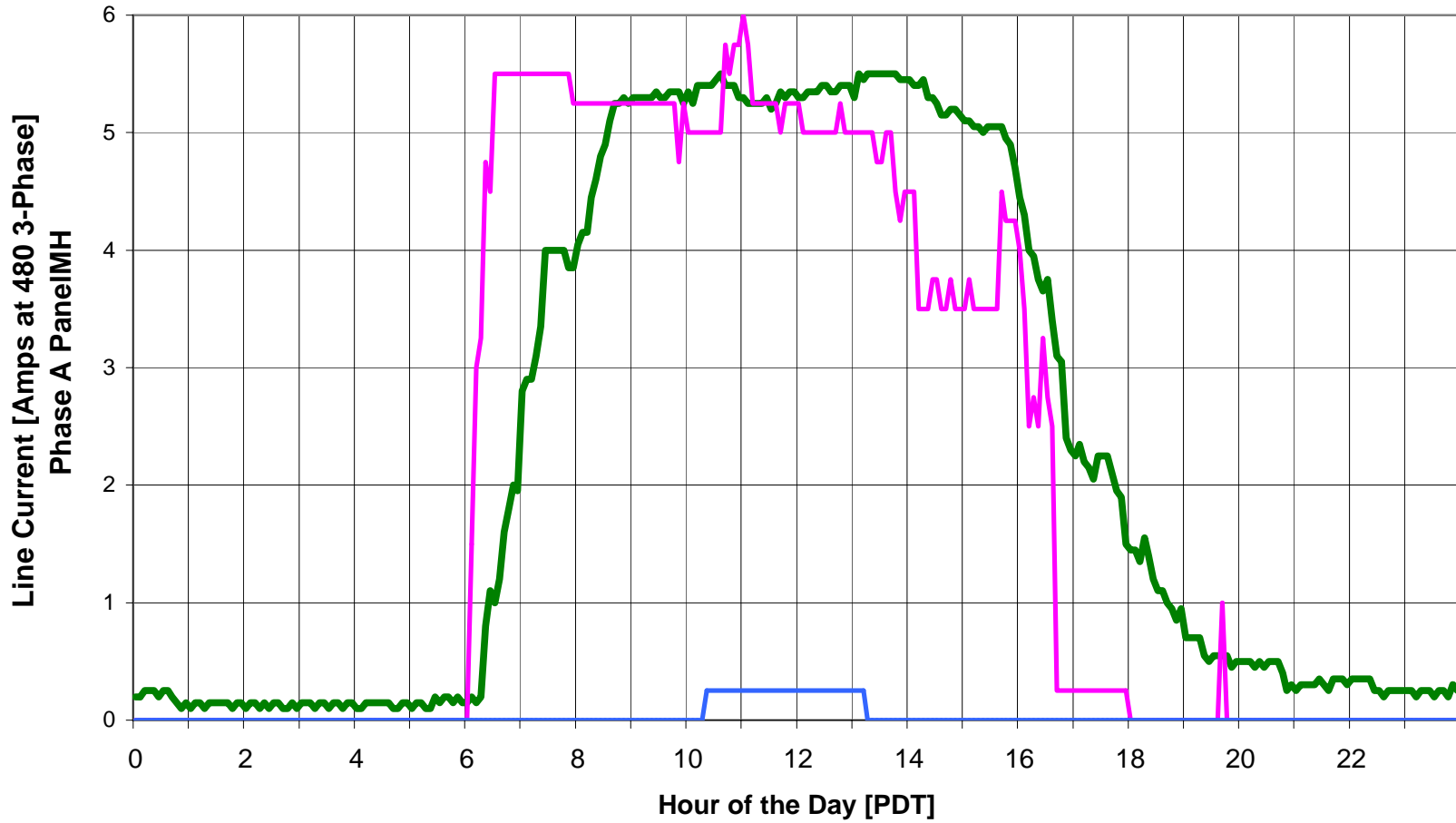
LA County Sheriff Star Center May-June 2003
Lights
Average Daily Load Profile



LA County Sheriff's Star Center March/April 2004
Lighting Building F
Average Daily Load Profile

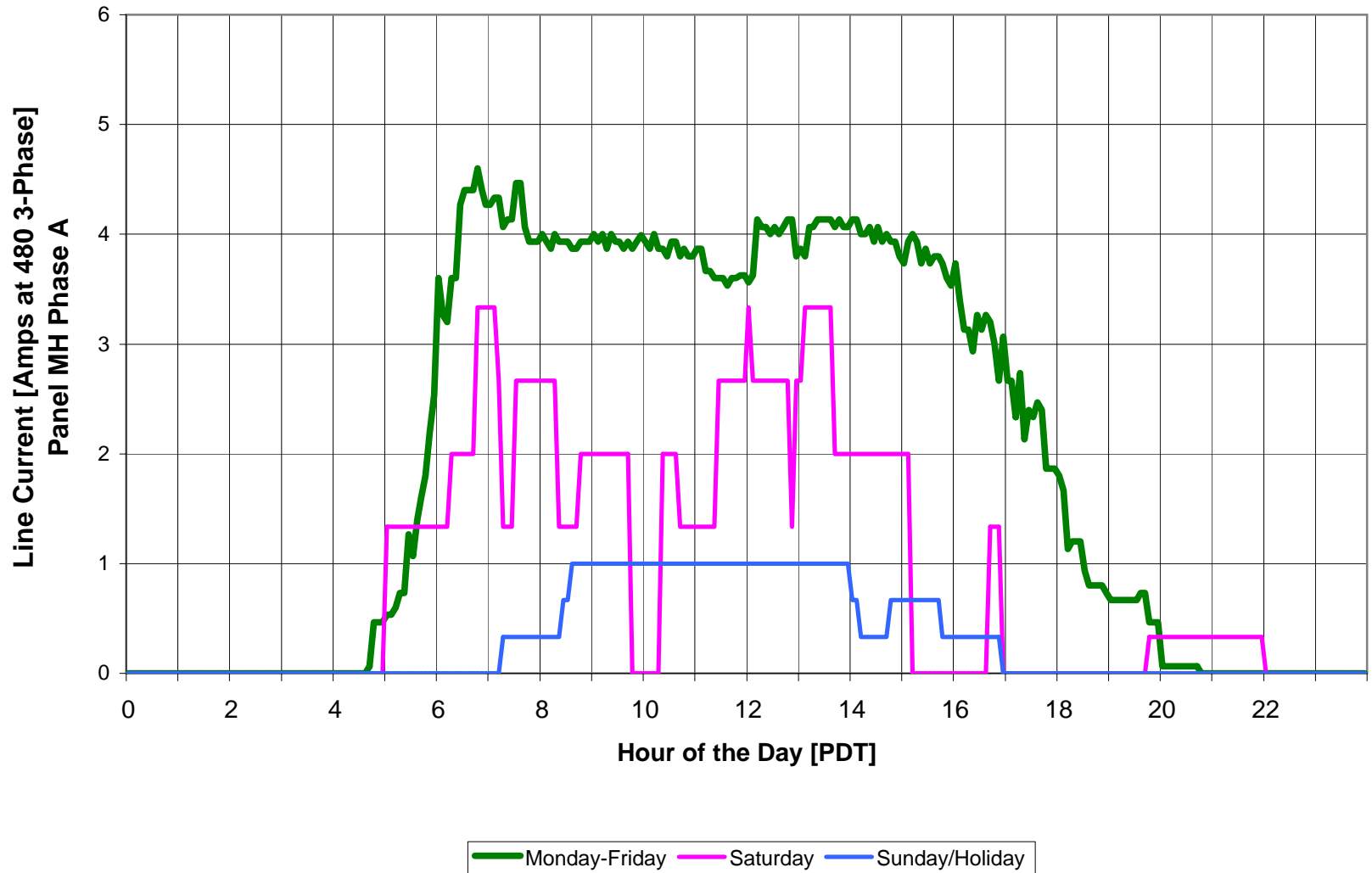


LA County Sheriff Star Center May-June 2003
Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

LA County Sheriff's Star Center March/April 2004
Lighting Building M
Average Daily Load Profile





LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel AH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	8.79	2.42	2.43	0.23	1.00
B	11.47	3.17	3.21	0.47	0.99
C	9.75	2.65	2.67	0.33	0.99
TOT/AVG	10.00	8.24	8.31	1.03	0.99

No adjustments needed for Panel AH



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel BH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	16.91	4.71	4.74	0.53	0.99
B	14.40	3.96	3.98	0.40	1.00
C	8.46	2.35	2.35	0.17	1.00
TOT/AVG	13.26	11.02	11.07	1.10	1.00

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Breaker #2 (duct heater)	6.00				
Breaker #4 (duct heater)		5.60			
Breaker #6 (duct heater)			5.56		
Current Total	6.00	5.60	5.56		
Real Power [kW] Total	1.66	1.55	0.00		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel BH Adjusted Power Readings		
Phase	Current	Real P [kW]
A	10.91	3.05
B	8.80	2.41
C	2.90	2.35
TOT/AVG	7.54	7.81



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel CH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	7.34	2.02	2.04	0.32	0.99
B	15.47	4.28	4.34	0.73	0.99
C	13.50	3.68	3.72	0.54	0.99
TOT/AVG	12.10	9.98	10.10	1.59	0.99

No adjustments needed for Panel CH



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel DH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	19.69	5.43	5.49	0.83	0.99
B	11.16	3.11	3.14	0.50	0.99
C	14.11	3.86	3.91	0.57	0.99
TOT/AVG	14.99	12.40	12.54	1.90	0.99

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Breaker #2 (zone 13)	4.18				
Breaker #4 (zone 13)		3.86			
Breaker #5 (zone 13)			3.12		
Current Total	4.18	3.86	3.12		
Real Power [kW] Total	1.16	1.07	0.86		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel DH Adjusted Power Readings		
Phase	Current	Real P [kW]
A	15.51	4.27
B	7.30	2.04
C	10.99	3.00
TOT/AVG	11.27	9.31



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel EH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	19.20	5.29	5.31	0.71	0.99
B	6.11	1.64	1.70	0.30	0.99
C	15.59	4.30	4.33	0.46	0.99
TOT/AVG	13.63	11.23	11.34	1.47	0.99

No adjustments needed for Panel EH



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel FH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	11.73	3.22	3.25	0.44	0.99
B	14.30	3.94	3.99	0.60	0.99
C	17.43	4.86	4.91	0.75	0.99
TOT/AVG	14.49	12.02	12.15	1.79	0.99

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Breaker #20	5.50				
Breaker #21		4.31			
Breaker #22		6.41			
Breaker #23			6.67		
Breaker #24			5.51		
Current Total	5.50	10.72	12.18		
Real Power [kW] Total	1.52	2.97	3.37		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel FH Adjusted Power Readings		
Phase	Current	Real P [kW]
A	6.23	1.70
B	3.58	0.97
C	5.25	1.49
TOT/AVG	5.02	4.15



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel HH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	0.00	0.00	0.00	0.00	0.00
B	0.95	0.26	0.27	0.06	0.98
C	1.06	0.30	0.30	0.05	0.99
TOT/AVG	0.67	0.56	0.57	0.11	0.66

No adjustments needed for Panel HH

Panel HHA					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	5.72	1.60	1.62	0.27	0.99
B	0.65	0.18	0.18	0.01	0.98
C	4.36	1.22	1.23	0.19	0.99
TOT/AVG	3.58	3.00	3.03	0.47	0.99

No adjustments needed for Panel HHA

Panel IH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	17.29	4.80	4.87	0.71	0.99
B	12.86	3.51	3.55	0.53	0.99
C	9.93	2.70	2.73	0.40	0.99
TOT/AVG	13.36	11.01	11.15	1.64	0.99

No adjustments needed for Panel IH



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel KH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	9.12	2.16	2.52	1.28	0.86
B	7.68	2.13	2.16	0.37	0.99
C	4.36	1.20	1.22	0.20	0.99
TOT/AVG	7.05	5.49	5.90	1.85	0.95

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Breaker #8 (classroom)	1.84				
Breaker #10 (classroom)		2.00			
Breaker #11 (classroom)			1.97		
Current Total	1.84	2.00	1.97		
Real Power [kW] Total	0.51	0.55	0.55		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel KH Adjusted Power Readings		
Phase	Current	Real P [kW]
A	7.28	1.65
B	5.68	1.58
C	2.39	0.65
TOT/AVG	5.12	3.88



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

Panel LA					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	26.58	3.00	3.22	1.18	0.93
B	36.80	4.00	4.40	1.80	0.91
C	9.81	0.91	1.17	0.74	0.78
TOT/AVG	24.40	7.91	8.79	3.72	0.87

The following loads are not being controlled. These readings are subtracted from the table above then the adjustments are shown in the "Adjusted Power Readings" table below.

Circuit # - Desc.	Current 'A'	Current 'B'	Current 'C'		
Breaker #15		0.50			
Breaker #17			0.12		
Current Total	0.00	0.50	0.12		
Real Power [kW] Total	0.00	0.14	0.03		

The following table represents the lighting load after other non-lighting loads have been subtracted from the "Power Readings" table at the top of the page

Panel LA Adjusted Power Readings		
Phase	Current	Real P [kW]
A	26.58	3.00
B	36.30	3.86
C	9.69	0.88
TOT/AVG	24.19	7.74



LA County CPUC Local Program #156-02

Site 24 - Sheriff Star Center

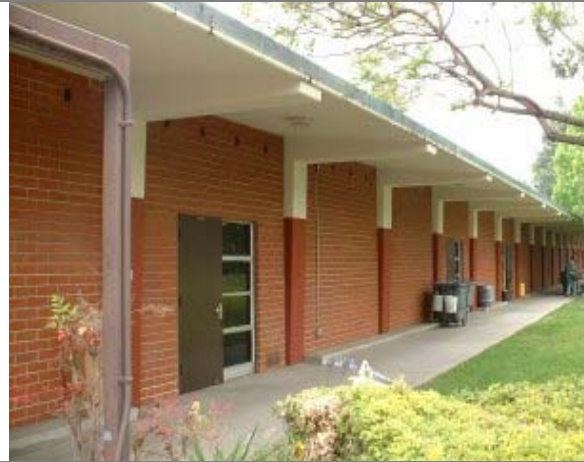
Panel MH					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	8.85	2.41	2.44	0.39	0.99
B	7.55	2.07	2.10	0.37	0.98
C	2.37	0.66	0.67	0.11	0.99
TOT/AVG	6.26	5.14	5.21	0.87	0.99

No adjustments needed for Panel MH

Sheriff's Star Center – 11515 Colima Rd.



Building D Outside



Building E Outside



Building F Outside



Building M Outside



Gym Lighting



Gym Lighting Switches

Sheriff's Star Center – 11515 Colima Rd.



Old Panel DH



New Panel DH



Old Panel EH



New Panel EH



Old Panel FH



New Panel FH

Sheriff's Star Center – 11515 Colima Rd.



New Panel AH



New Panel BH



New Panel CH



New Panel HH



New Panel HHA



New Panel IH

Sheriff's Star Center – 11515 Colima Rd.



New Panel KH



New Panel LA



New Panel MH

Site Measurement and Verification Report

Site Number 24A

LA County Public Works Department

900 South Fremont, Alhambra

Annual Energy Savings Estimates	
Building Area	536,168 ft ²
LA County Estimate at 1.31 kWh/ft ²	703,101 kWh
Ex-Ante Evaluation	703,101 kWh
Aloha Ex-Post Measured Evaluation	80,999 kWh
Potential <i>Ex-Post</i> Savings	212,020 kWh

Site Description

The Public Works building is a 12-story office building located in Alhambra.

The lighting control setup on all of the panels is set to turn on lights at 6:15, 6:30, and 6:45 a.m. and turn off the lights at 5:00 p.m. The reason lights are turned on in this manner is due to different start times in different areas of the building. There is an override button available to staff that allows the system to be overridden to be on for an additional two hours before turning the lights off.

Controls Locations

A total of twenty-six new control units were installed on the lighting panels as part of the energy efficiency program. All of the old panels were replaced with new Square D panels. The Square D panels are model NF2000G3 and can control each individual breaker in the entire lighting panel. There are two panels on each of the twelve floors as well as the basement and mezzanine.

Preliminary Site Visit

The site was visited on October 30, 2003. During the visit power measurements were taken and dataloggers were installed in the electrical panels on five different floors. The basement panels (Panels HBA and HBB) were monitored directly at the circuit breakers feeding these panels. On floors 2 through 12 there are two 480V lighting panels on each floor, one serving the west half and the other serving the east half of the building. The lighting panels are wired from a common bus so that the bus on every third floor feeds the panel on that floor, the floor directly below and the floor directly above that floor. The bus located above Panel H3A, for example, is located on the third floor. It feeds Panel H2A directly below it, Panel H3A, and Panel H4A directly above it.

Dataloggers were installed to provide a “pre-controls” load profile. We monitored all three phases of most of the panels measured. We used a total of 16 loggers, Three each were used in buses located directly above Panels H3A, H6B, H9A, and H11B, covering Floors 2 through 12 with alternating halves of the building. Two loggers each

were installed on the breakers feeding Panels HBA and HBB serving the basement and first floor. This load profile documents the operation of each panel before the installation of the new panels and control systems.

Post-Retrofit Audit

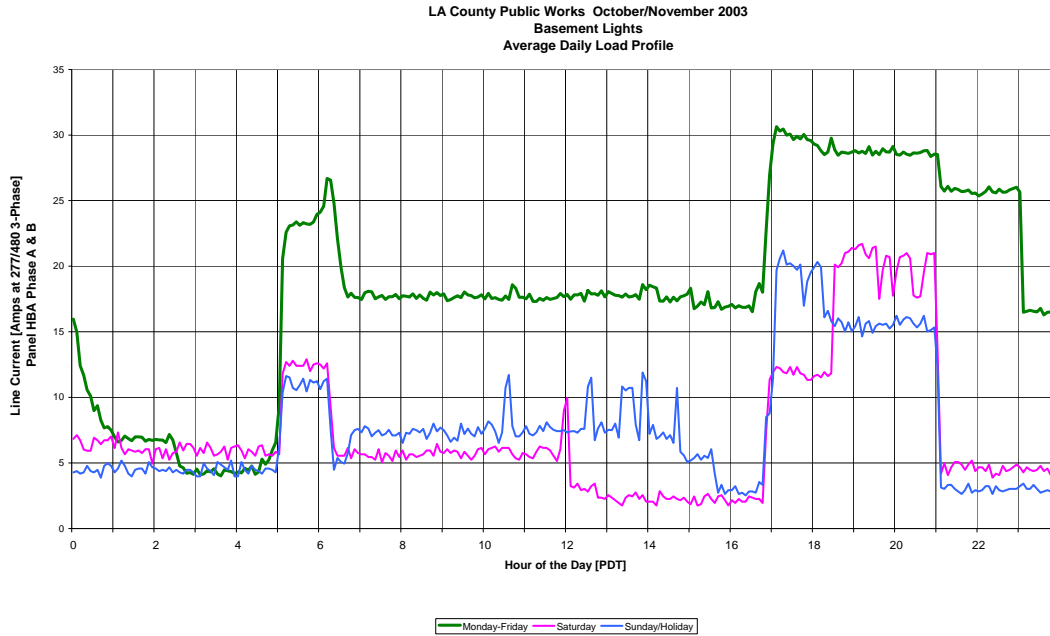
The site was again visited on March 17, 2004. We took power measurements for thirteen of the lighting panels. We installed dataloggers for the same six lighting panels.

Metered Load Profiles

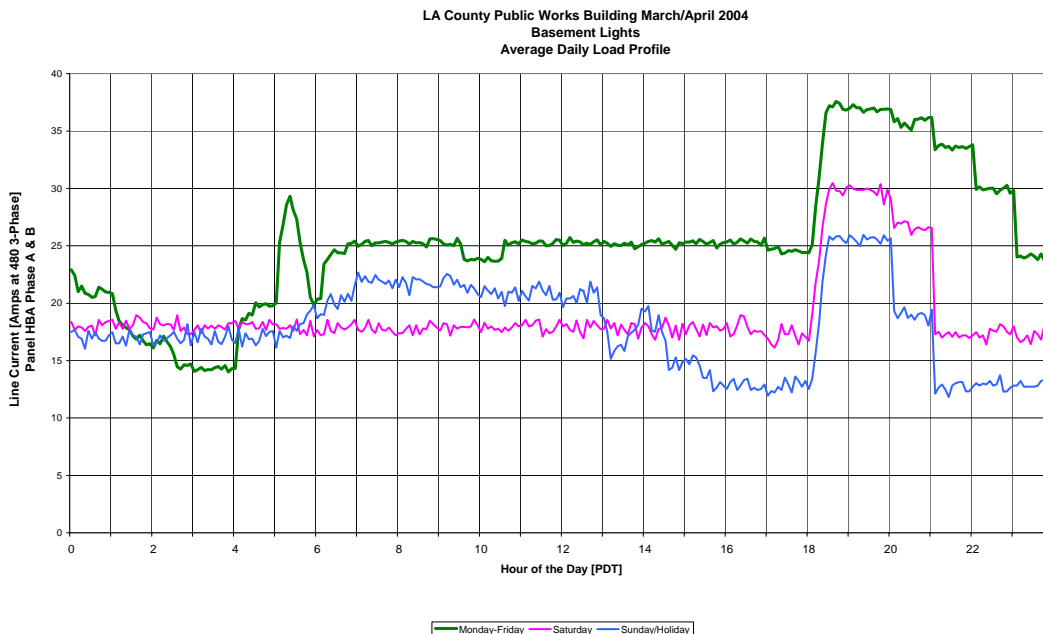
We collected interval data for lighting loads in the areas as described above. Following are the graph presentations of the load profiles from these panels. We have summed the data from each of the phases to provide overall loading of the panels. In most cases the load profiles of the individual phases were similar to those of the other phases within the same panel.

Panel HBA. This lighting panel controls lights in the basement. The panel is located in the electric room in the maintenance shop. The power draw of the lights on this panel is 8.33 kW. The full-load operating time before installation was 3,632 hours per year. The post-installation equivalent operating time was 5,639 h/yr, indicating the system increased operating time by 2,007 hours per year.

Pre-Installation

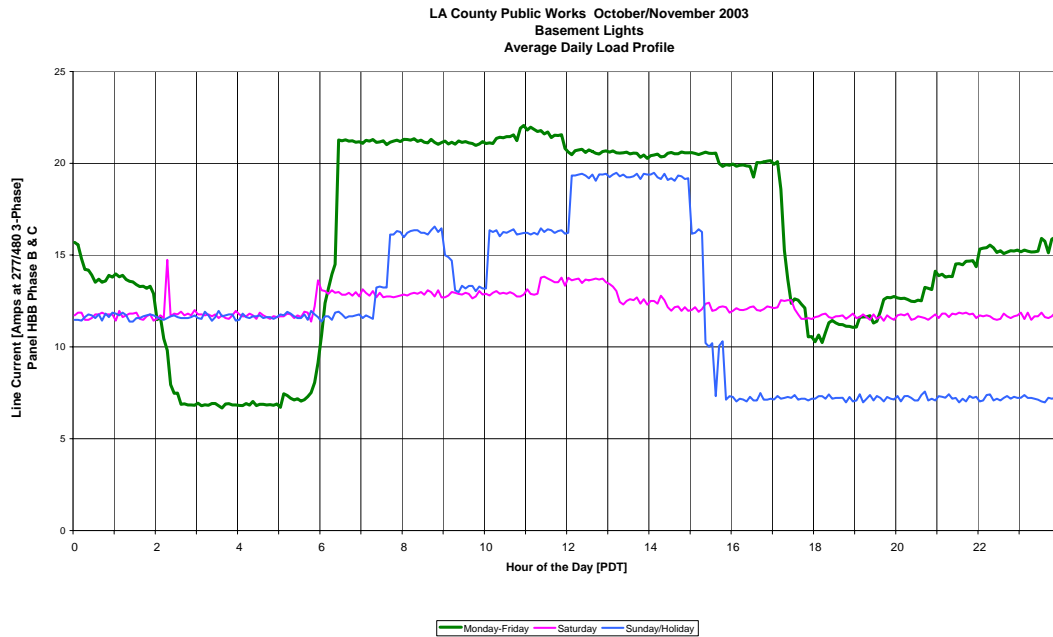


Post-Installation

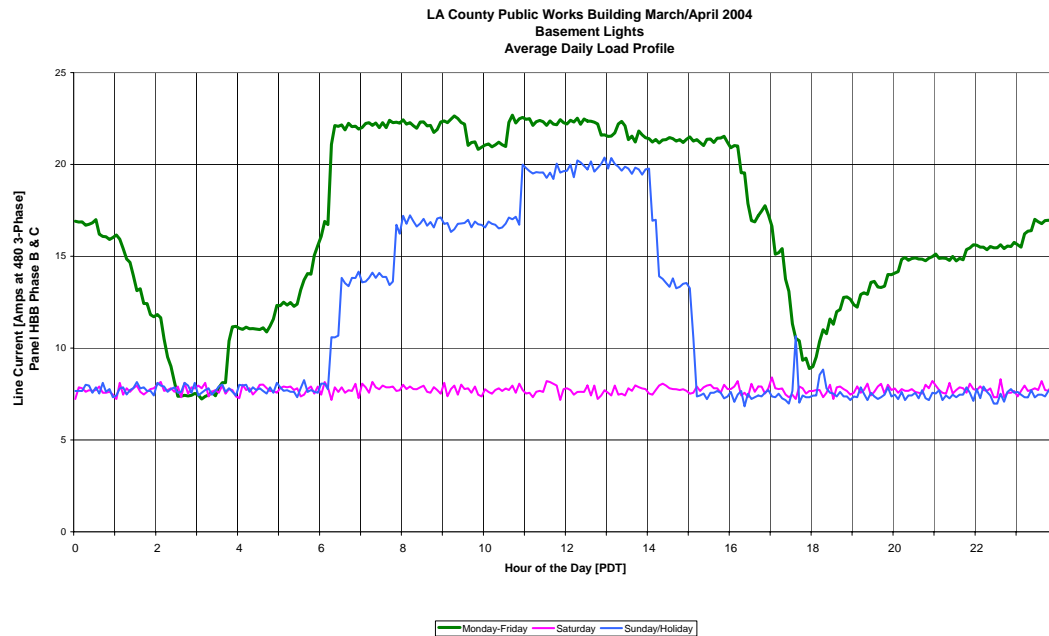


Panel HBB: This lighting panel controls lights in the basement. Breakers 8-18 are spare breakers not being controlled on this lighting panel. The recorded power draw of the lights on this panel was 8.34 kW. The equivalent full-load operating time before installation was 5,114 hours per year. The post-installation equivalent operating time was 5,128 h/yr, indicating the system increased operating time by 14 hours per year.

Pre-Installation

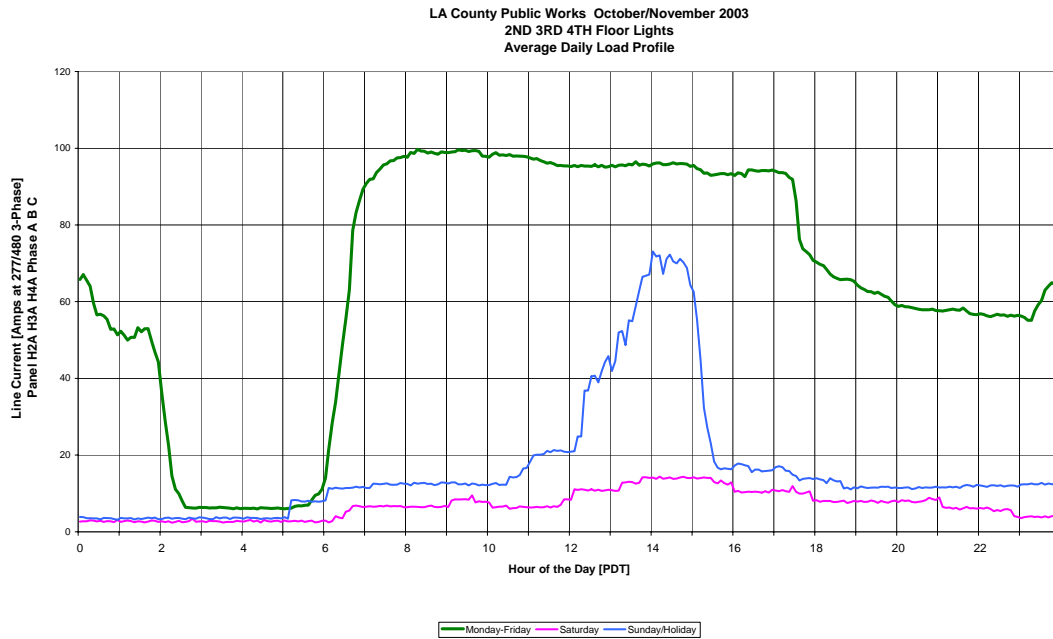


Post-Installation

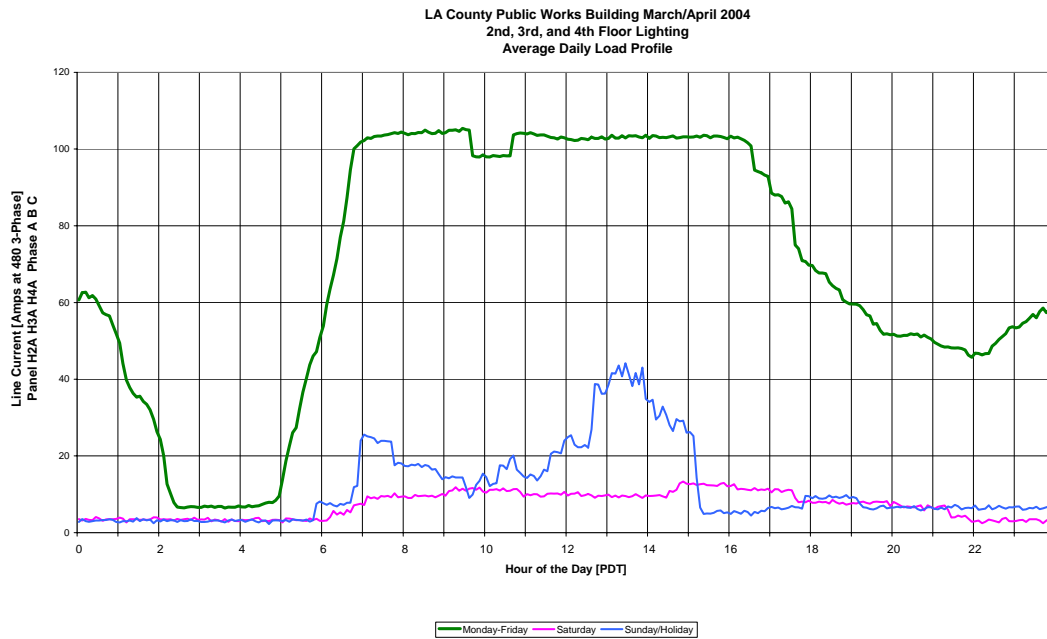


Panels H2A, H3A, H4A: The common bus located above Panel H3A sends power to panels that control lights on the east side of the 2nd, 3rd, and 4th floor. The power draw of the lights is 32.96 kW. The equivalent full-load operating time before installation was 3,184 hours per year. The post-installation equivalent operating time was 3,241 h/yr, indicating the system increased operating time by 57 hours per year.

Pre-Installation

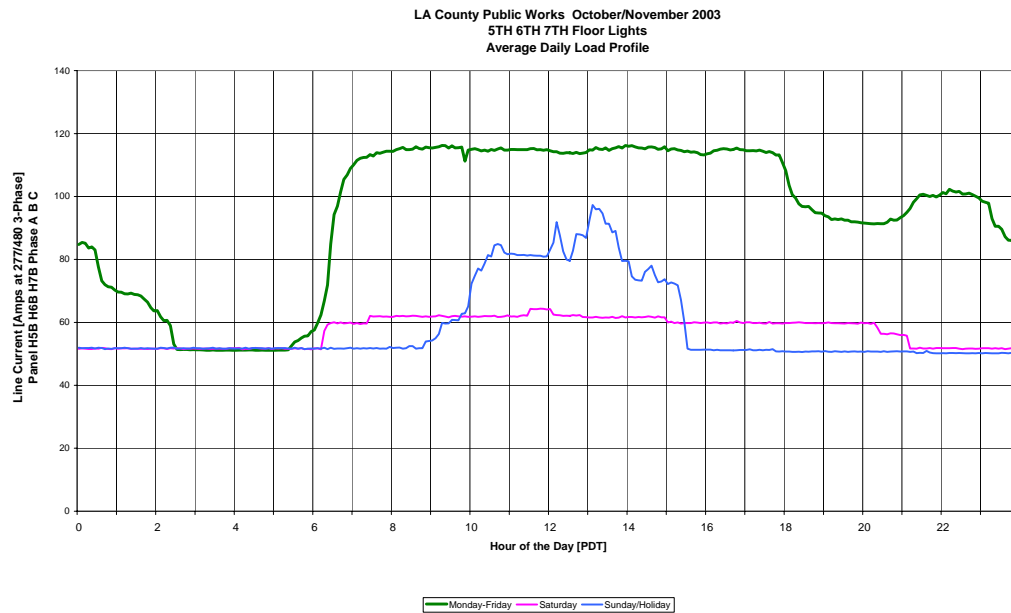


Post-Installation

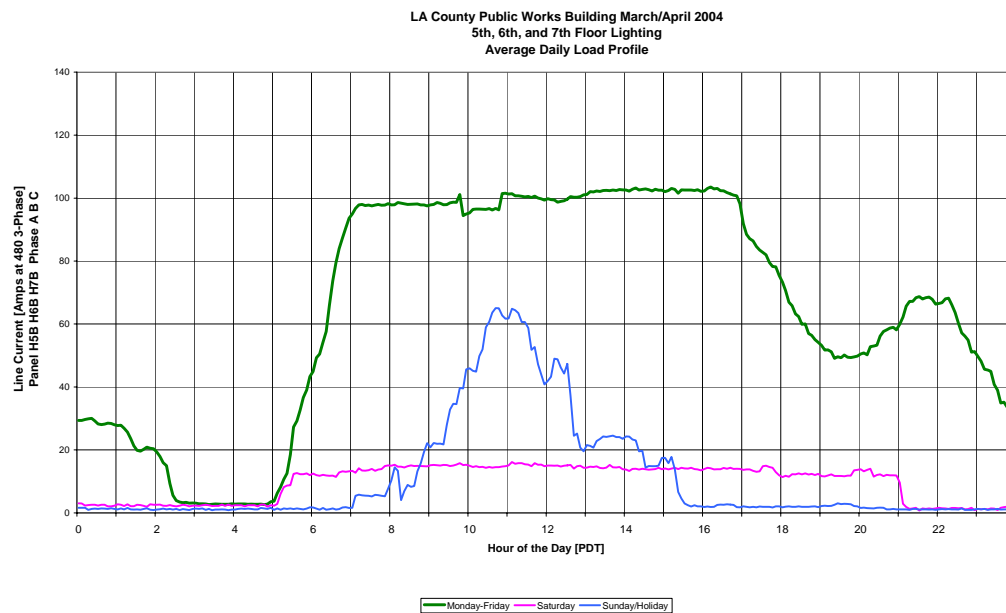


Panels H5B, H6B, H7B: The common bus located above Panel H6B sends power to panels that control lights on the west side of the 5th, 6th, and 7th floors. The power draw of the lights is 30.08 kW. The equivalent full-load operating time before installation was 5,289 hours per year, which included the Phase B component that ran 24 hours per day. The post-installation equivalent operating time was 3,074 h/yr, indicating the system decreased operating time by 2,215 hours per year. Note that the continuous load was eliminated by the new control system.

Pre-Installation

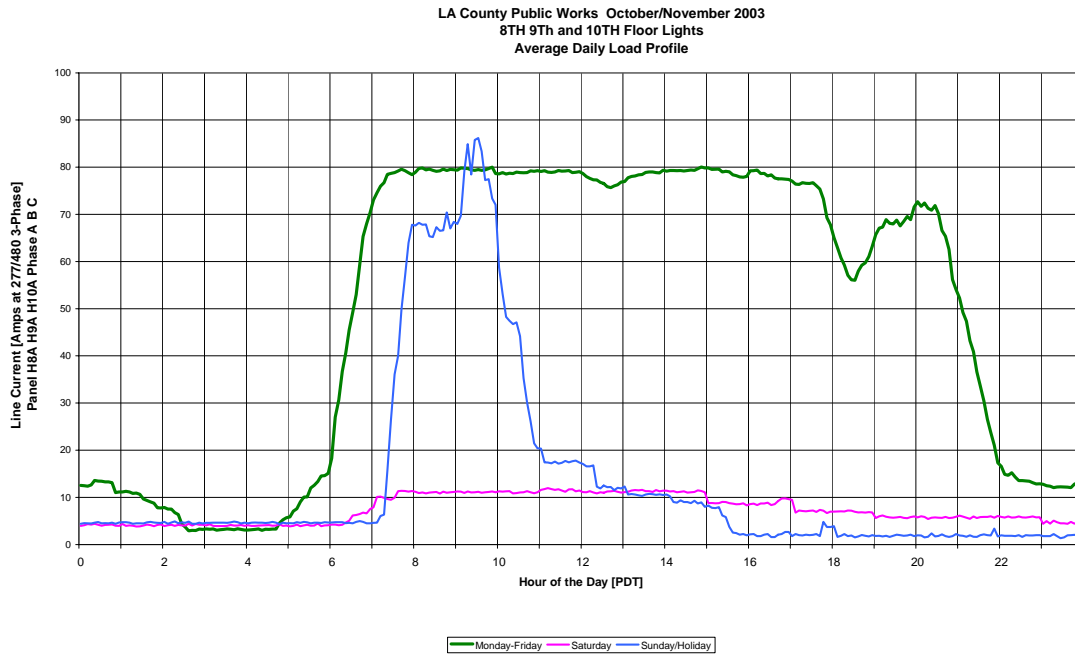


Post-Installation

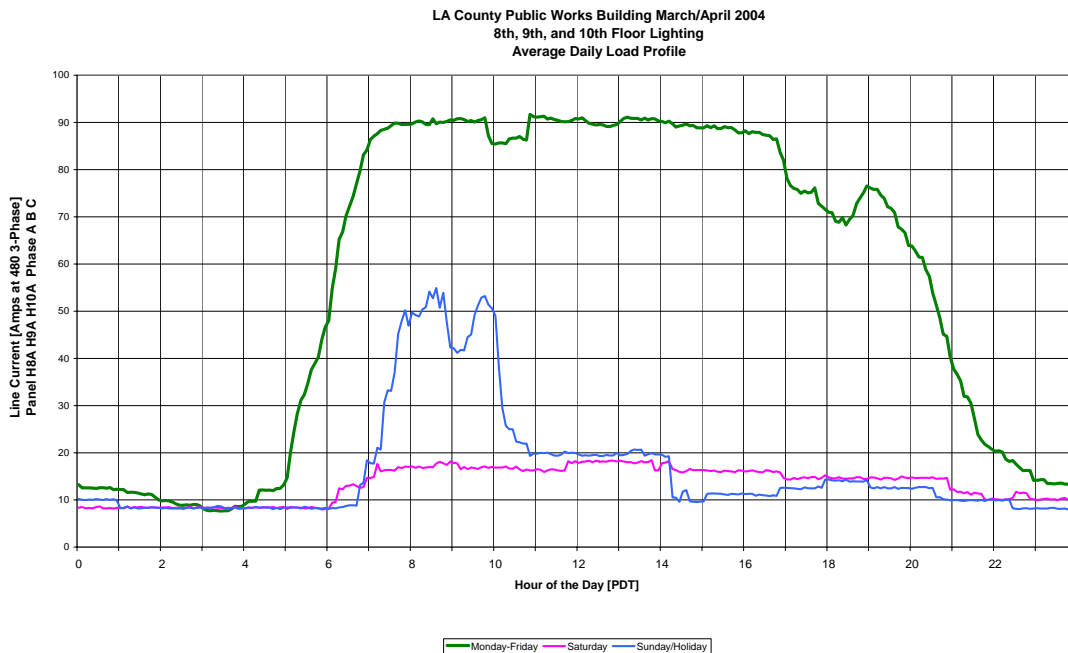


Panel H8A, H9A, H10A: The common bus located above Panel H9A sends power to panels that control lights on the east side of the 8th, 9th, and 10th floors. The power draw of the lights is 26.61 kW. The equivalent full-load operating time before installation was 3,172 hours per year. The post-installation equivalent operating time was 3,685 h/yr, indicating the system increased operating time by 513 hours per year.

Pre-Installation

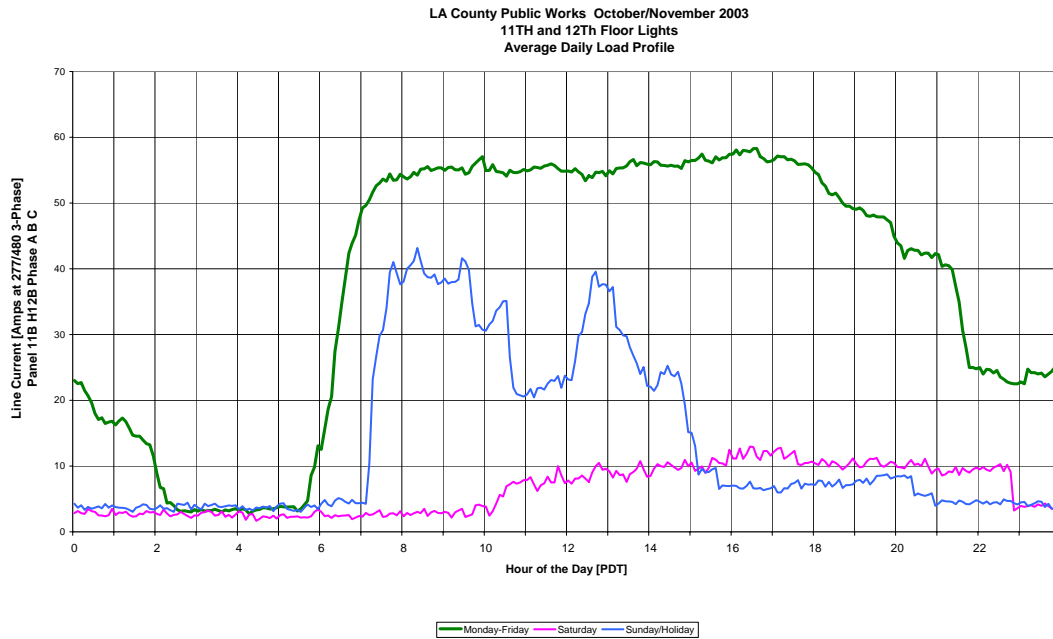


Post-Installation

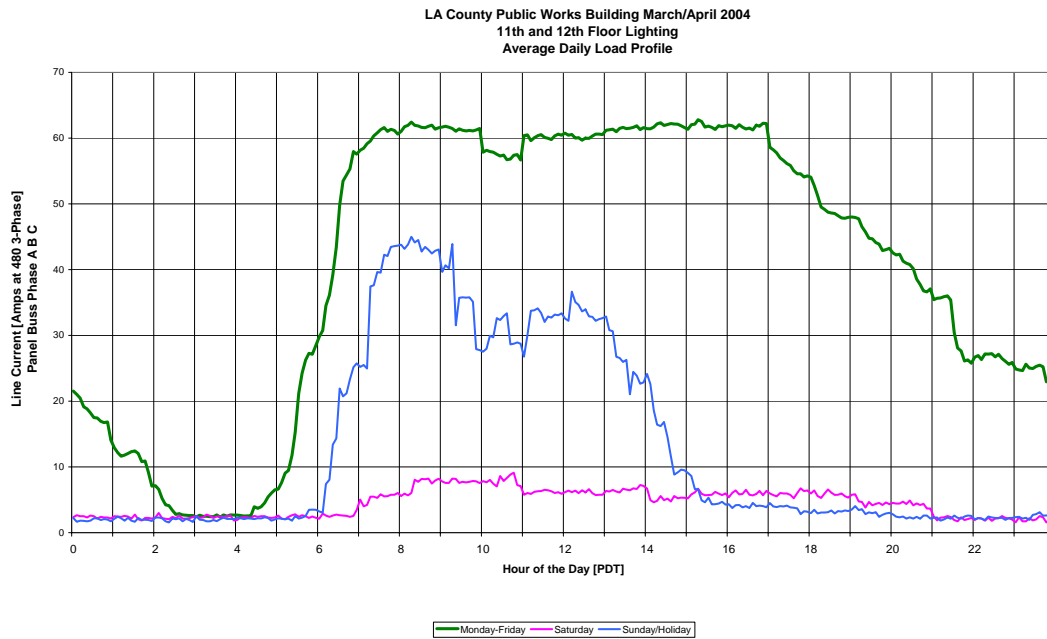


Panels H11B, H12B: The common bus located above Panel H11B sends power to panels that control lights on the west side of the 11th and 12th floors. The power draw of the lights is 19.83 kW. The equivalent full-load operating time before installation was 3,438 hours per year. The post-installation equivalent operating time was 3,626 h/yr, indicating the system increased operating time by 188 hours per year.

Pre-Installation



Post-Installation



Non-Monitored Panels

We purposefully selected alternating east and west panels to monitor, assuming that the other panel on the same floor operated with a similar load profile as the one monitored. However, the power demands of these panels were measured. Panel 3B was assumed to operate similar to Panel 3A. Panel 6A was assumed to operate similar to Panel 6B. Panel 9B was assumed to operate similar to Panel 9A. Panel 11A was assumed to operate similar to Panel 11B.

Panels HMA and HGA control mezzanine (first floor) lights. Panel HGA is fed by Panel HMA. The hours of operation for the two panels were assumed to be represented by the average of all the panels monitored. The total power demand is 14.46 kW.

Energy Savings Calculations

The following table demonstrates the savings by the difference between the post-install kWh and the pre-install kWh for each lighting panel that is part of the project.

The table on the following page delineates the savings at this site for each of the lighting panels included in the project. The annual savings is the full-load demand (kW) multiplied by the change in equivalent full-load operating hours as determined by comparing the pre- and post-control load profiles for the same locations. Negative numbers indicate increased operation after the controls were installed and result in increased energy consumption on these panels. The following table delineates the kWh savings at this site.

Public Works Department Lighting Control Systems Annual kWh Savings (Measured)					
Panel Name	Measured kW	Pre-Control Hours	Post-Control Hours	Operating Hour Reduction	kWh Saved
HBA	8.33	3632	5639	-2007	-16,718
HBB	8.34	5114	5128	-14	-117
H2A,H3A,H4A	32.96	3184	3241	-57	-1,879
H2B,H3B,H4B	29.81	3184	3241	-57	-1,699
H5A,H6A,H7A	30.60	5289	3074	2215	67,779
H5B,H6B,H7B	30.08	5289	3074	2215	66,627
H8A,H9A,H10A	26.61	3172	3685	-512	-13,624
H8B,H9B,H10B	26.36	3172	3685	-512	-13,496
H11A, H12A	18.26	3438	3626	-188	-3,433
H11B, H12B	19.83	3438	3626	-188	-3,728
HMA, HGA	14.46	3891	3802	89	1,287
Total/Avg.	245.64	3891	3802	89	80,999

The control systems were installed late in the program and had not been implemented to their full or planned capability at the time of our post-installation data collection. The vast majority of the savings presently attributable to the controls derive from their shut-down of one third of the lights running continuously on floors 5, 6, and 7. The other floors, which did not have significant amounts of continuously running lights, generally showed increases in operating hours.

Energy Management Division plans for the Public Works Department building call for 3,000 hour per year operation throughout the facility. The following table presents the energy savings that each panel would achieve if its lights were operated 3,000 hours per year.

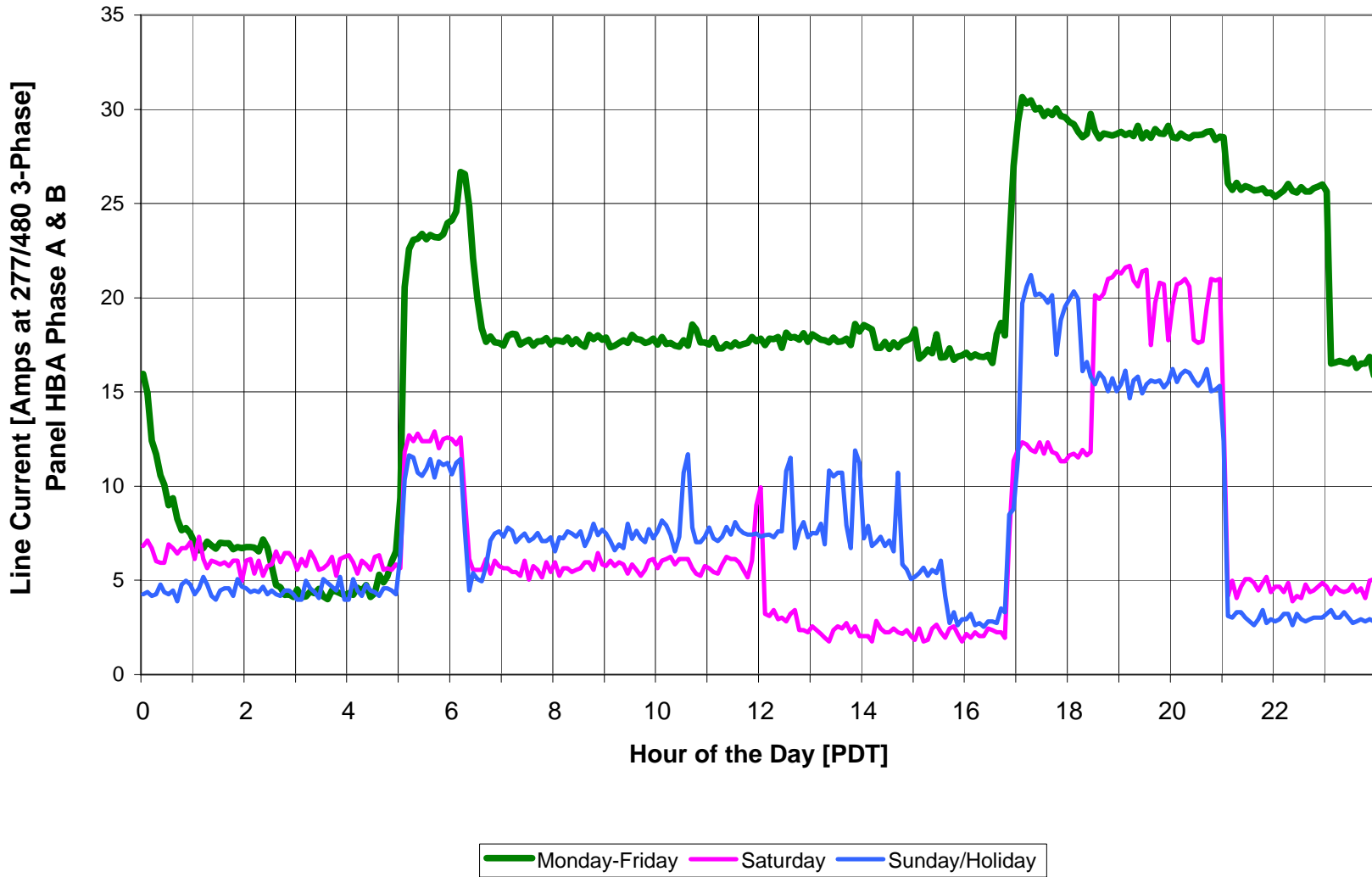
Public Works Department Lighting Control Systems Annual kWh Savings (Proposed)					
Panel Name	Measured kW	Pre-Control Hours	Proposed Control Hours	Operating Hour Reduction	kWh Saved
HBA	8.33	3632	3000	632	5,265
HBB	8.34	5114	3000	2114	17,631
H2A,H3A,H4A	32.96	3184	3000	184	6,065
H2B,H3B,H4B	29.81	3184	3000	184	5,485
H5A,H6A,H7A	30.60	5289	3000	2289	70,043
H5B,H6B,H7B	30.08	5289	3000	2289	68,853
H8A,H9A,H10A	26.61	3172	3000	172	4,577
H8B,H9B,H10B	26.36	3172	3000	172	4,534
H11A, H12A	18.26	3438	3000	438	7,998
H11B, H12B	19.83	3438	3000	438	8,686
HMA, HGA	14.46	3891	3000	891	12,884
Total/Avg.	245.64	3891	3000	891	212,020

The proposal measure unit for building controls was square feet of building area, with a total savings estimate of 1.31134 kWh/yr-ft². The Public Works Department building is 536,168 ft². We verified that lighting controls were installed to effectively control the lights throughout the entire building. Thus the *ex-ante* savings estimate is 703,101 kWh per year, which is the same as the county’s estimated savings for this site.

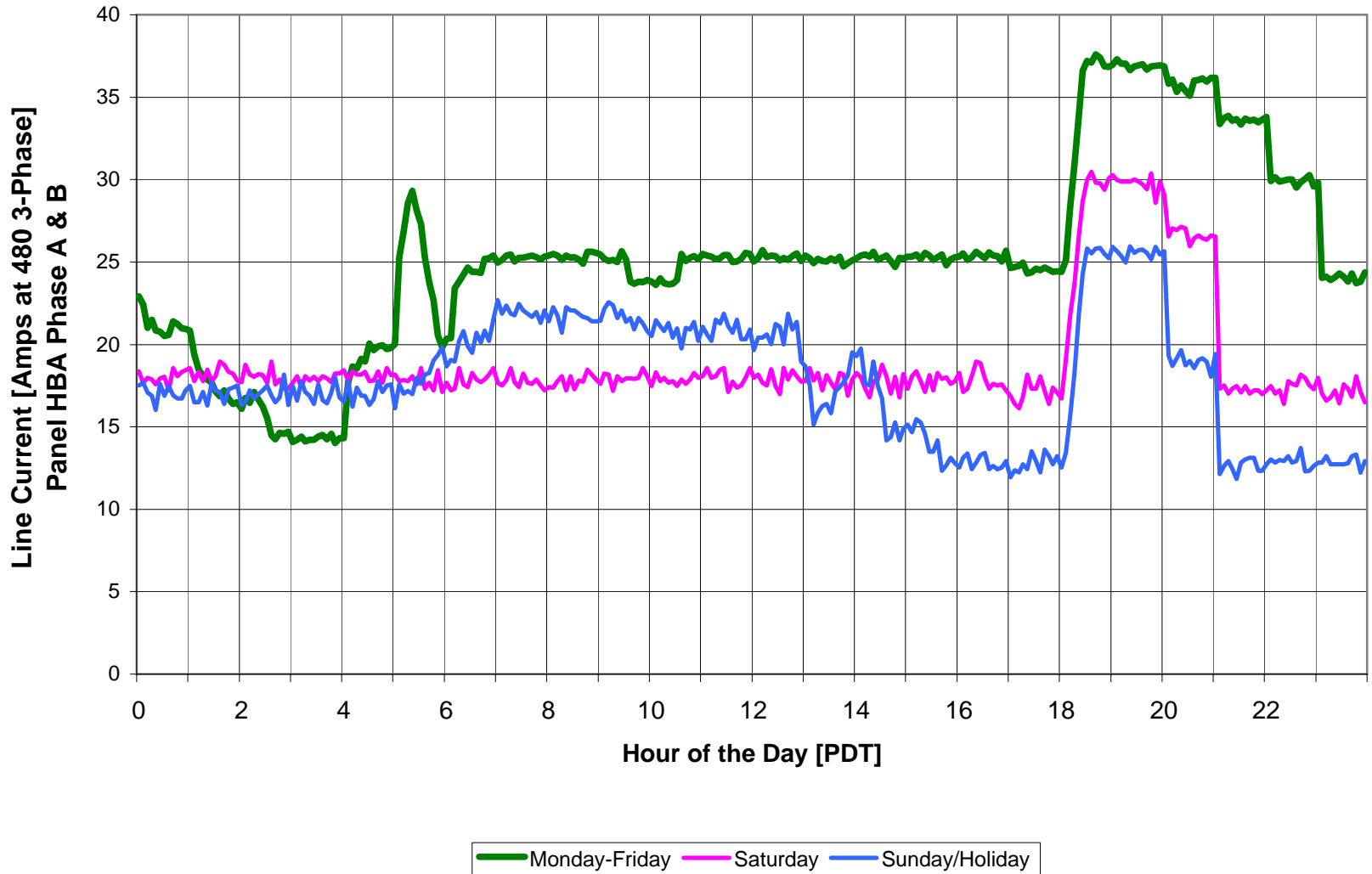
The total *ex-post* evaluation of savings for these control systems is 88,089 kWh per year as operating at the time of our metering. However, we are aware that the system had been installed late in the program period and that it was not fully commissioned during our metering period (which had to be completed in order to prepare this report in a timely manner).

If the control system is optimized and performs as proposed, the total savings will be 212,020 kWh/year, which is a “potential *ex-post*” energy savings. We anticipate that the actual operating savings achieved will be between the present number (-130,808) and the potential (216,019), and that the originally proposed value (703,101) is not possible.

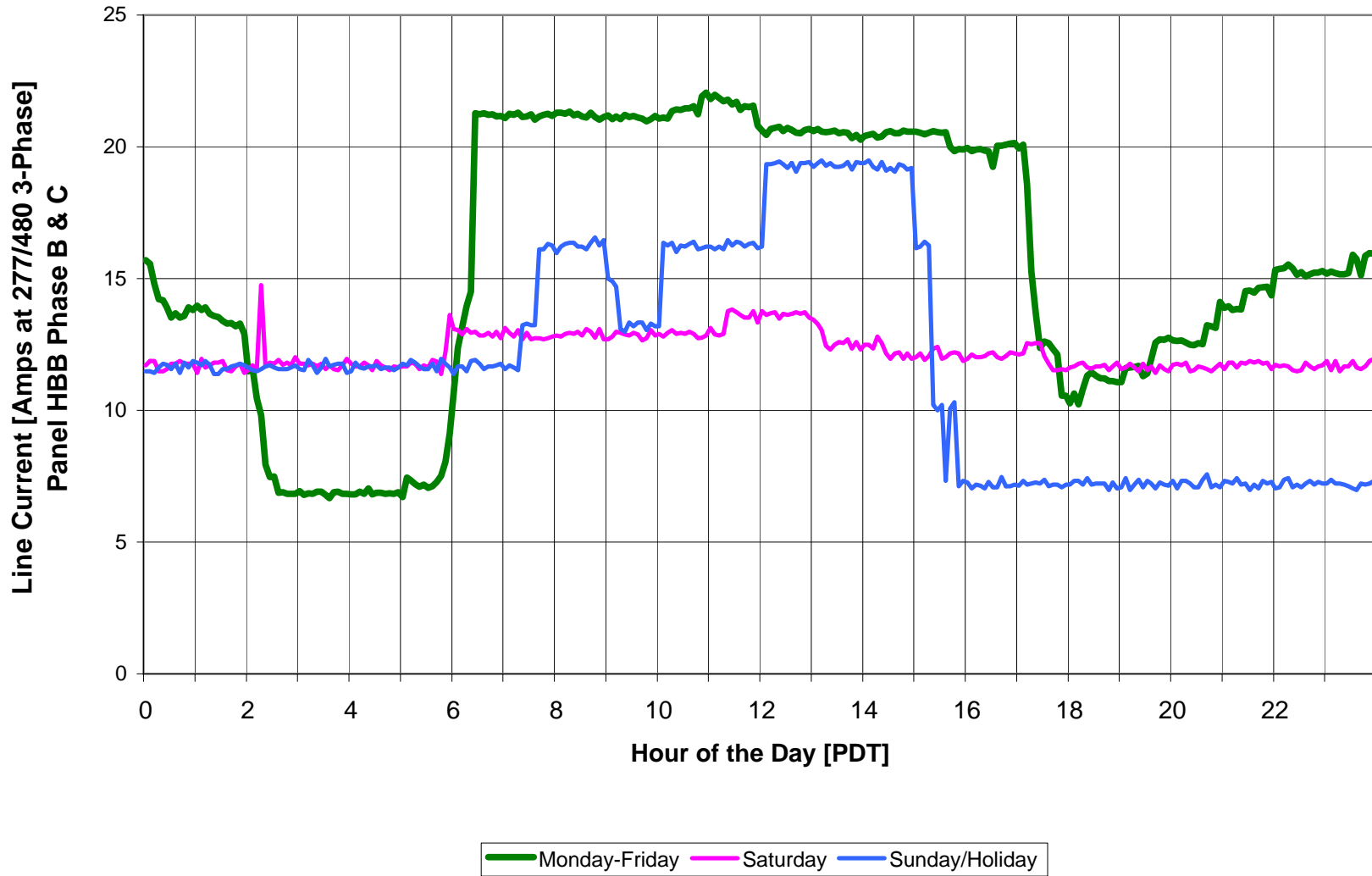
LA County Public Works October/November 2003
Basement Lights
Average Daily Load Profile



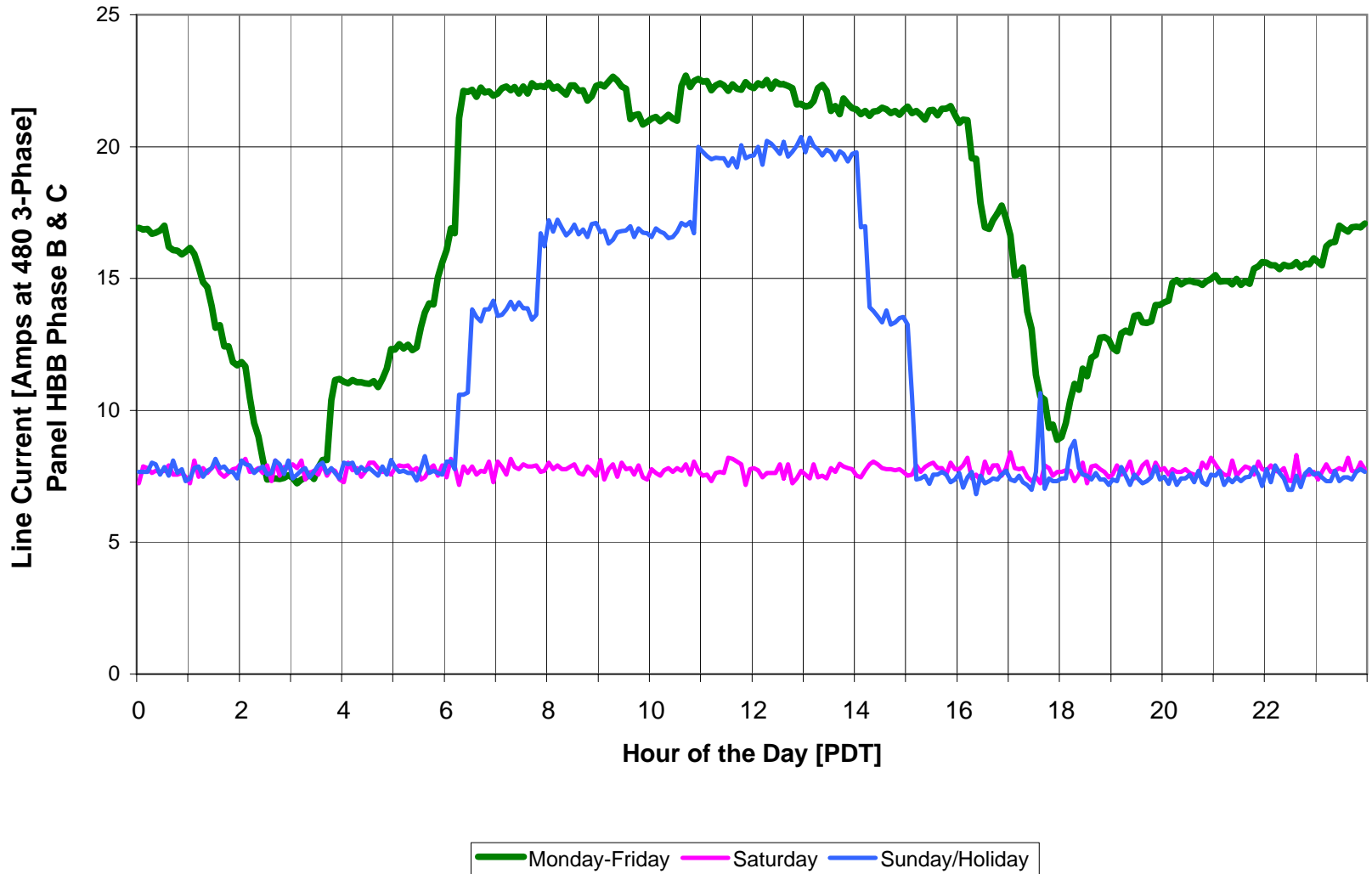
LA County Public Works Building March/April 2004
Basement Lights
Average Daily Load Profile



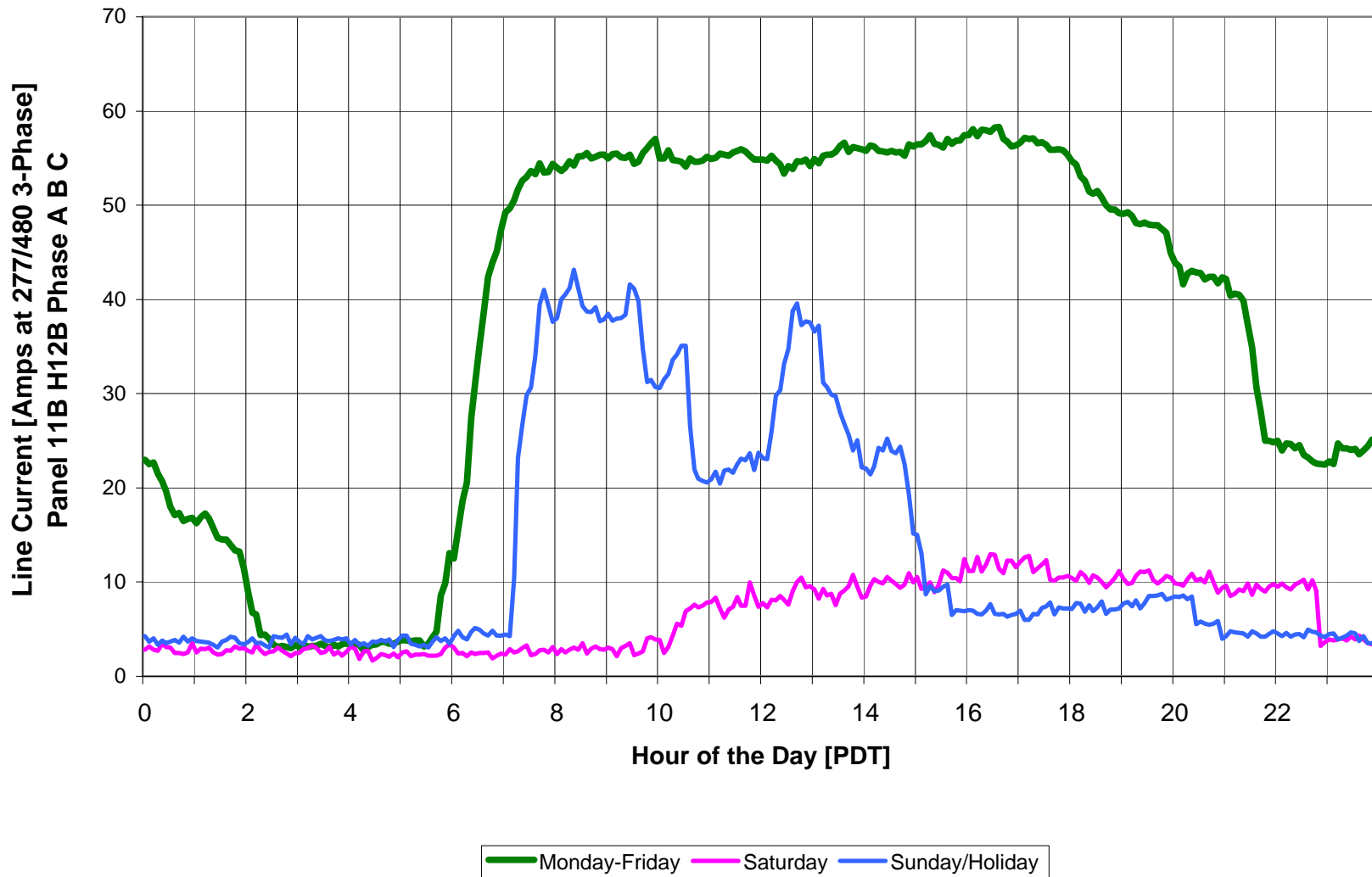
LA County Public Works October/November 2003
Basement Lights
Average Daily Load Profile



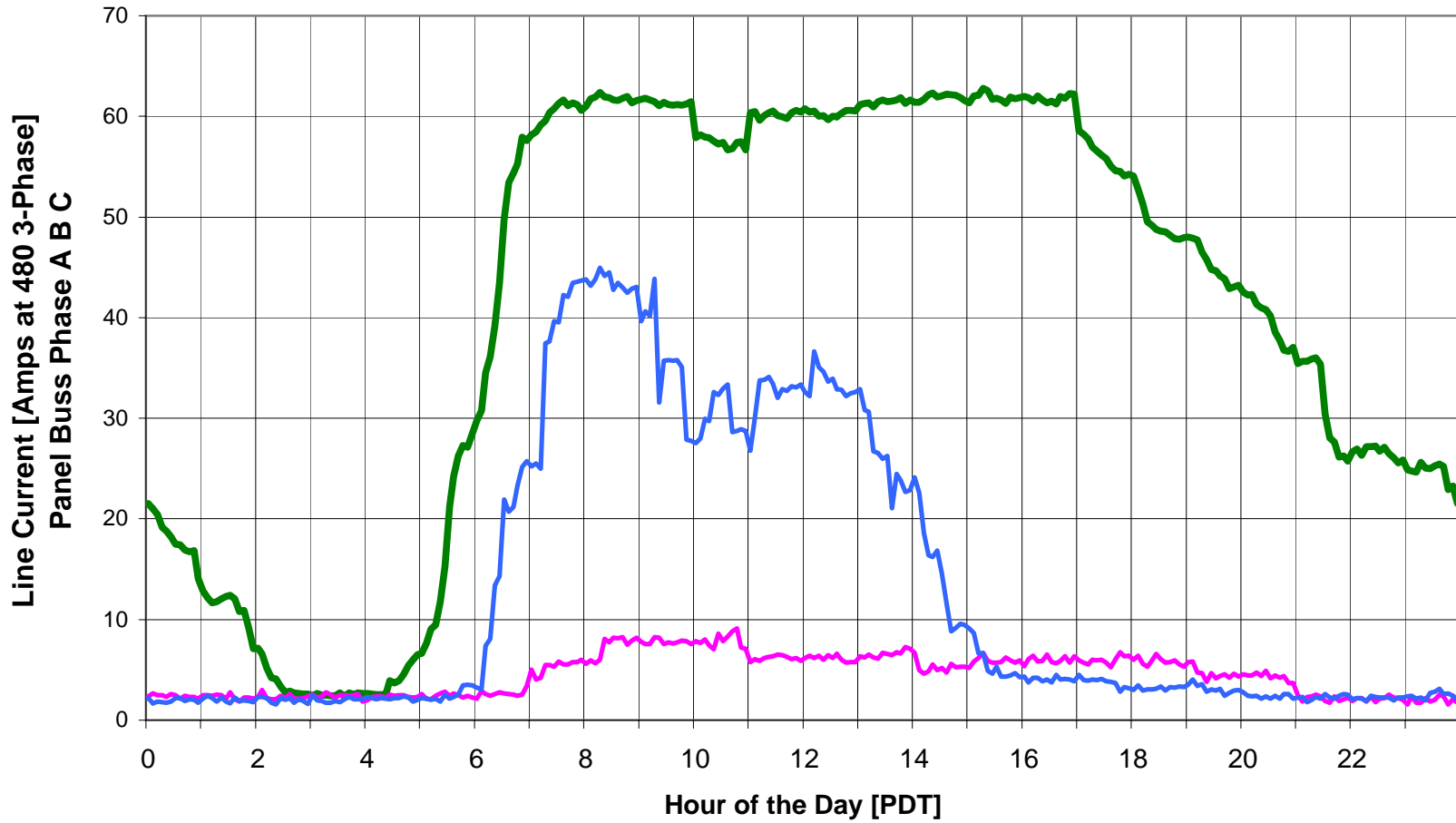
LA County Public Works Building March/April 2004
Basement Lights
Average Daily Load Profile



LA County Public Works October/November 2003
11TH and 12TH Floor Lights
Average Daily Load Profile

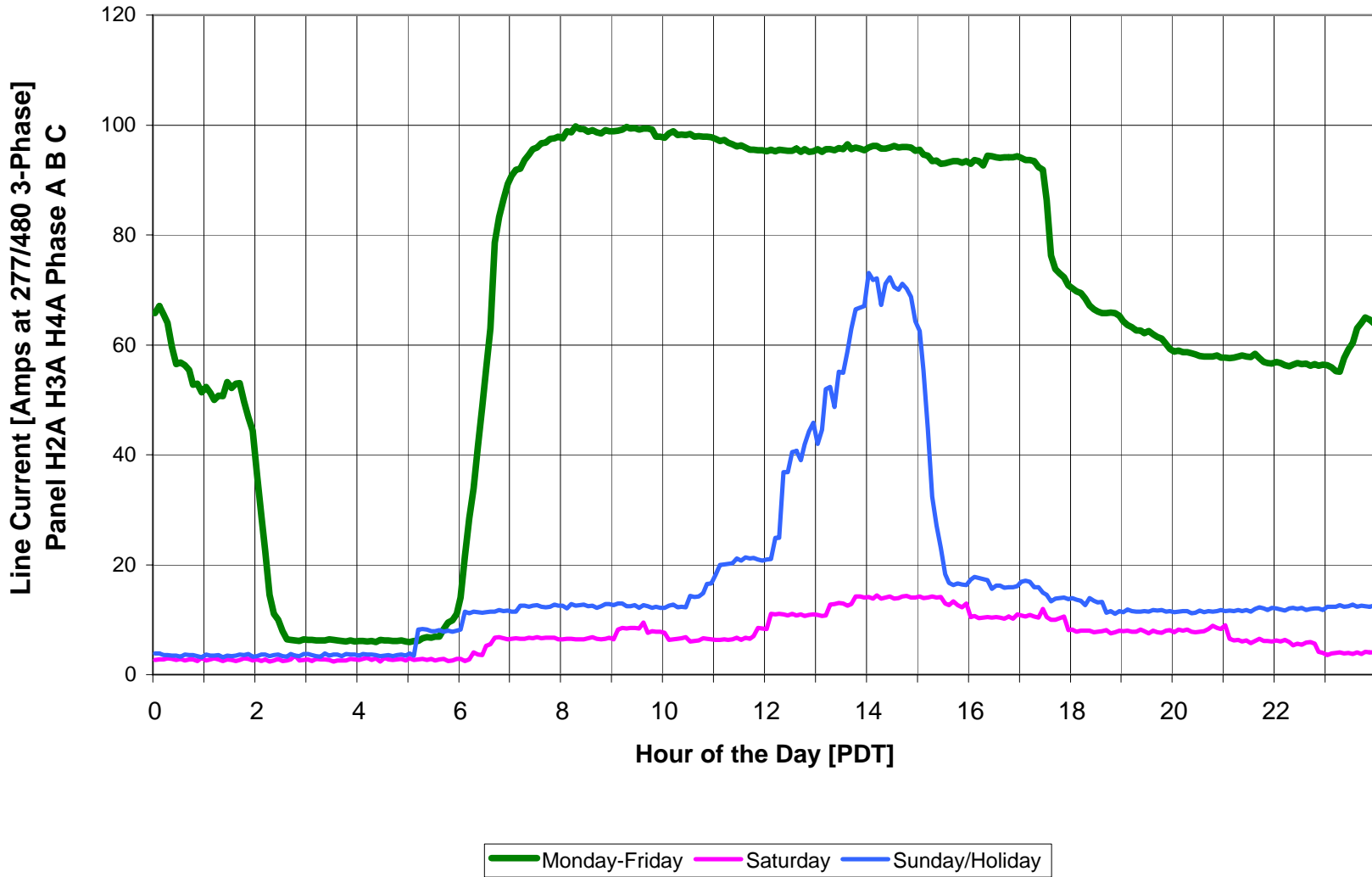


LA County Public Works Building March/April 2004
11th and 12th Floor Lighting
Average Daily Load Profile

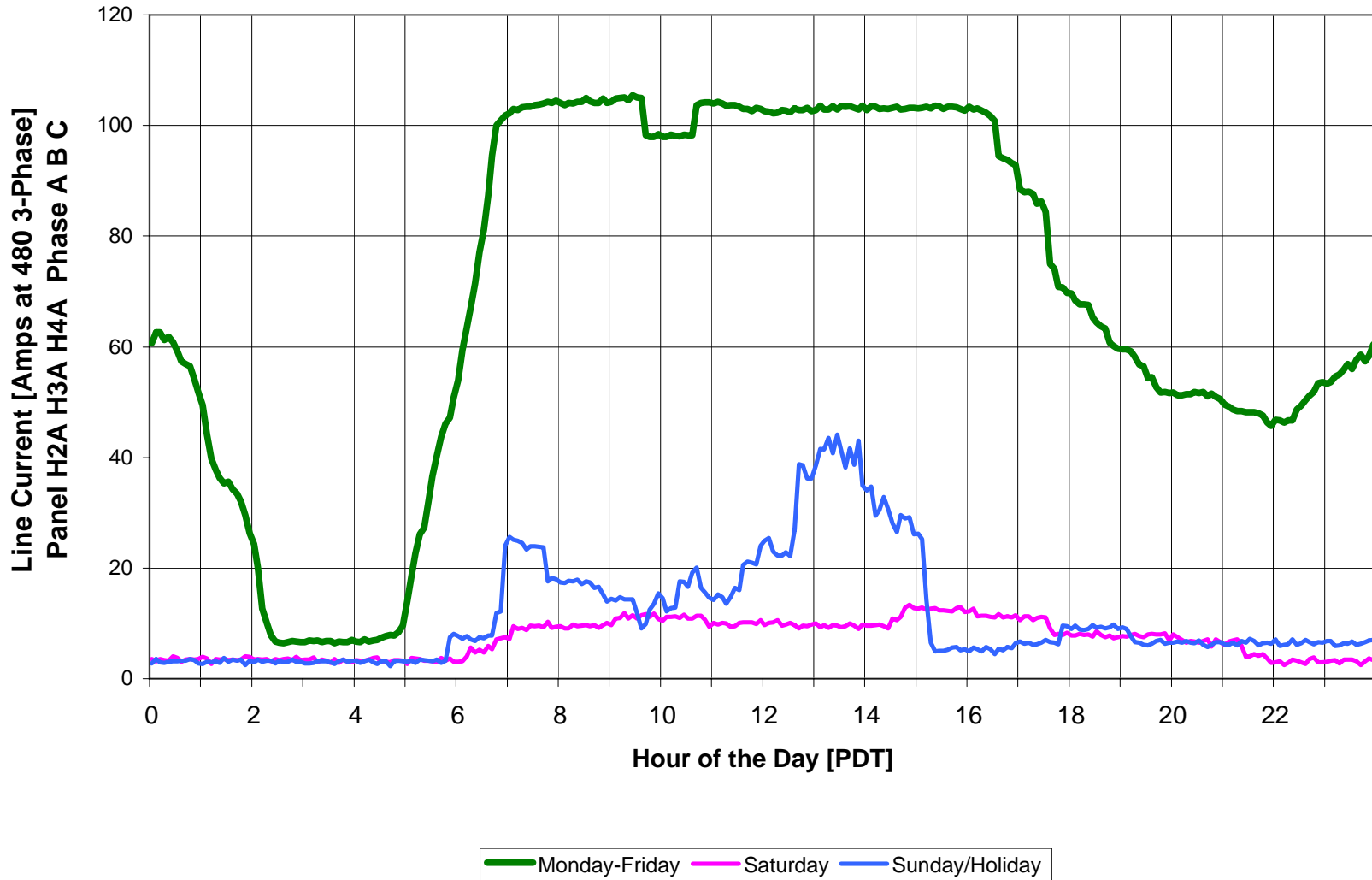


Monday-Friday Saturday Sunday/Holiday

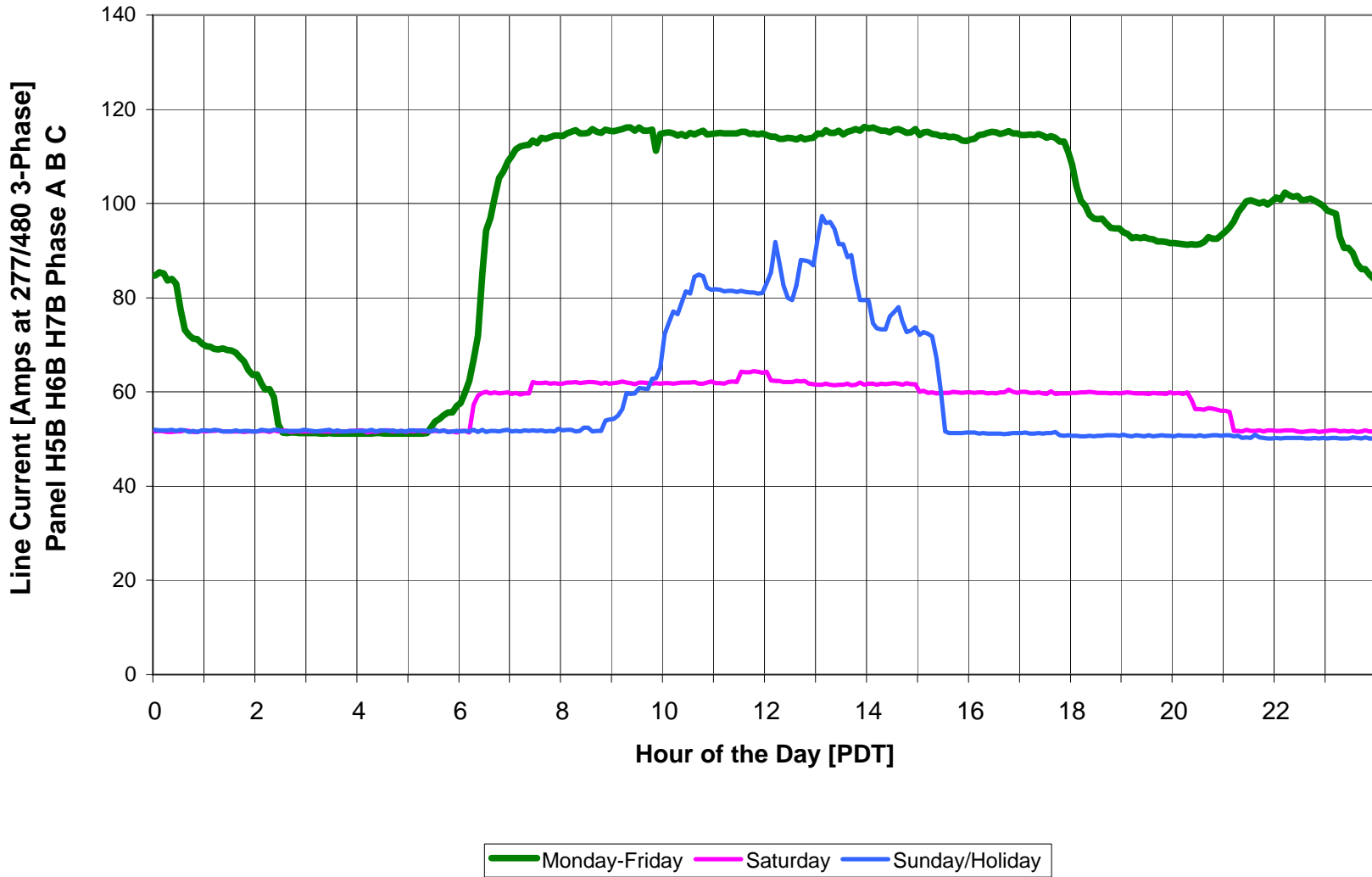
LA County Public Works October/November 2003
2ND 3RD 4TH Floor Lights
Average Daily Load Profile



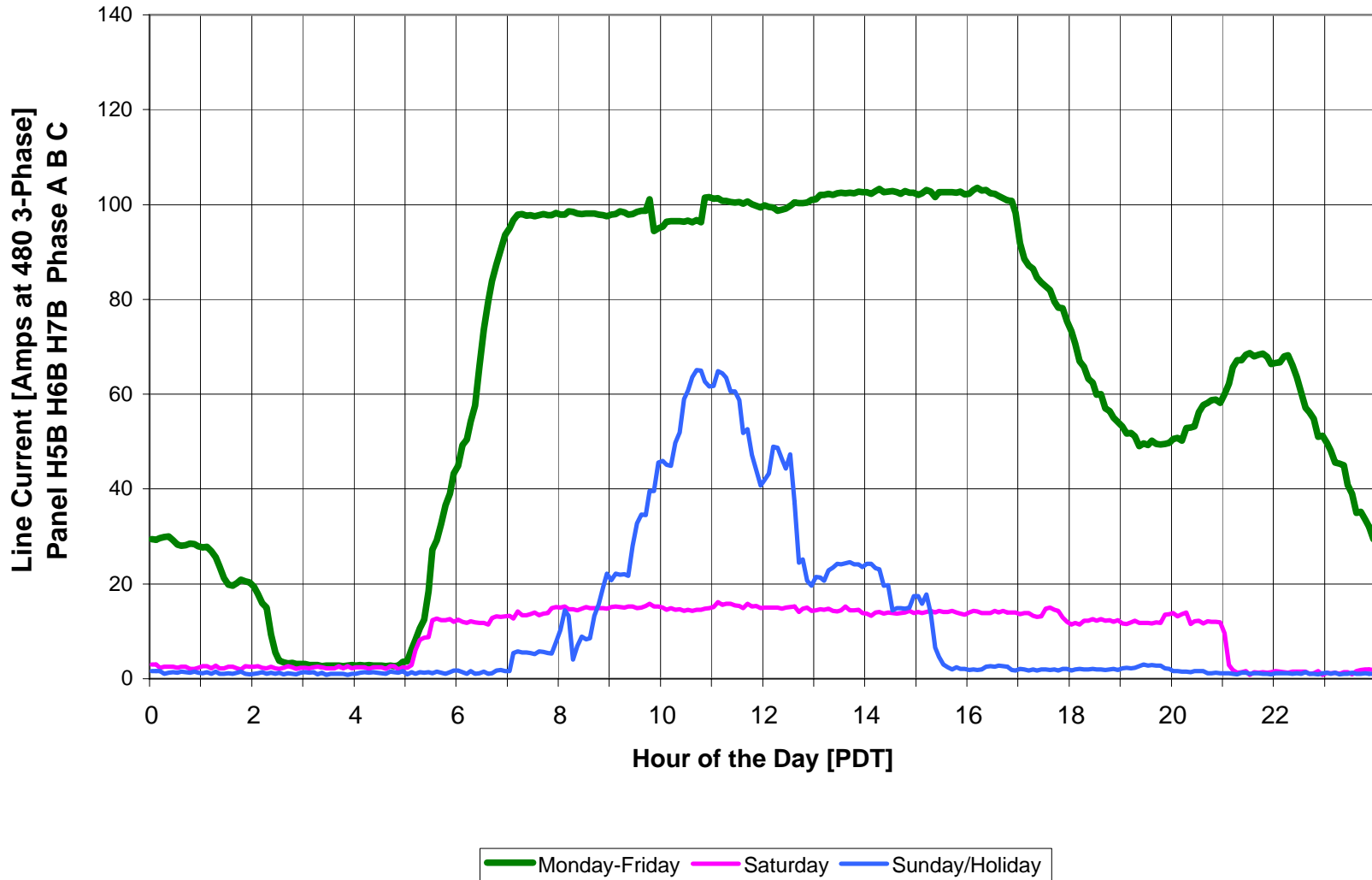
LA County Public Works Building March/April 2004
2nd, 3rd, and 4th Floor Lighting
Average Daily Load Profile



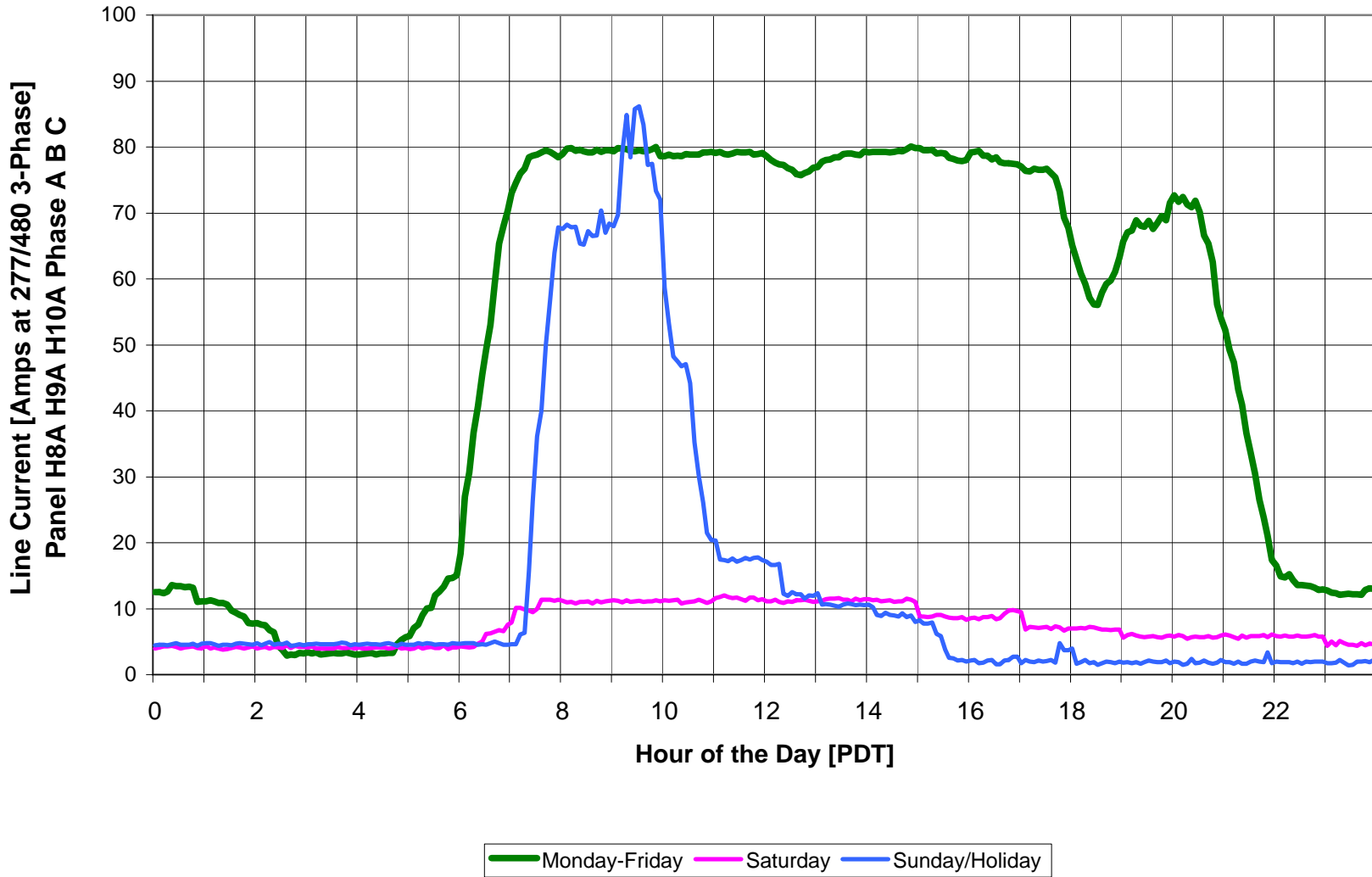
LA County Public Works October/November 2003
5TH 6TH 7TH Floor Lights
Average Daily Load Profile



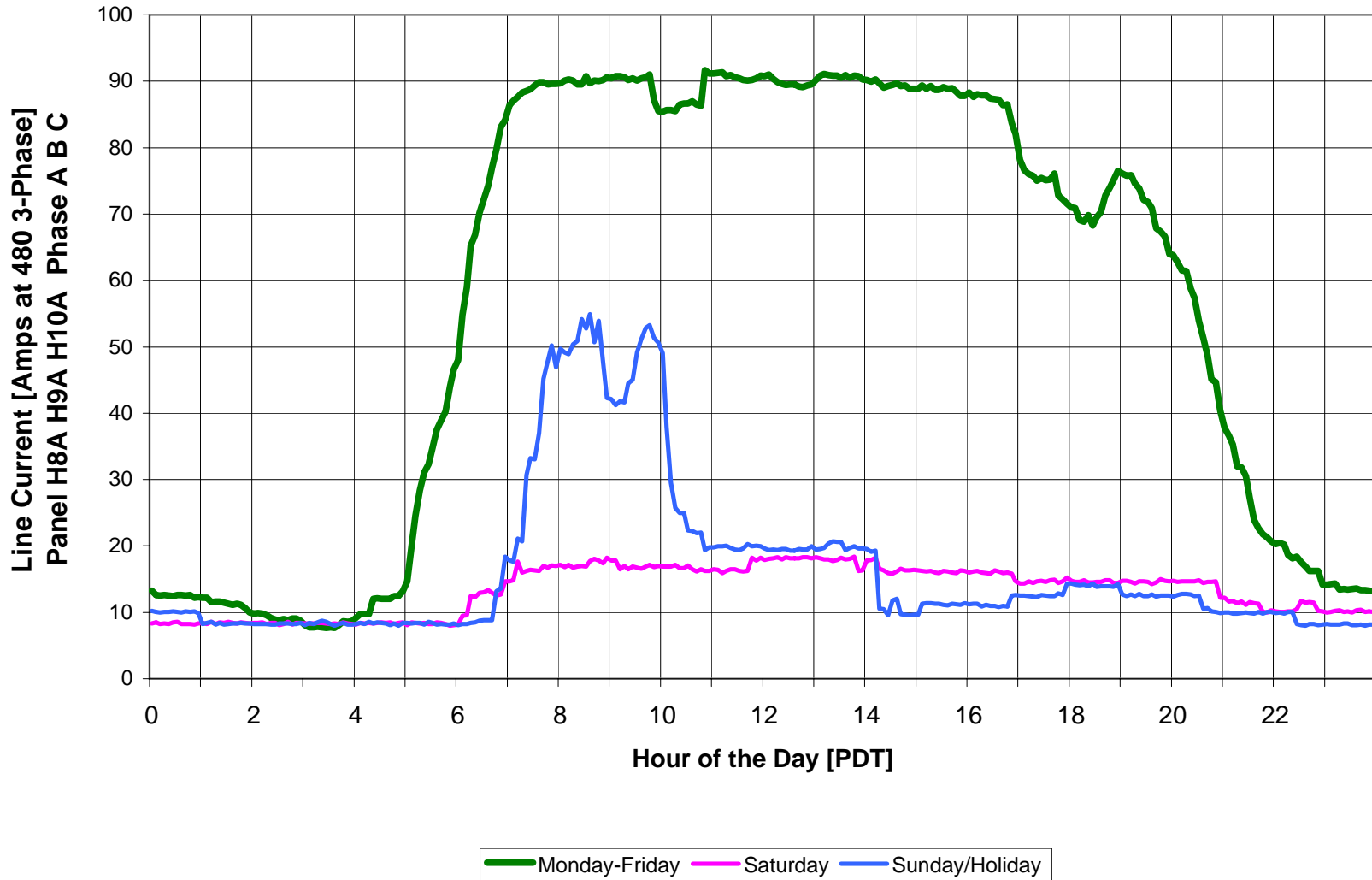
LA County Public Works Building March/April 2004
5th, 6th, and 7th Floor Lighting
Average Daily Load Profile



LA County Public Works October/November 2003
8TH 9TH and 10TH Floor Lights
Average Daily Load Profile



LA County Public Works Building March/April 2004
8th, 9th, and 10th Floor Lighting
Average Daily Load Profile





LA County CPUC Local Program #156-02
 Site 24A - Public Works, Alhambra Office Building

Basement circuit breaker feeding Panel HBA					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	15.80	4.33			
B	11.60	3.18			
C	3.00	0.82			
TOT/AVG	10.13	8.34			

Basement circuit breaker feeding Panel HBB					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	7.7	2.11			
B	8.60	2.36			
C	14.10	3.87			
TOT/AVG	10.13	8.34			

3rd Floor busway feeding panels H2B, H3B, & H4B (EAST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	21.46	5.91	5.87	0.91	0.99
B	42.39	11.50	11.70	1.76	0.99
C	45.90	12.40	12.60	2.08	0.99
TOT/AVG	36.58	29.81	30.17	4.75	0.99

3rd Floor busway feeding panels H2A, H3A, & H4A (WEST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	55.40	15.19			
B	31.80	8.72			
C	33.00	9.05			
TOT/AVG	40.07	32.96			



LA County CPUC Local Program #156-02
Site 24A - Public Works, Alhambra Office Building

6th Floor busway feeding panels H5B, H6B, & H7B (EAST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	32.50	8.91			
B	27.90	7.65			
C	49.30	13.52			
TOT/AVG	36.57	30.08			

6th Floor busway feeding panels H5A, H6A, & H7A (WEST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	35.00	9.60	9.71	1.51	0.99
B	37.15	10.10	10.20	1.58	0.99
C	40.22	10.90	11.00	1.59	0.99
TOT/AVG	37.46	30.60	30.91	4.68	0.99

8th Floor panel H8B (EAST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	19.92	5.32	5.39	9.40	0.99
B	7.38	2.01	2.04	0.34	0.99
C	11.95	3.21	3.28	0.70	0.98
TOT/AVG	13.08	10.54	10.71	10.44	0.99

9th Floor panel H9B (EAST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	12.95	3.50	3.54	0.54	0.99
B	8.37	2.29	2.31	0.28	0.99
C	13.52	3.66	3.71	0.61	0.99
TOT/AVG	11.61	9.45	9.56	1.43	0.99



LA County CPUC Local Program #156-02
Site 24A - Public Works, Alhambra Office Building

10th Floor panel H10B (EAST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	10.05	2.70	2.74	0.49	0.98
B	8.39	2.26	2.33	0.55	0.97
C	5.33	1.41	1.46	0.39	0.96
TOT/AVG	7.92	6.37	6.53	1.43	0.97

H8B, H9B, & H10B (East)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	42.92	11.52	11.67	10.43	0.99
B	24.14	6.56	8.06	1.17	0.99
C	30.80	8.28	8.45	1.70	0.98
TOT/AVG	32.62	26.36	28.18	13.30	0.99

9th Floor busway feeding panels H8A, H9A, & H10A (WEST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	34.20	9.38			
B	24.20	6.64			
C	38.60	10.59			
TOT/AVG	32.33	26.60			

12th Floor busway feeding panels H11B and H12B (EAST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	28.10	7.71			
B	30.40	8.34			
C	13.80	3.78			



LA County CPUC Local Program #156-02

Site 24A - Public Works, Alhambra Office Building

TOT/AVG	24.10	19.83			
---------	-------	-------	--	--	--

12th Floor busway feeding panels H11A and H12A (WEST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	19.68	5.39	5.43	0.81	0.99
B	27.92	7.56	7.68	1.31	0.99
C	19.50	5.31	5.44	0.85	0.99
TOT/AVG	22.37	18.26	18.55	2.97	0.99

Panels HMA, HGA COMBINED (Mezzanine WEST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	14.27	3.95	3.96	0.38	1.00
B	10.30	2.94	2.96	0.38	0.99
C	27.92	7.57	7.63	1.04	0.99
TOT/AVG	17.50	14.46	14.55	1.80	0.99

Panel HGA ALONE (Mezzanine WEST)					
Phase	Current	Real P [kW]	S [kVA]	Q [kVAR]	Pwr Fctr
A	4.18	1.14	1.16	0.17	0.99
B	6.05	1.63	1.65	0.28	0.99
C	13.07	3.51	3.57	0.65	0.98
TOT/AVG	7.77	6.28	6.38	1.10	0.99

Panel HGA is served from a breaker located in Panel HMA. We measured these panels both together and separately. Panel HGA has a larger than normal load on "C" phase

Site Measurement and Verification Report

Site Number 25

ISD Parking Lot

1100 N. Eastern Avenue, Los Angeles

SCE Account 3-000-0599-41

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	197,100 kWh
Contractor's As-Built Estimate	178,941 kWh
<i>Ex-Ante</i> Evaluation	203,260 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	178,941 kWh

Site Description

This location is the parking areas of the LA County ISD main offices, vehicle maintenance, shops, and other buildings in the ISD complex. The project consisted of replacing existing 1000W mercury vapor lamps with 400W metal halide pulse-start lamps.

Preliminary Site Visit

The site was visited on March 6, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. We were able to visibly verify and confirm the fixture count throughout the facility. No Discrepancies were discovered.

Post-Retrofit Audit

The site was again visited on November 20, 2003. We verified the retrofits and noticed no errors or discrepancies in the contractor's post retrofit count or description of the new fixtures.

Operating Hours

The parking lot lights operate from dawn to dusk. The contractor assumed 4,380 hours per year operation, and we concur that this is the proper estimate of operating time for this type of dusk-to-dawn operation. Numbers were not changed from the contractor's values, which explains why the contractor's energy savings estimate is the same as our *ex-post* calculation.

Energy Savings Calculations

The following table demonstrates the savings by type of fixture, in accordance with the fixture types established in the implementation plan and CPUC spreadsheets. The “contractor’s as-built” values are based upon the wattage and operating time estimates of the installation contractor. The Aloha *ex-ante* savings calculation is the quantity of each fixture type verified by Aloha Systems to be installed multiplied by the stipulated per-unit kWh savings in the CPUC spreadsheet. For the pulse-start HID lights at this site, the ex-ante average per-fixture savings was stated as 3,079.7 kWh/yr. The Aloha *ex-post* savings are derived from our estimates of operating times and fixture wattages.

The following table delineates the savings at this site for each of the measure types included in the program.

ISD Parking Lot Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
HID Retrofit	64	197,100	66	178,941	203,260	178,941
Exit Lights						
T12 to T8						
Inc to CFL						
Total	64	197,100	66	178,941	203,260	178,941

The contractor’s estimate and the ex-post calculation are identical because the contractor properly estimated fixture wattage changes and operating hours. The ex-ante estimate is higher than these because it assumed a slightly higher per-fixture annual energy savings (this was from a combination of longer operating hours [5470h] and a lower wattage reduction [563W] than at this particular site. The overall *ex-ante* savings at this site is higher than that proposed (197,100 kWh/yr) because 66 fixtures were actually installed, while the proposal delineated 64 fixtures.

Contractor As-Built Savings
25. ISD Parking Lot

		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
1	ISD Parking Lot	MV1000/1	Pole Head	1	1000W MV 480V	66	1075	70.95	4380	310,761	Timer / photo cell	Retrofit	MH400/1		1	400W MH pulse start lamp & 400W MH PS ballast	66	456	30.096	131,820	40.854	178,941
																Total HID	66				40.854	178,941
					Total	66		70.95		310,761						Total	66		30.096	131,821	40.854	178,941

Aloha Systems Measured Savings
25. ISD Parking Lot

		Existing Fixtures										New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
1	ISD Parking Lot	MV1000/1	Pole Head	1	1000W MV 480V	66	1,075	70.950	4,380	310,761	Timer / photo cell	Retrofit	MH400/1		1	400W MH pulse start lamp & 400W MH PS ballast	66	456	30.096	131,820	40.854	178,941		
																Total HID	66							
Total						66		70.95			310,761		Total						66		30.096	131,821	40.854	178,941

ISD Parking Lot – 1100 N. Eastern Ave



Parking Lot Lights



Parking Lot Lights (Closeup)

Site Measurement and Verification Report

Site Number 26

ISD Crafts Shop

1102 Eastern Avenue, Los Angeles

ISD Auto Shop

1104 Eastern Avenue, Los Angeles

ISD Warehouse

1110 Eastern Avenue, Los Angeles

Annual Energy Savings Estimates	
LA County CPUC Proposed Estimate	806,187 kWh
Contractor's As-Built Estimate	531,455 kWh
<i>Ex-Ante</i> Evaluation	817,822 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	811,932 kWh

Site Description

ISD Auto Repair Shop and Complex Crafts Shop are located in the same lot. The Auto Repair Shop is a garage where they repair police and other L.A. County vehicles. In front of the Auto Repair Shop is the Complex Crafts Shop. This area is made up of large open work areas, offices and material storage areas. It is a single-story, warehouse style building used for a variety of trades and crafts personnel for the County of Los Angeles. Differing trades such as the welding department divide the building. It also contains a main warehouse that receives and stores materials such as plumbing supplies on racks out in the main warehouse area.

The warehouse is a portion of the building located at 1110 Eastern Avenue. The office areas of this building were not included in the retrofit.

Spreadsheet Errors

Changes made as a result of correcting the contractor's spreadsheet errors are highlighted in lavender on Aloha's "metered" spreadsheet. If the total kWh savings changed for a given row, it was also highlighted. Only rows with highlighted final columns affected the total value in the contractor's as-built spreadsheet.

Preliminary Site Visit

Crafts Shop

The site was visited on August 6, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. All of the existing fixtures are 400-watt metal halide fixtures that are all on during normal business hours.

One spreadsheet error was discovered. Total connected load shown was significantly lower than the product of the fixture quantity and the per-unit fixture wattage. This caused an underestimate in the contractor's savings calculations. The values were corrected on the "measured" spreadsheet.

Automotive Repair and Maintenance

The site was visited on August 6, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. Ballast type, lamp wattage, and lamp-per-fixture values were found to be accurate as described on the spreadsheets. All of the existing fixtures are 400-watt metal halide fixtures. No discrepancies were discovered.

Warehouse

The site was visited on December 11, 2003. During the visit existing lighting was observed and compared with the proposed retrofit plans. This site was added to the scope of the project because funds were still available. The plan was to replace the 65 existing mercury vapor lamps with 44 T5 fluorescent fixtures. The fixtures were not planned to be one-for-one replacements.

We observed ten rows of six lights and one row of five lights, accounting for the 65 one-lamp fixtures. Thirty-one were 400W mercury vapor lamps and thirty-four were 175W mercury vapor lamps.

The contractor's spreadsheet listed sixty-six 175W metal halide fixtures. Although this listed one more original fixture than we found, more importantly it underestimated the pre-retrofit energy consumption because of its failure to list the 400W fixtures. We corrected this problem by separating the spreadsheet into two line items. No attempt was made to match pre- and post-retrofit fixtures on a line item basis because they were not direct replacements in any way. These changes are highlighted in lavender.

Post-Retrofit Audit

Crafts Shop

This site was visited again on November 20, 2003. We verified the retrofits. Forty-four of the 218 fixtures were replaced with 6-lamp T5 fixtures rather than the 4-lamp fixtures specified. This discrepancy was handled by adding an extra row on the “measured” spreadsheet and dividing the fixture quantities appropriately.

Automotive Repair and Maintenance

The site was also visited again on November 20, 2003. We verified the retrofits and noticed no errors or discrepancies in the contractor’s post retrofit count or description of the new fixtures.

Warehouse

This site was visited again on March 23, 2004. We verified the retrofits. Forty-four T5 fixtures had been installed.

Metered Load Profiles

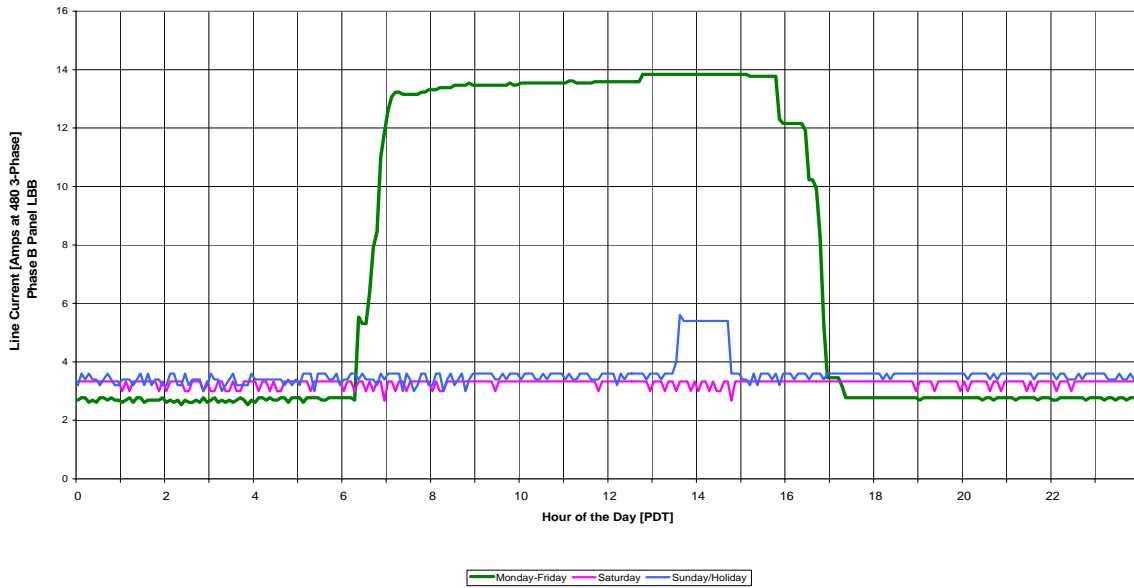
Because both of the facilities at 1102 and 1104 Eastern Avenue have wide-open areas with similar operating conditions, we were able to monitor several panels in each building and obtained an accurate description of the operating behavior for each building.

Crafts Shop

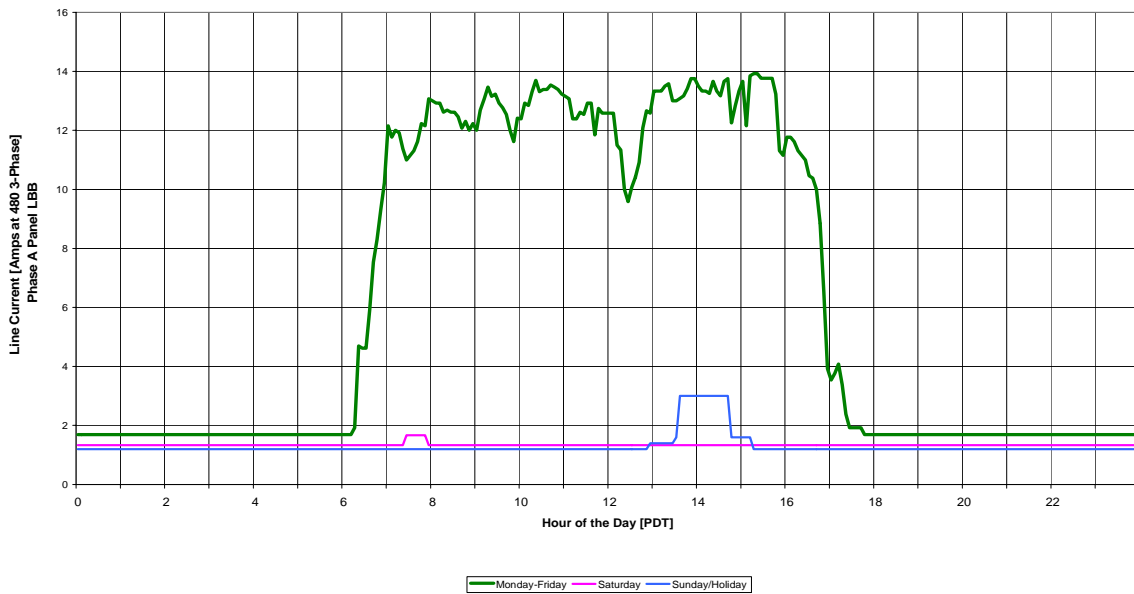
We collected interval data for lighting loads in the sheet metal shop and the machine shop.

Sheet Metal Shop: The sheet metal shop was chosen because of the large quantities of retrofitted fixtures. Two dataloggers were installed to take measurements and information on lighting usage of the sheet metal shop. The data from the load profile shows that the lights are on from about 6:30 a.m. to about 5:00 p.m. Both loggers represented approximately the same number of lights. One demonstrated more aggressive shut-down during lunch periods, and the other had a higher proportion of night lights. The full load operating times of the two loggers were 3,787 hours per year and 2,982 hours per year.

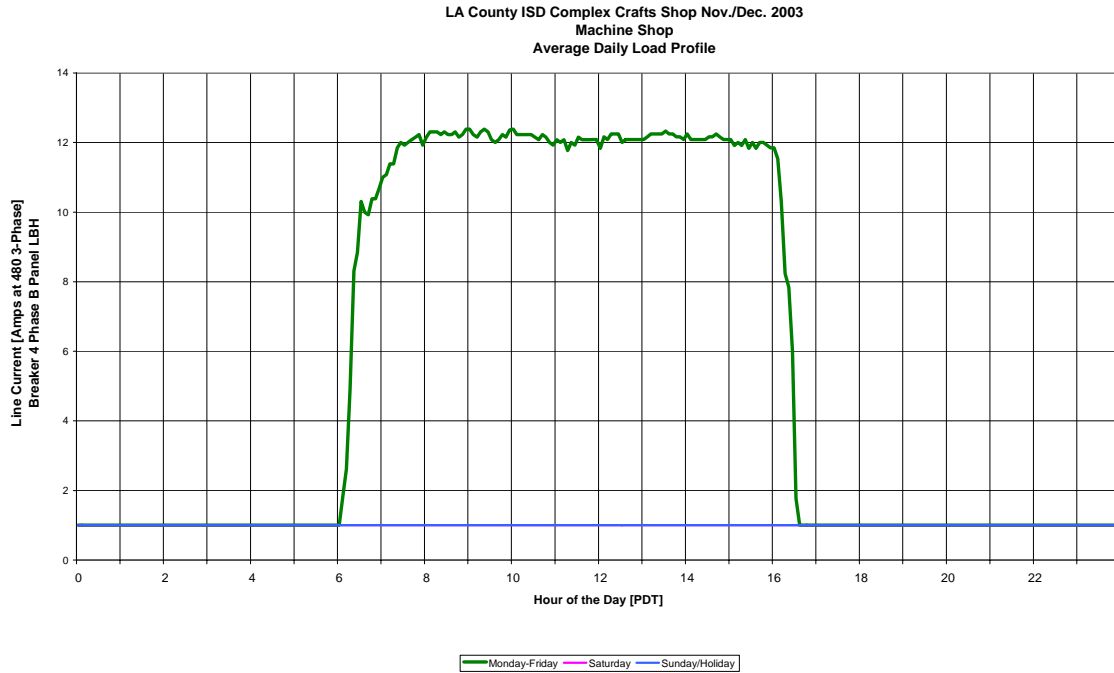
LA County ISD Complex Crafts Shop Nov./Dec. 2003
 Sheet Metal Shop Lights
 Average Daily Load Profile



LA County ISD Complex Crafts Shop Nov./Dec. 2003
 Sheet Metal Shop
 Average Daily Load Profile



Machine Shop: The machine shop was also chosen because of the large quantities of retrofitted fixtures. Two dataloggers were installed to verify the lighting usage. The load profiles result shows that lights are on from about 6:30 a.m. until 4:30 p.m. The load profiles were similar and represented 2,976 and 3,099 hours per year.



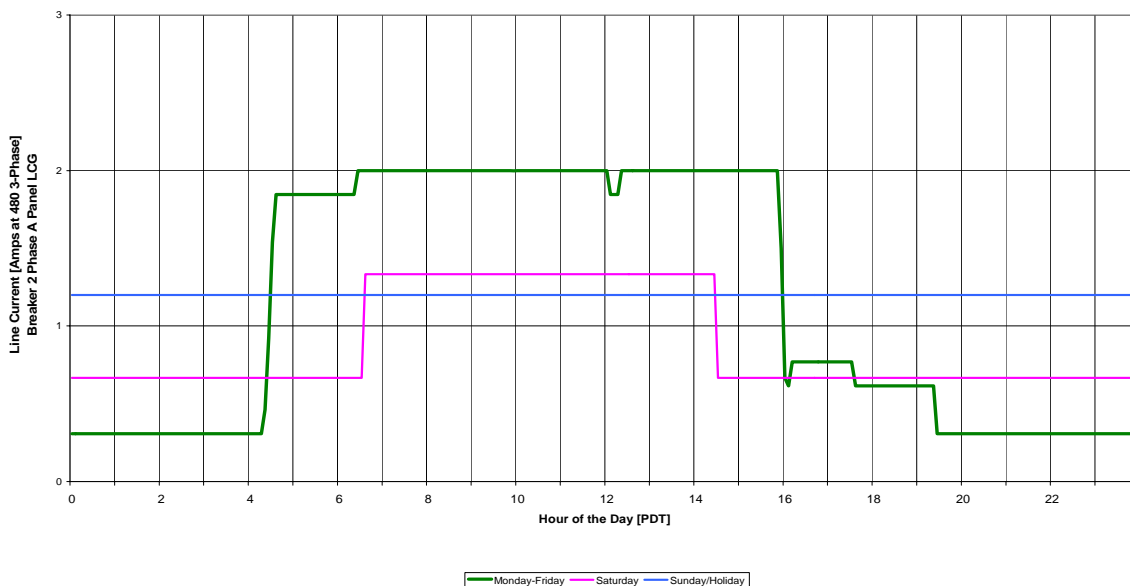
The contractor’s spreadsheet did not distinguish between the various shop locations within the Crafts Shop facility. The four load profiles collected represented approximately equivalent lighting loads. We therefore used the average of their equivalent operating hours – 3,211 hours per year – to represent all of the lights in the facility. This is significantly longer than the 2,470 h/yr assumed by the contractor.

Automotive Repair and Maintenance

We collected interval data for lighting loads the paint shop and the main garage.

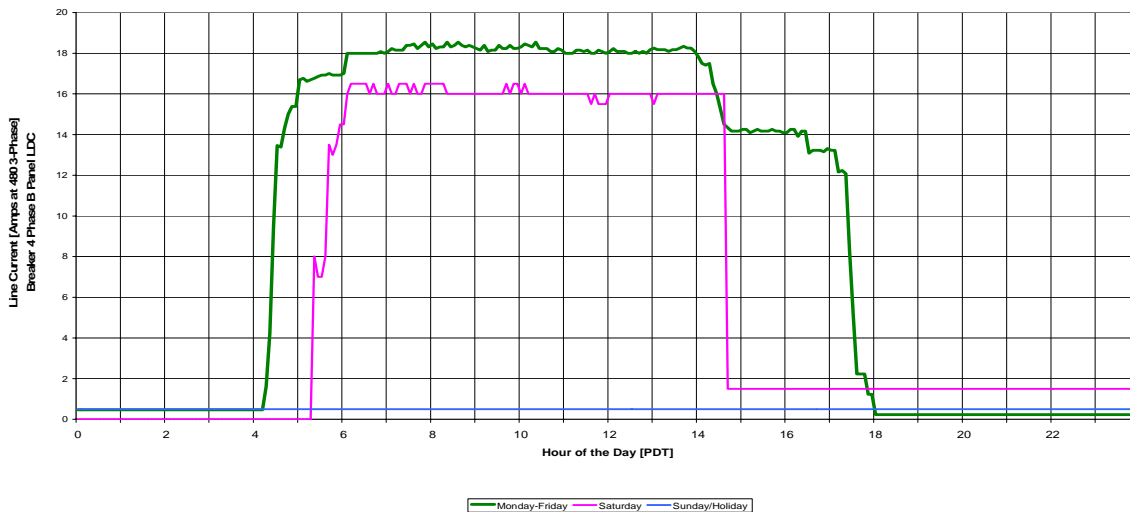
Paint Shop: The paint shop was chosen to illustrate the overall lighting operation behavior of the automotive repair facility with the exception of the main garage. The load profile representing the paint shop shows that lights are turned on at about 4:30 a.m. and stay on until about 4:00 p.m. During Saturdays the lights are on from about 6:30 a.m. to 2:30 p.m. The lights were also left on continuously over the Thanksgiving holiday weekend. The full load equivalent operating time is 4933 hours per year.

LA County ISD Auto Repair Shop Nov./Dec. 2003
Auto Paintshop
Average Daily Load Profile



Main Garage: The main garage was chosen because of its abnormal operation as compared to the rest of the facility. Two dataloggers were installed to measure the current and represent the lighting in the main garage. Both dataloggers showed that the lights are on from about 5:30 a.m. to 5:30 p.m. during the week and 6:00 a.m. to 2:00 p.m. on Saturdays. The lights did not operate at all over the Thanksgiving holiday. The full load equivalent operating times for the two dataloggers were similar, and the average is 3,571 hours per year. This value was used to represent the lights in this area, and is significantly greater than the 2,470 h/yr assumed by the contractor.

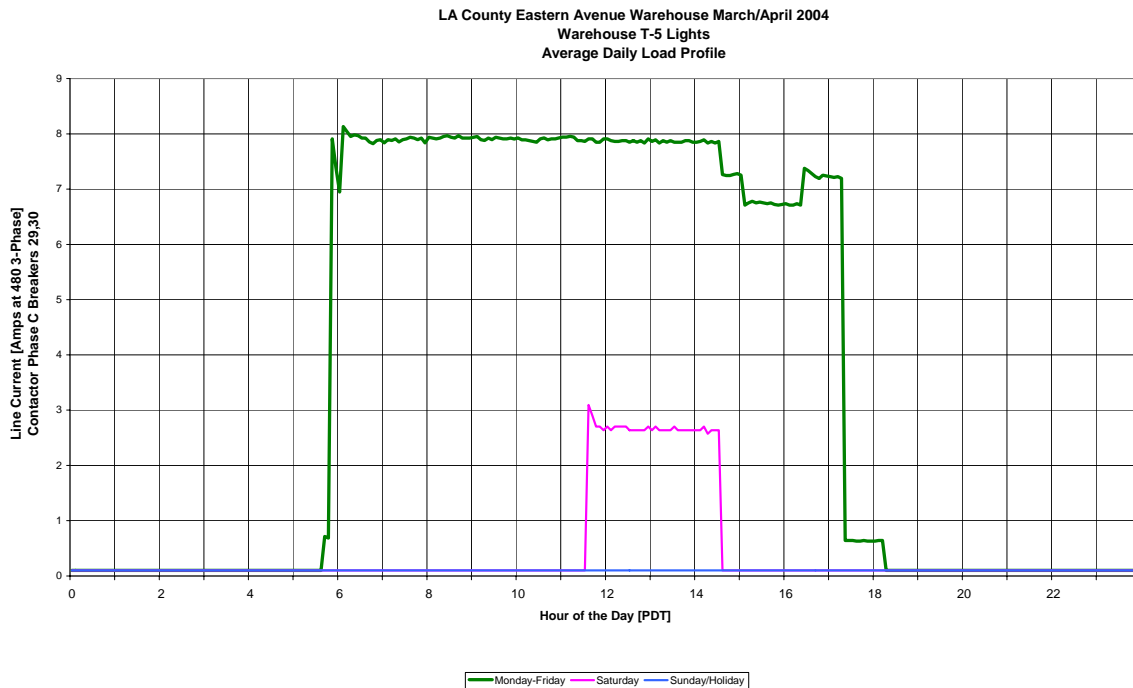
LA County ISD Auto Repair Shop Nov./Dec. 2003
Main Garage Lights
Average Daily Load Profile



Warehouse

We collected interval data for lighting loads in the warehouse. Three dataloggers were installed on various lighting circuits, including the circuit supposed to be the “emergency” circuit. This circuit appeared to be controlled by the same contactors as the other lights. The load profiles collected for each of these lighting circuits were very similar and produced approximately the same equivalent annual operating hours. (The lights are controlled by a bank of switches that theoretically allowed portions of the lights to be turned on while others remained off, but this did not frequently, if ever, happen.)

The following load profile, for circuits 29 and 30, is typical and shows operation from 6:00 a.m. until shortly after 5:00 p.m. Occasionally lights were shut down on Friday afternoons, accounting for the afternoon dip in the weekday profile. The lights were also used on one of the three Saturdays in the monitoring period. The average equivalent operating time for the warehouse lights is 2,951 hours per year. This is somewhat greater than the 2470 value assumed by the contractor. The 2951 value was used for all of the 1110 Eastern Avenue warehouse lights.



Energy Savings Calculations

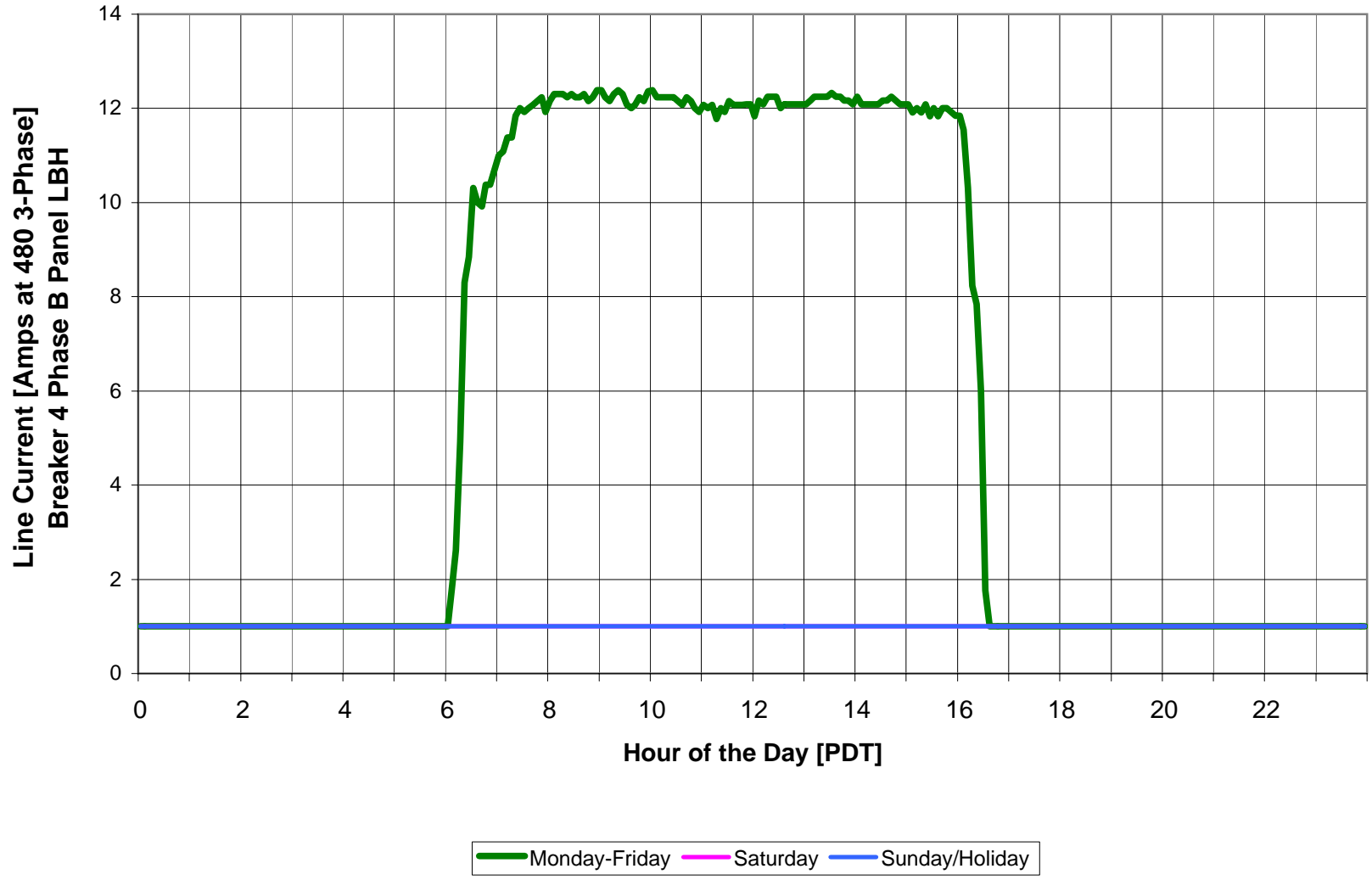
The following table demonstrates the savings of the T5 fluorescent fixtures installed at the three facilities in the ISD Eastern Avenue complex. The contractor’s spreadsheet savings calculations are low because of the several spreadsheet errors described above. The *ex-ante* savings is based upon the proposal to save 806,187 kWh per year by installing 970 fixtures. Since 984 fixtures were actually installed, the *ex-ante* savings are 817,822 kWh per year.

The *ex-post* figure, 811,932 kWh per year, is very close to the *ex-ante* savings value. This indicates that the county accurately estimated savings when it prepared and submitted the proposal revision.

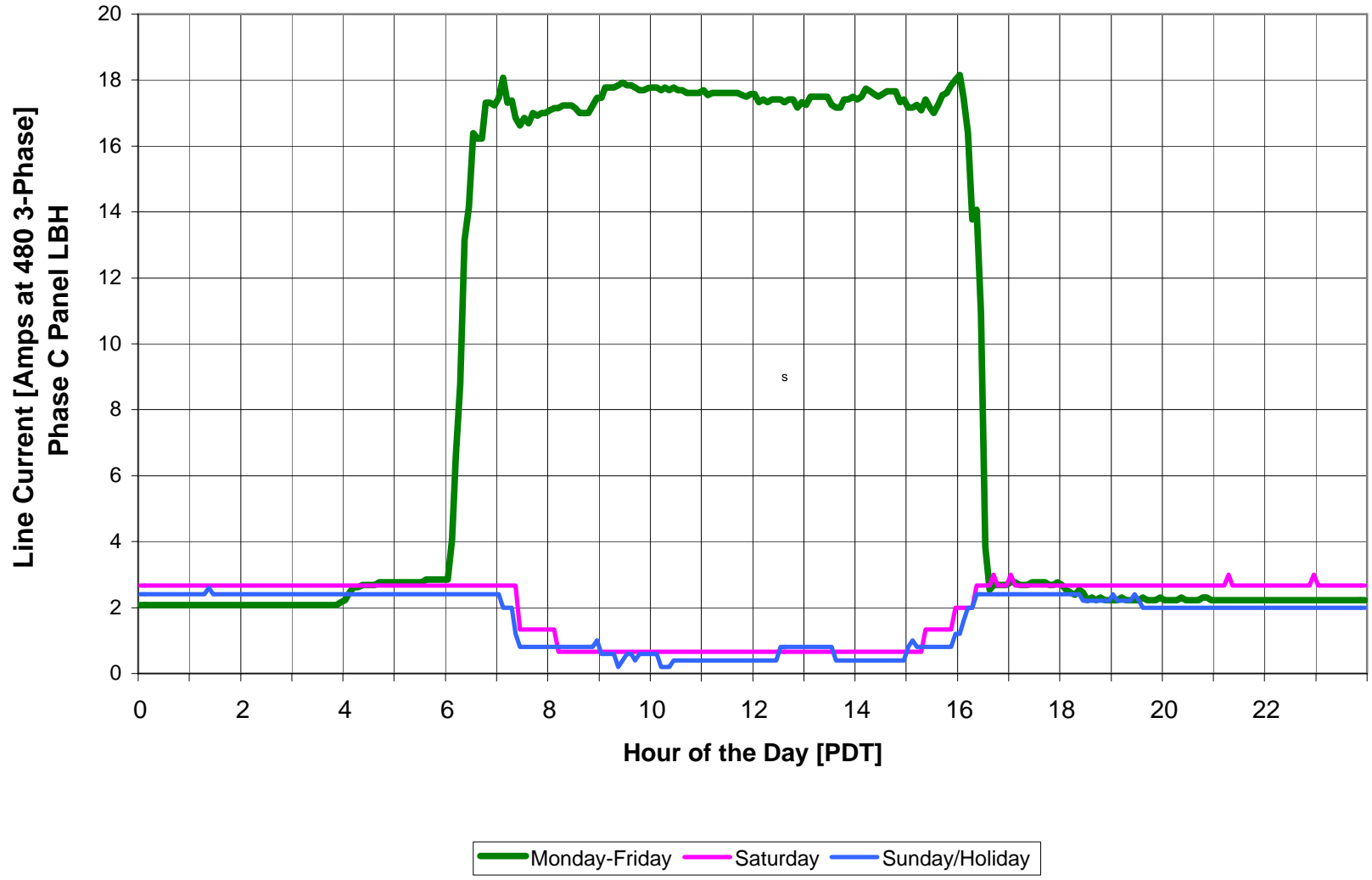
ISD Eastern Avenue Complex HID to T5 Retrofit Annual kWh Savings						
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Contractor As-Built Savings	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
1102 Crafts Shop			218	118,402	181,184	141,541
1104 Auto Repair			722	399,468	600,069	630,921
1110 Warehouse			44	13,585	36,569	39,470
Total	970	806,187	984	531,455	817,822	811,932

The full-page load profiles and detailed fixture spreadsheets follow this narrative.

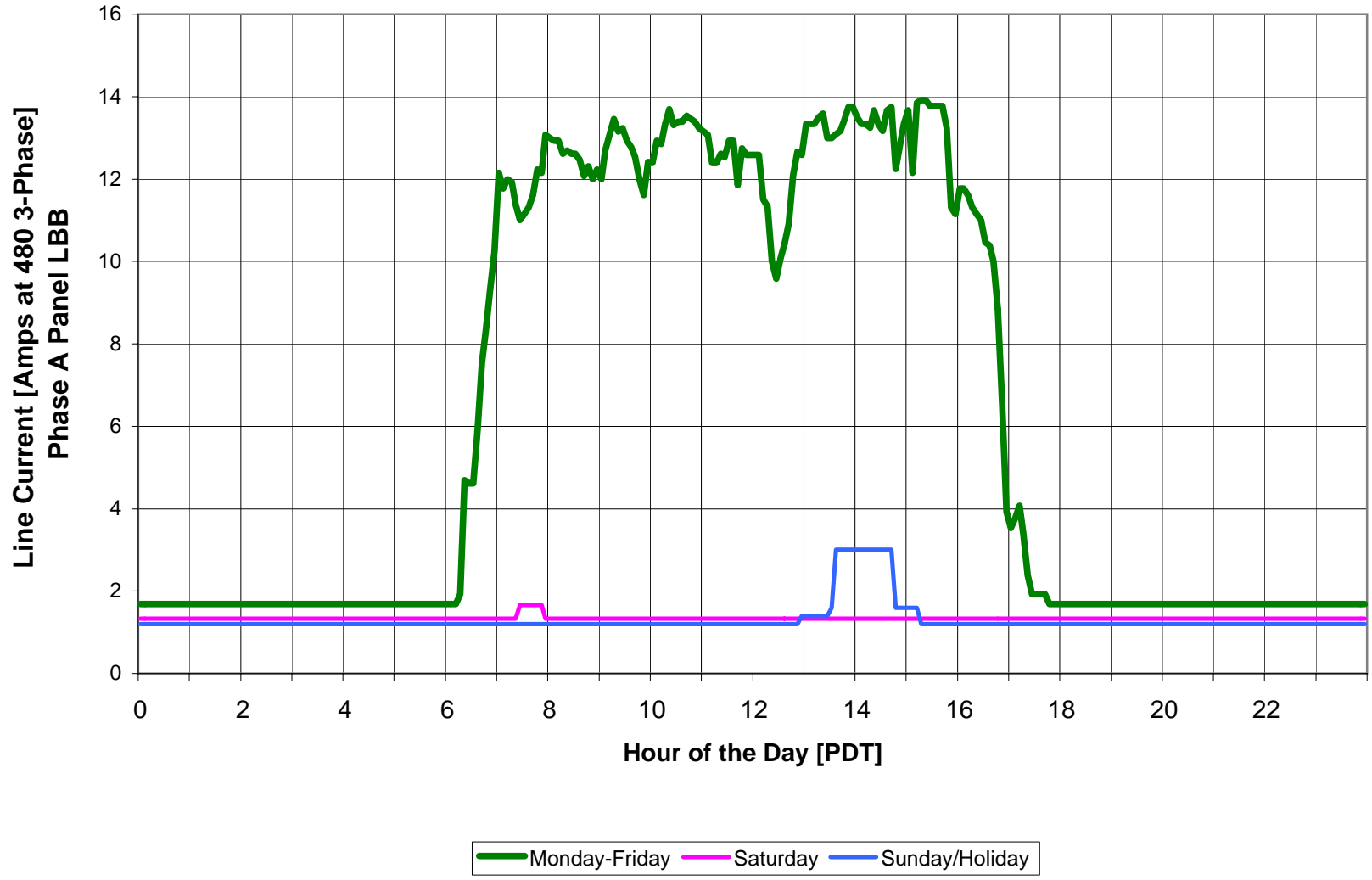
LA County ISD Complex Crafts Shop Nov./Dec. 2003
Machine Shop
Average Daily Load Profile



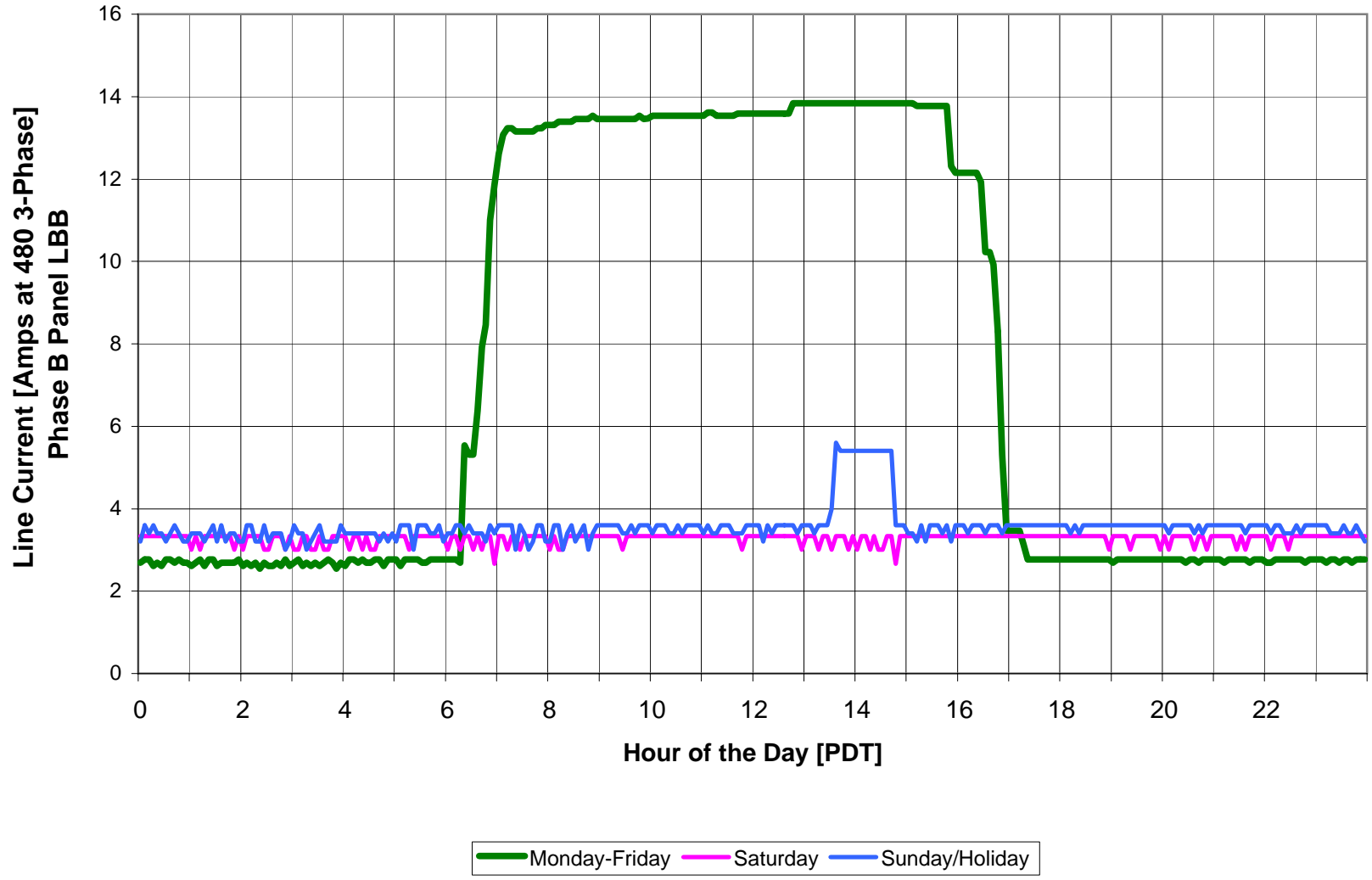
LA County ISD Complex Crafts Shop Nov./Dec. 2003
Machine Shop
Average Daily Load Profile



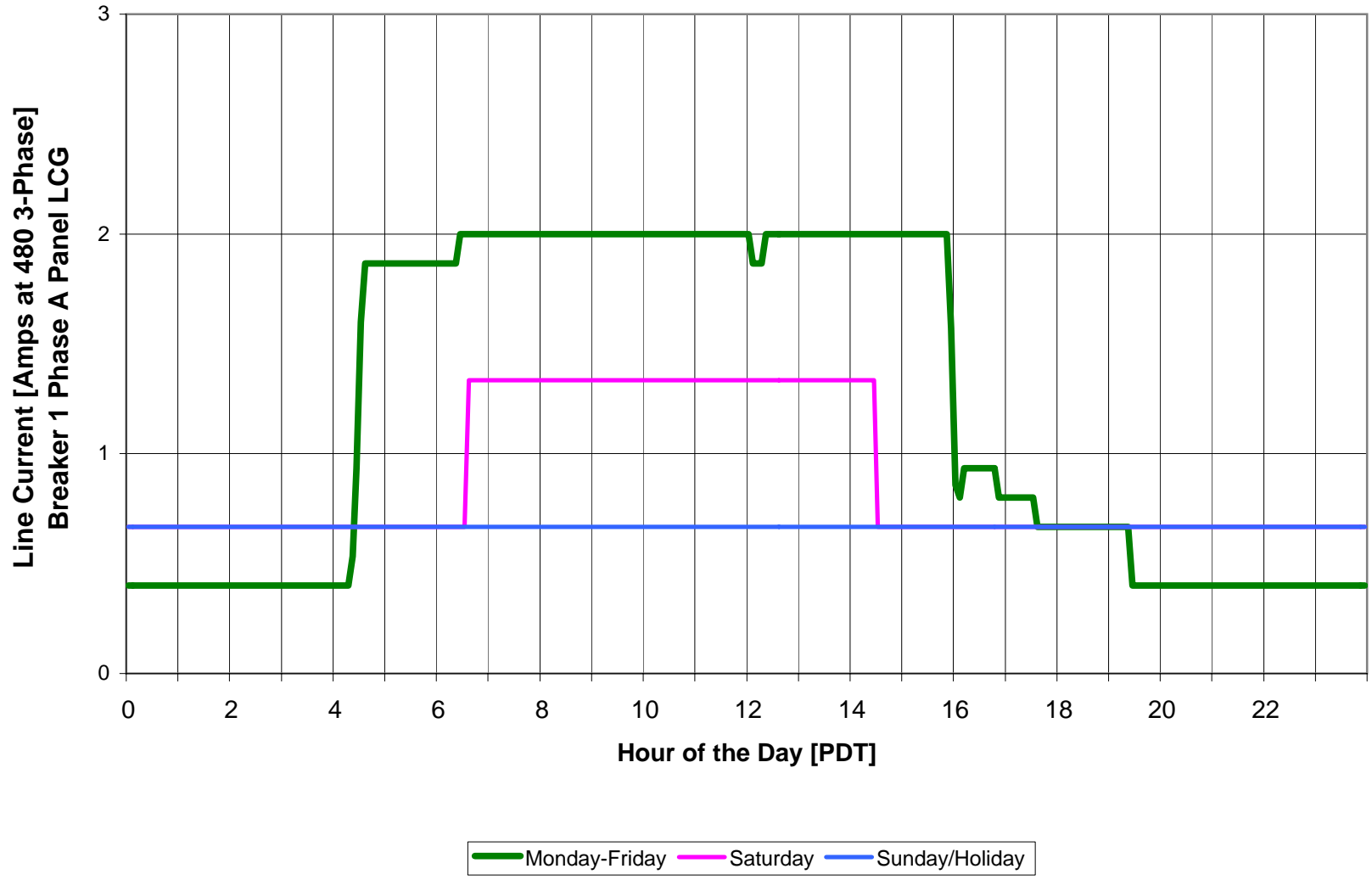
LA County ISD Complex Crafts Shop Nov./Dec. 2003
Sheet Metal Shop
Average Daily Load Profile



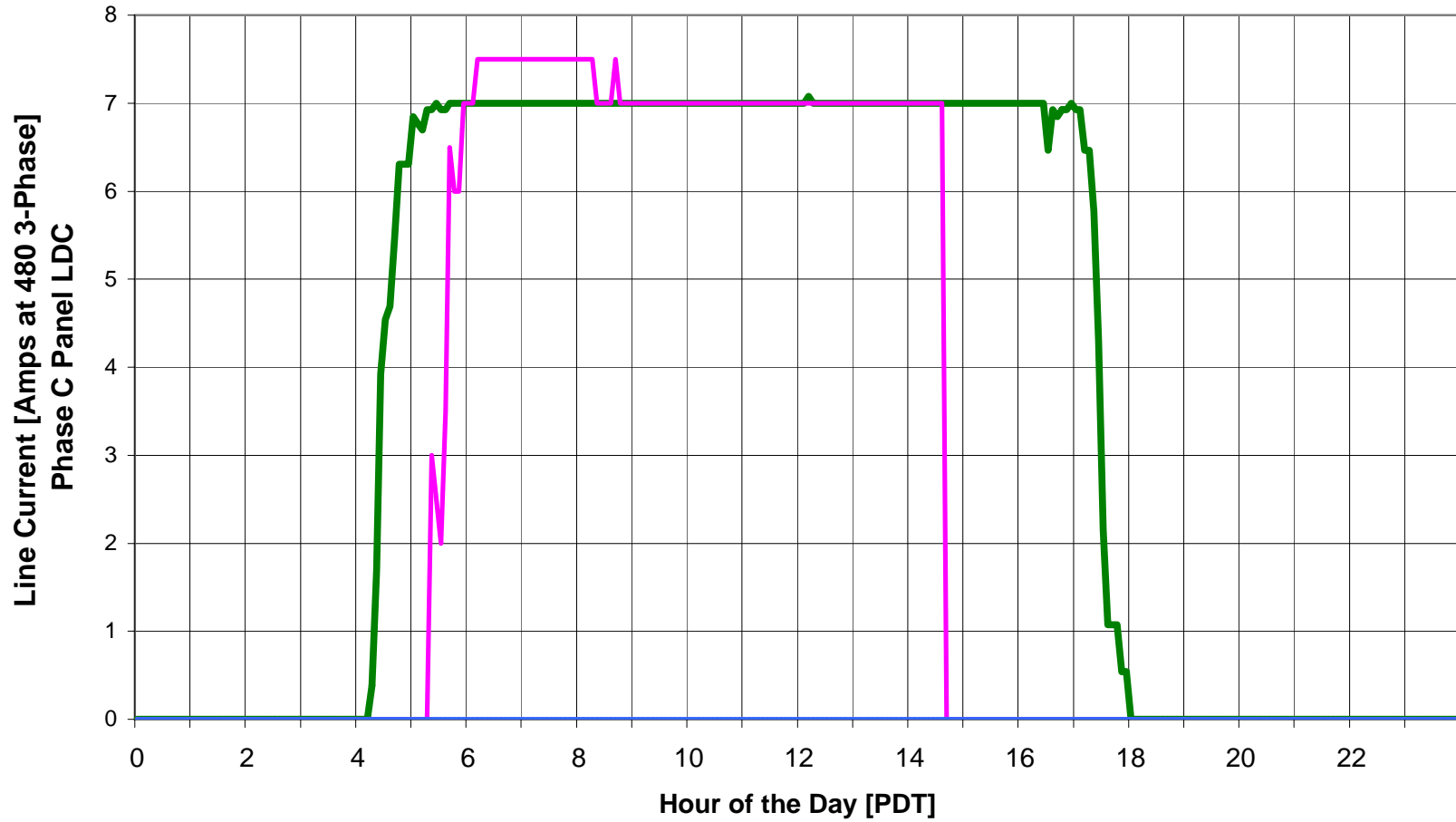
LA County ISD Complex Crafts Shop Nov./Dec. 2003
Sheet Metal Shop Lights
Average Daily Load Profile



LA County ISD Auto Repair Shop Nov./Dec. 2003
3 Fixtures with 4 lamps
Average Daily Load Profile

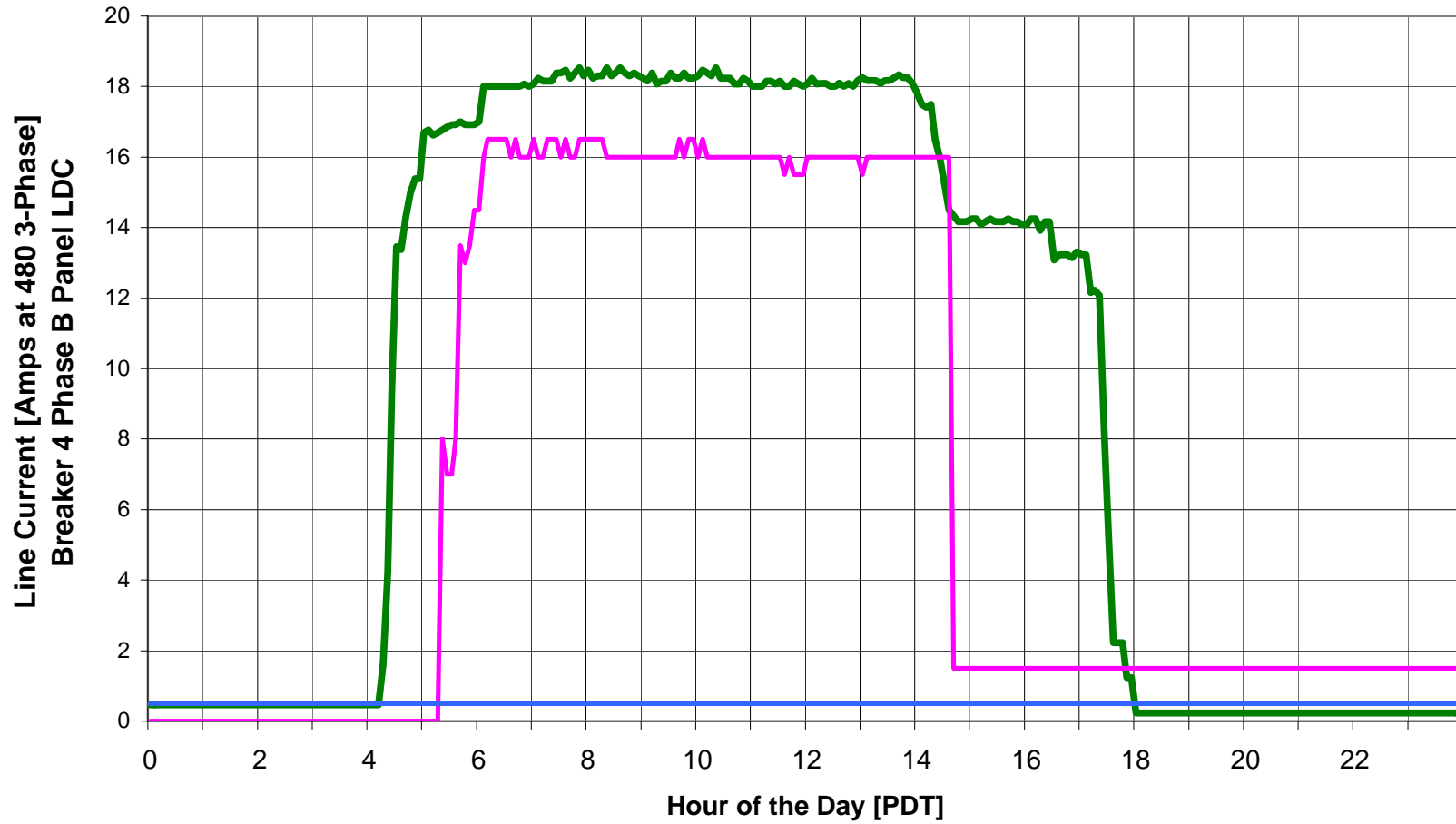


LA County ISD Auto Repair Shop Nov./Dec. 2003
Main Garage Lights
Average Daily Load Profile



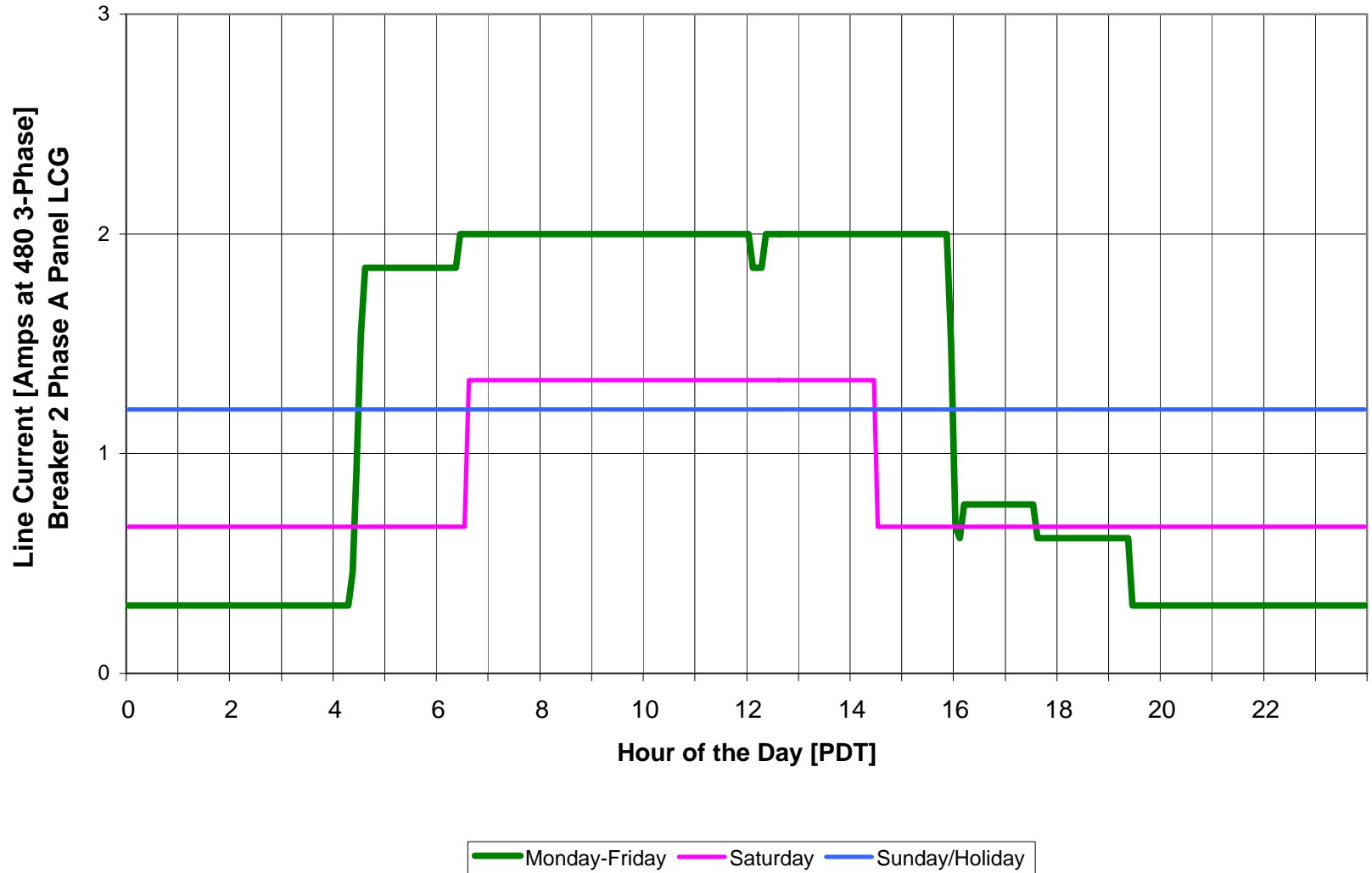
Monday-Friday Saturday Sunday/Holiday

LA County ISD Auto Repair Shop Nov./Dec. 2003
Main Garage Lights
Average Daily Load Profile

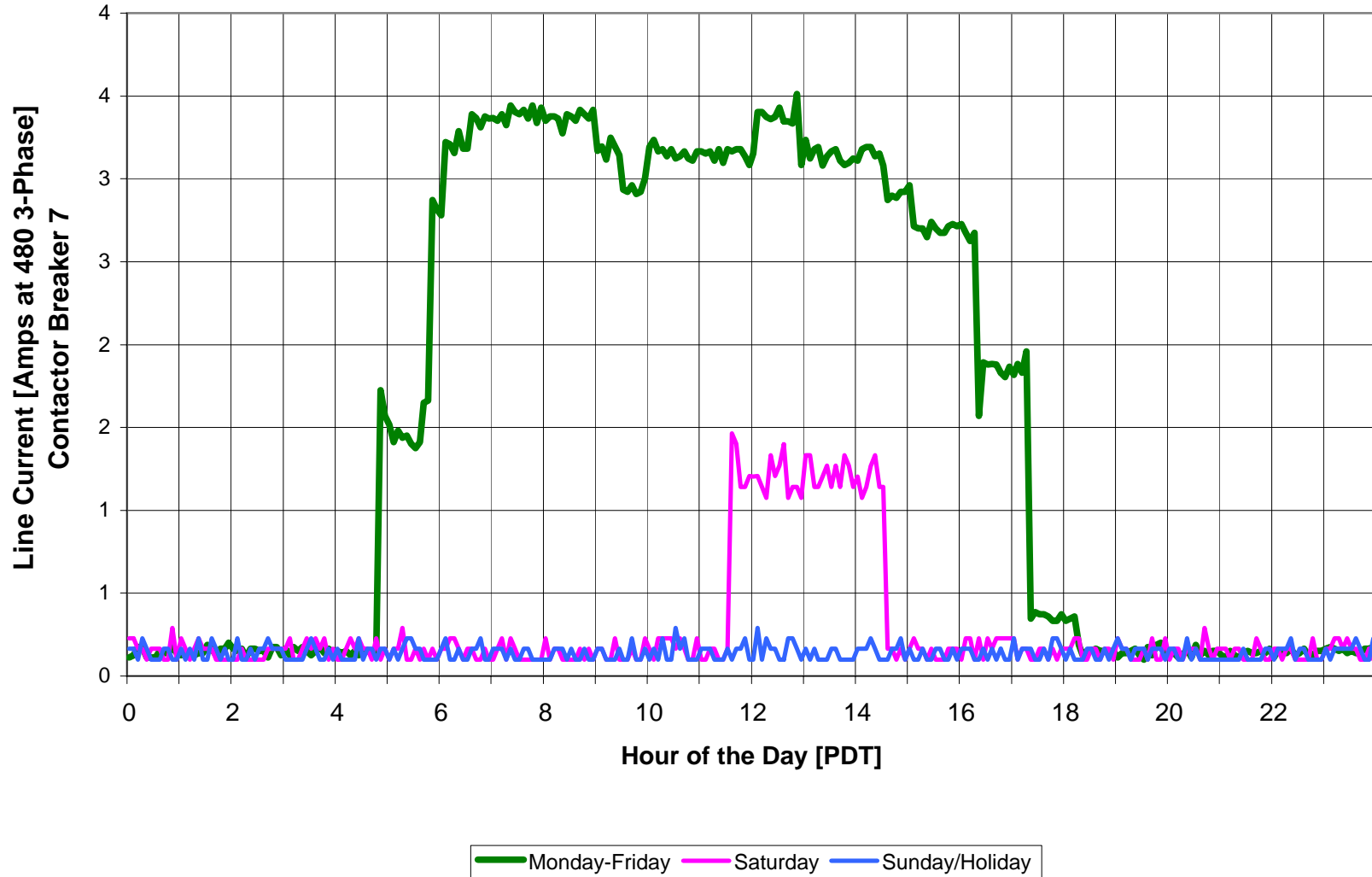


Monday-Friday Saturday Sunday/Holiday

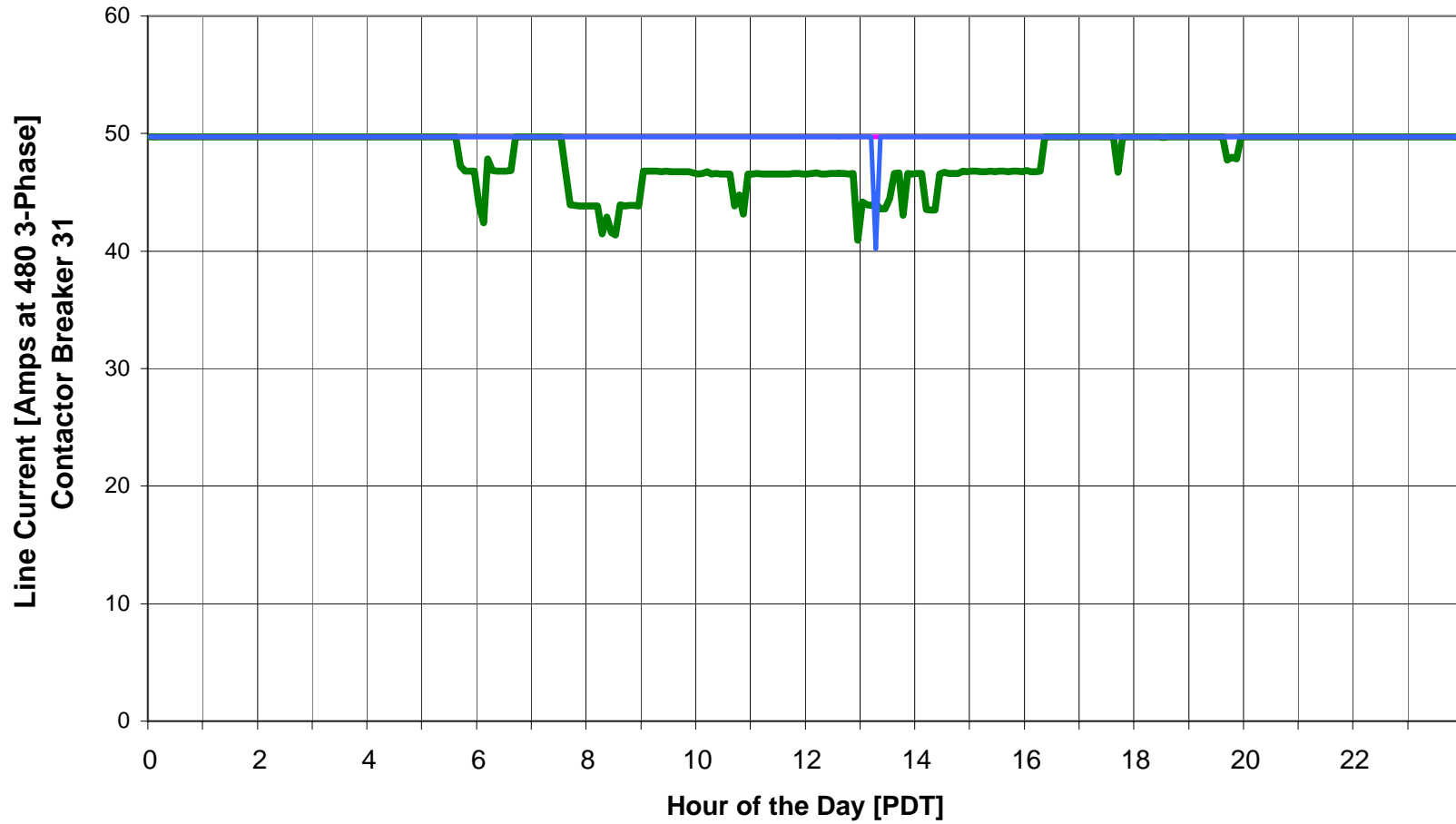
LA County ISD Auto Repair Shop Nov./Dec. 2003
Auto Paintshop
Average Daily Load Profile



LA County Eastern Avenue Warehouse March/April 2004
Warehouse T-5 Lights, (Emergency Lights)
Average Daily Load Profile

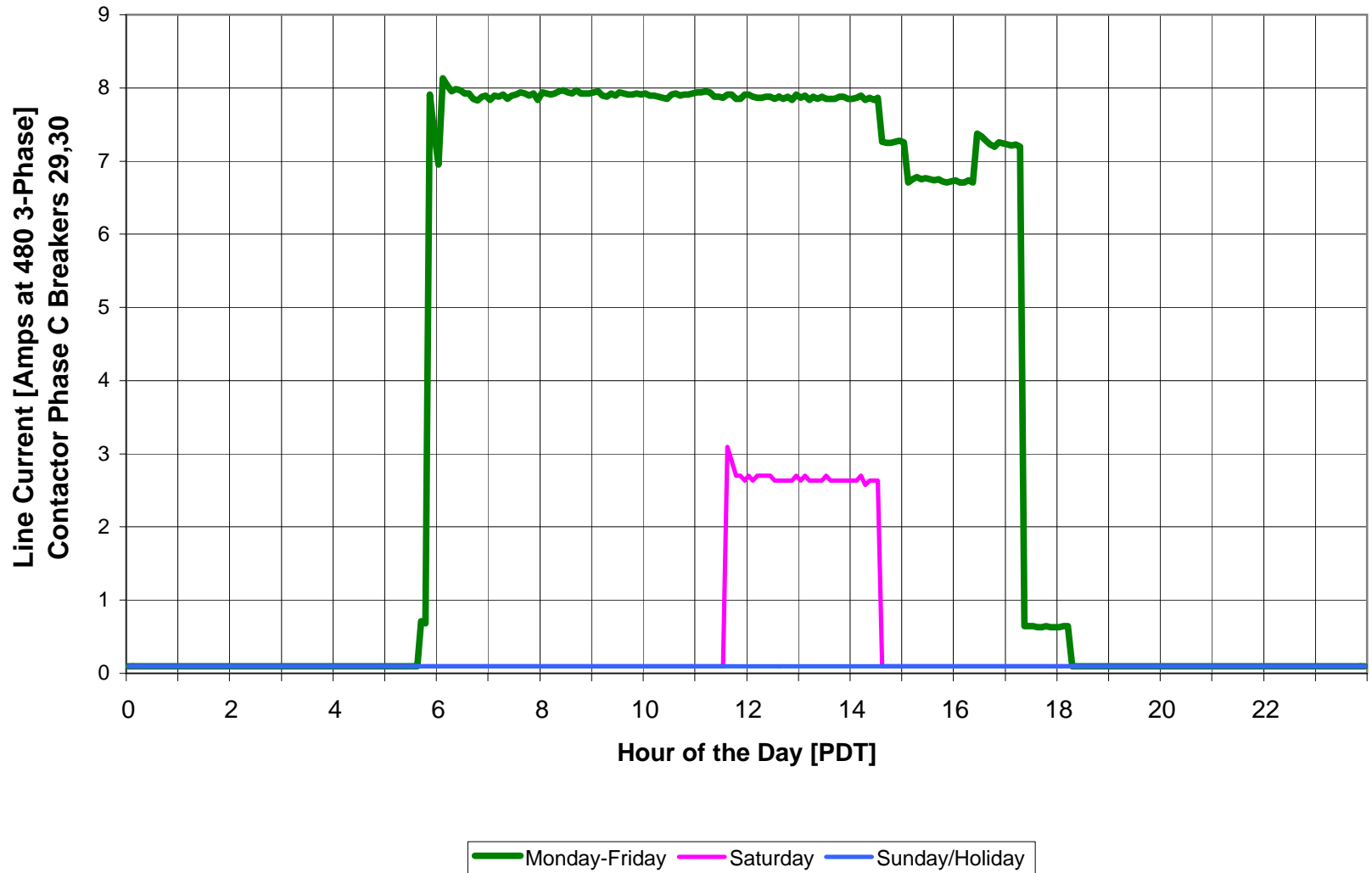


LA County Eastern Avenue Warehouse March/April 2004
Warehouse T-5 Lights
Average Daily Load Profile



Monday-Friday Saturday Sunday/Holiday

LA County Eastern Avenue Warehouse March/April 2004
Warehouse T-5 Lights
Average Daily Load Profile



Contractor As-Built Savings
26. ISD 1102 Eastern Ave

Contractor As-Built Savings 26. ISD 1102 Eastern Ave																						
Existing Fixtures												New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
52	Warehouse	MH400/1	Highbay	1	400W Metal Halide High Bay	218	458	53.568	2470	132,357		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	214	234	27.378	67,624	26.208	64,734
Total						218		53.568		132,357			Total				214		27.378	67,624	26.208	64,734

Contractor As-Built Savings
26. ISD 1104 Eastern Ave

Contractor As-Built Savings																						
		Existing Fixtures										New Fixtures								Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr
2	Weld Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	55	458	25.190	2470	62,219		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	55	234	12.870	31,789	12.320	30,430
5	Body Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	120	458	54.960	2470	135,751		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	120	234	28.080	69,358	26.880	66,394
8	Paint Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	47	458	21.526	2470	53,169		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	47	234	10.998	27,165	10.528	26,004
12	Large Auto Maintenance	MH400/1	Highbay	1	400W Metal Halide High Bay	340	458	155.720	2470	384,628		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	340	234	79.560	196,513	76.160	188,115
28	Paint Room	MH400/1	Highbay	1	400W Metal Halide High Bay	8	458	3.664	2470	9,050		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	8	234	1.872	4,624	1.792	4,426
36	Fire Trucks	MH400/1	Highbay	1	400W Metal Halide High Bay	152	458	69.616	2470	171,952		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	152	234	35.568	87,853	34.048	84,099
Total						722		330.676		816,770						Total	722		168.948	417,302	161.728	399,468

Contractor As-Built Savings
 26A. ISD 1110 Eastern Ave

		Existing Fixtures										New Fixtures								Savings			
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr	
52	Warehouse	MH175/1	Highbay		175W Metal Halide High Bay	66	200	13.200	2470	32,604		New 1x4x3 T5HO	F43ILP/H	T5	3	New 1x4x4 T5HO	44	175	7.700	19,019	5.500	13,585	
Total						66		13.200		32,604		Total						44		7.700	19,019	5.500	13,585

Aloha Systems Measured Savings
26. ISD 1102 Eastern Ave

		Existing Fixtures										New Fixtures								Savings					
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr			
52	Warehouse	MH400/1	Highbay	1	400W Metal Halide High Bay	174	458	79.692	3211	255,891		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	174	234	40.716	130,739	38.976	125,152			
	Millwright/ Welding Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	44	458	20.152	3211	64,708		Replace	F54T5HO	T5	6		44	342	15.048	48,319	5.104	16,389			
Total						218		99.844		320,599			Total						218		55.764		179,058	44.080	141,541

Aloha Systems Measured Savings
26. ISD 1104 Eastern Ave

		Existing Fixtures										New Fixtures										Savings		
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
2	Weld Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	55	458	25.190	3571	89,953		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	55	234	12.870	45,959	12.320	43,995		
5	Body Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	120	458	54.960	4933	271,118		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	120	234	28.080	138,519	26.880	132,599		
8	Paint Shop	MH400/1	Highbay	1	400W Metal Halide High Bay	47	458	21.526	4933	106,188		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	47	234	10.998	54,253	10.528	51,935		
12	Large Auto Maintenance	MH400/1	Highbay	1	400W Metal Halide High Bay	340	458	155.720	3571	556,076		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	340	234	79.560	284,109	76.160	271,967		
28	Paint Room	MH400/1	Highbay	1	400W Metal Halide High Bay	8	458	3.664	4933	18,075		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	8	234	1.872	9,235	1.792	8,840		
36	Fire Trucks	MH400/1	Highbay	1	400W Metal Halide High Bay	152	458	69.616	3571	248,599		Replace	F44ILP/H	T5	4	New 1x4x4 T5HO	152	234	35.568	127,013	34.048	121,585		
Total						722		330.676		1,290,008			Total						722		168.948	659,087	161.728	630,921

Aloha Systems Measured Savings
26A. ISD 1110 Eastern Ave

		Existing Fixtures										New Fixtures								Savings				
Item	AREA	Fixture Code	Fixture Type	Lamp(s) per Fixture	Fixture Description	# of Fixtures	Watts per Fixture	Total kW	Burn Hours	Total kWh/yr	Controls; motion sen.; & A/B	Retrofit or Replace	Fixture Code	Fixture Type	Lamp(s) per Fixture	Description of Proposed Fixtures	# of Fixtures	Watts per Fixture	Total kW	Total kWh/yr	kW	kWh/yr		
52	Warehouse	MV175/1	Highbay	1	175W Mercury Vapor High Bay	34	205	6.970	2951	20,568		New 1x4x3 T5HO	F43ILP/H	T5	3	New 1x4x4 T5HO	44	175	7.700	22,723	-0.730	-2,154		
	Warehouse	MV400/1	Highbay	1	400W mercury vapor	31	455	14.105	2951	41,624											14.105	41,624		
Total						65		21.075		62,192			Total						44		7.700	22,723	13.375	39,470

Complex Crafts Shop – 1102 Eastern Ave.



T-5 4-Lamp Fixtures



T-5 4-Lamp Fixtures (Warehouse)



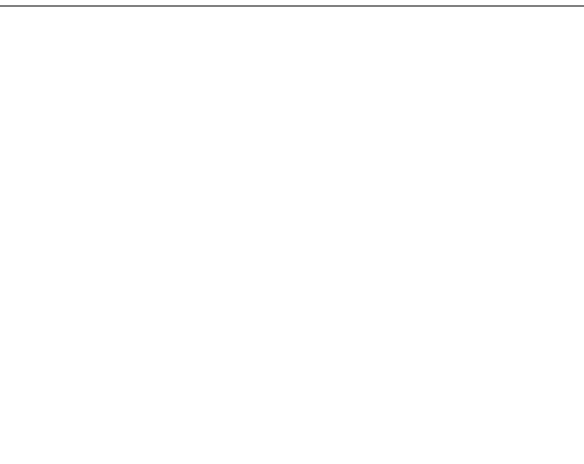
T-5 6-Lamp Fixture



Old HID Lights



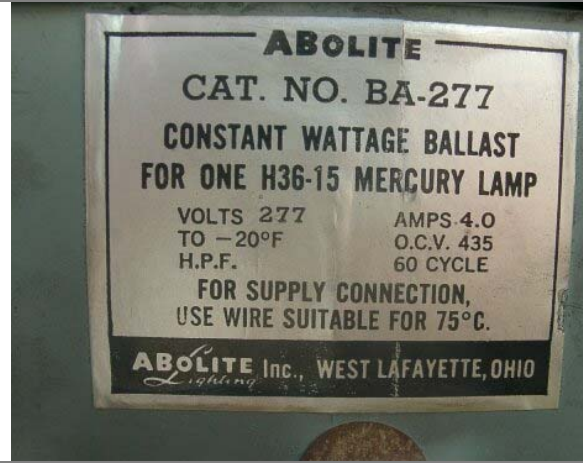
Sheriff Lights Panel With Dataloggers



Auto Repair Shop – 1104 Eastern Ave.



T-5 Fixtures and Old HID's



Old HID Nameplate



Panel LCG



Panel LCG Cover

ISD Warehouse – 1110 North Eastern Ave.



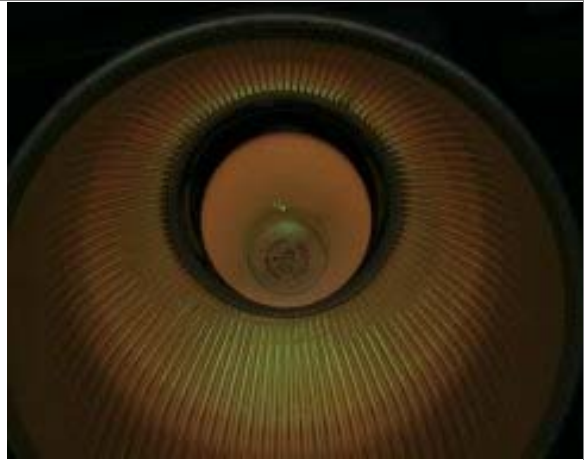
Warehouse (Old HID Lights)



175-Watt Mercury Fixture



175-Watt Spare Bulb



400-Watt Mercury Fixture



400-Watt Spare Bulb

Site Measurement and Verification Report

Library Time Clocks

Annual Energy Savings Estimates from Time Clocks	
LA County Estimate	261,600 kWh
<i>Ex-Ante</i> Evaluation	261,600 kWh
Aloha <i>Ex-Post</i> Evaluation	261,366 kWh

Site Descriptions

Twenty libraries located in various locations throughout Los Angeles County were selected to receive new time clocks for their chillers. The libraries vary in size and operating hours. The table below lists the libraries along with the newly-programmed chiller time clock hours for a typical work week.

1. Baldwin Park		2. Brakenseik		3. Claremont	
Sunday	Closed	Sunday	Closed	Sunday	7:30am-5:30pm
Monday	Closed	Monday	7:30am-8:30pm	Monday	Closed
Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm
Wednesday	7:30am-8:30pm	Wednesday	7:30am-8:30pm	Wednesday	7:30am-8:30pm
Thursday	7:30am-8:30pm	Thursday	7:30am-6:30pm	Thursday	7:30am-8:30pm
Friday	7:30am-5:30pm	Friday	7:30am-5:30pm	Friday	7:30am-4:30pm
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm	Saturday	7:30am-4:30pm
4. East Los Angeles		5. El Monte		6. Hacienda Heights	
Sunday	7:30am-5:30pm	Sunday	7:30am-5:30pm	Sunday	7:30am-5:30pm
Monday	7:30am-9:30pm	Monday	7:30am-8:30pm	Monday	7:30am-8:30pm
Tuesday	7:30am-9:30pm	Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm
Wednesday	7:30am-9:30pm	Wednesday	7:30am-8:30pm	Wednesday	7:30am-8:30pm
Thursday	7:30am-9:30pm	Thursday	7:30am-8:30pm	Thursday	7:30am-8:30pm
Friday	7:30am-5:30pm	Friday	7:30am-5:30pm	Friday	7:30am-6:30pm
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm

7. Huntington Park		8. Iacoboni		9. La Mirada	
Sunday	Closed	Sunday	7:30am-5:30pm	Sunday	Closed
Monday	7:30am-8:30pm	Monday	7:30am-8:30pm	Monday	Closed
Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm
Wednesday	7:30am-6:30pm	Wednesday	7:30am-8:30pm	Wednesday	7:30am-8:30pm
Thursday	7:30am-6:30pm	Thursday	7:30am-8:30pm	Thursday	7:30am-8:30pm
Friday	Closed	Friday	7:30am-6:30pm	Friday	7:30am-5:30pm
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm
10. La Puente		11. Norwalk		12. Los Nietos	
Sunday	Closed	Sunday	Closed	Sunday	Closed
Monday	Closed	Monday	7:30am-8:30pm	Monday	7:30am-7:30pm
Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm	Tuesday	7:30am-7:30pm
Wednesday	7:30am-8:30pm	Wednesday	7:30am-8:30pm	Wednesday	7:30am-6:30pm
Thursday	7:30am-5:30pm	Thursday	7:30am-6:30pm	Thursday	7:30am-6:30pm
Friday	7:30am-5:30pm	Friday	7:30am-6:30pm	Friday	7:30am-5:30pm
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm
13. Lynwood		14. Montebello		15. Rowland Heights	
Sunday	Closed	Sunday	Closed	Sunday	7:30am-5:30pm
Monday	7:30am-8:30pm	Monday	7:30am-8:30pm	Monday	7:30am-9:30pm
Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm	Tuesday	7:30am-9:30pm
Wednesday	7:30am-8:30pm	Wednesday	7:30am-6:30pm	Wednesday	7:30am-9:30pm
Thursday	7:30am-8:30pm	Thursday	7:30am-6:30pm	Thursday	7:30am-9:30pm
Friday	7:30am-6:30pm	Friday	7:30am-5:30pm	Friday	7:30am-6:30pm
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm

16. San Dimas		17. Temple City		18. Walnut	
Sunday	Closed	Sunday	Closed	Sunday	Closed
Monday	Closed	Monday	Closed	Monday	Closed
Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm
Wednesday	7:30am-8:30pm	Wednesday	7:30am-5:30pm	Wednesday	7:30am-6:30pm
Thursday	7:30am-8:30pm	Thursday	7:30am-8:30pm	Thursday	7:30am-6:30pm
Friday	7:30am-5:30pm	Friday	7:30am-5:30pm	Friday	7:30am-5:30pm
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm
19. Weaver		20. West Covina			
Sunday	Closed	Sunday	Closed		
Monday	Closed	Monday	7:30am-8:30pm		
Tuesday	7:30am-8:30pm	Tuesday	7:30am-8:30pm		
Wednesday	7:30am-8:30pm	Wednesday	7:30am-8:30pm		
Thursday	7:30am-6:30pm	Thursday	7:30am-8:30pm		
Friday	7:30am-5:30pm	Friday	7:30am-5:30pm		
Saturday	7:30am-5:30pm	Saturday	7:30am-5:30pm		

Pre-Retrofit

All of the libraries had time clocks of some type that controlled the operation of the chillers before installation of the new digital time clocks. Approximately 50% of the existing time clocks were 24-hour analog time clocks and the other 50% were seven-day analog time clocks. The table below shows the full load operating hours and energy usage per year of the chillers at each of the facilities before the new time clocks are installed. These numbers take into consideration the two different types of time clocks and were derived from the Southern California Edison SPC software program. The total annual energy use for all the library chillers prior to installing the new time clocks was 1,904,319 kWh.

Prior to Timer Installation		
Library	Full Load Hours Per Year	Annual Energy Usage
1. Baldwin Park Lib	1,677	88,989 kWh
2. Brakenseik Lib	1,809	95,991 kWh
3. Claremont Lib	1,783	94,615 kWh
4. East Los Angeles Lib	2,003	106,298 kWh
5. El Monte Lib	1,946	103,269 kWh
6. Hacienda Heights Lib	2,008	106,573 kWh
7. Huntington Park	1,672	88,713 kWh
8. Iacoboni Lib	1,951	103,545 kWh
9. La Mirada	1,677	88,989 kWh
10. La Puente Lib	1,661	88,163 kWh
11. Norwalk Lib	1,814	96,267 kWh
12. Los Nietos Lib	1,752	92,962 kWh
13. Lynwood Lib	1,824	96,817 kWh
14. Montebello Lib	1,798	95,441 kWh
15. Rowland Heights Lib	2,008	106,573 kWh
16. San Dimas Lib	1,677	88,989 kWh
17. Temple City Lib	1,661	88,163 kWh
18. Walnut Lib	1,677	88,989 kWh
19. Weaver Lib	1,666	88,438 kWh
20. West Covina Lib	1,819	96,542 kWh
Total	35,878	1,904,319 kWh

Post-Retrofit

The library chillers were retrofitted with new programmable digital time clocks. These time clocks were set to allow the chillers to operate within the range of hours specified in the “Site Descriptions” section of this report and to restrict their operation during the 11 county holidays. The table bellow shows the operating hours and energy use per year of the chillers at each of the facilities. These numbers were also derived from the SPC software estimating program. The total annual energy use for all 20 of the library chillers after installation of the new timers is 1,642,953 kWh.

After New Timer Installation		
Library	Full Load Hours Per Year	Annual Energy Usage
1. Baldwin Park Lib	1,342	71,145 kWh
2. Brakenseik Lib	1,576	83,529 kWh
3. Claremont Lib	1,551	82,227 kWh
4. East Los Angeles Lib	1,883	99,773 kWh
5. El Monte Lib	1,842	97,614 kWh
6. Hacienda Heights Lib	1,892	100,287 kWh
7. Huntington Park	1,318	69,837 kWh
8. Iacoboni Lib	1,851	98,128 kWh
9. La Mirada	1,342	71,145 kWh
10. La Puente Lib	1,312	69,524 kWh
11. Norwalk Lib	1,586	84,043 kWh
12. Los Nietos Lib	1,535	81,371 kWh
13. Lynwood Lib	1,606	85,123 kWh
14. Montebello Lib	1,556	82,450 kWh
15. Rowland Heights Lib	1,892	100,287 kWh
16. San Dimas Lib	1,342	71,145 kWh
17. Temple City Lib	1,312	69,524 kWh
18. Walnut Lib	1,342	71,145 kWh
19. Weaver Lib	1,322	70,047 kWh
20. West Covina Lib	1,596	84,609 kWh
Total	30,999	1,642,953 kWh

Energy Savings Calculations

The following table demonstrates the savings difference between the post-install kWh and the pre-install kWh for the replacement of the time clocks at all twenty libraries listed. All savings calculations used the SPC computer program to calculate annual full load hours and energy consumption for each of the chillers at each of the libraries. A summary of this data follows this report. The table demonstrates an annual reduction of 261,366 kWh for the twenty libraries from 1,904,319 kWh to 1,642,953 kWh.

Energy Savings Calculations

Library	Pre-Retrofit Annual Energy Use	Post-Retrofit Annual Energy Use	Annual Energy Savings
1. Baldwin Park Lib	88,989 kWh	71,145 kWh	17,844 kWh
2. Brakenseik Lib	95,991 kWh	83,529 kWh	12,462 kWh
3. Claremont Lib	94,615 kWh	82,227 kWh	12,388 kWh
4. East Los Angeles Lib	106,298 kWh	99,773 kWh	6,525 kWh
5. El Monte Lib	103,269 kWh	97,614 kWh	5,655 kWh
6. Hacienda Heights Lib	106,573 kWh	100,287 kWh	6,286 kWh
7. Huntington Park	88,713 kWh	69,837 kWh	18,876 kWh
8. Iacaboni Lib	103,545 kWh	98,128 kWh	5,417 kWh
9. La Mirada	88,989 kWh	71,145 kWh	17,844 kWh
10. La Puente Lib	88,163 kWh	69,524 kWh	18,638 kWh
11. Norwalk Lib	96,267 kWh	84,043 kWh	12,223 kWh
12. Los Nietos Lib	92,962 kWh	81,371 kWh	11,591 kWh
13. Lynwood Lib	96,817 kWh	85,123 kWh	11,694 kWh
14. Montebello Lib	95,441 kWh	82,450 kWh	12,991 kWh
15. Rowland Heights Lib	106,573 kWh	100,287 kWh	6,286 kWh
16. San Dimas Lib	88,989 kWh	71,145 kWh	17,844 kWh
17. Temple City Lib	88,163 kWh	69,524 kWh	18,638 kWh
18. Walnut Lib	88,989 kWh	71,145 kWh	17,844 kWh
19. Weaver Lib	88,438 kWh	70,047 kWh	18,390 kWh
20. West Covina Lib	96,542 kWh	84,609 kWh	11,933 kWh
Total	1,904,319 kWh	1,642,953 kWh	261,366 kWh

Savings Summary

The proposal was to install 20 timers, and 20 timers were in fact installed. For this reason the *ex-ante* savings estimate equals the original proposal's savings estimate.

The total *ex-post* evaluation of savings for the time clock retrofits is 261,366 kWh per year. This closeness of this number to the proposed/*ex-ante* number tends to validate both estimates. The timers were installed late in the program after having been at one time eliminated from the plan. We did not have detailed information about the individual chillers and did not have time to monitor their operation. We were told some very basic information about the chiller sizes and the type of time clocks previously in use, but even this information was not available on a site-by-site basis.

We used the SPC software as a readily available energy use estimation tool. Although not perfectly accurate, this approach was relatively well matched with the quality of detailed information we had anyway. We did not review the county staff's calculations or their methodology. Thus the two estimates – our 261,336 and the county's 261,600 – were developed independently and presumably by different methodologies. Because they are so close to one another, and because this measure represents less than 5% of the overall program savings, we believe that the level of detail and information used to evaluate this measure is adequate.

Time Clocks Annual kWh Savings					
Fixture Type	Proposed Qty.	Proposed kWh Savings	Actual Qty.	Aloha Ex-Ante Savings	Aloha Ex-Post Savings
Time Clocks	20	261,600	20	261,600	261,366
Total	20	261,600	20	261,600	261,366

**Library Time Clocks
Energy Savings Calculations**

Site	Pre-Retrofit											Equivalent Full Load hrs/yr With 50% Saturation of Time Clocks	Equivalent kWh/yr With 50% Saturation of Time Clocks
	Operated w/ 24 Hr Time clock				Operated w/ 7-Day Time Clock								
	Setting (Earliest-Latest)	hrs/yr	SPC Full Load hrs/yr	SPC kWh/yr	hrs/week	hrs/year	SPC kW Demand	SPC Full Load hrs/yr	SPC kWh/yr				
1. Baldwin Park Lib	7:30am-8:30pm	4,745	1,992	105,747	59	3,068	53	1,361	72,230			1,677	88,989
2. Brakenseik Lib	7:30am-8:30pm	4,745	1,992	105,747	70	3,640	53	1,625	86,235			1,809	95,991
3. Claremont Lib	7:30am-8:30pm	4,745	1,992	105,747	67	3,484	53	1,573	83,482			1,783	94,615
4. East Los Angeles Lib	7:30am-9:30pm	5,110	2,065	109,601	86	4,472	53	1,941	102,994			2,003	106,298
5. El Monte Lib	7:30am-8:30pm	4,745	1,992	105,747	82	4,264	53	1,899	100,791			1,946	103,269
6. Hacienda Heights Lib	7:30am-9:30pm	5,110	2,065	109,601	87	4,524	53	1,951	103,544			2,008	106,573
7. Huntington Park	7:30am-8:30pm	4,745	1,992	105,747	58	3,016	53	1,351	71,679			1,672	88,713
8. Iacaboni Lib	7:30am-8:30pm	4,745	1,992	105,747	83	4,316	53	1,909	101,342			1,951	103,545
9. La Mirada	7:30am-8:30pm	4,745	1,992	105,747	59	3,068	53	1,361	72,230			1,677	88,989
10. La Puente Lib	7:30am-8:30pm	4,745	1,992	105,747	56	2,912	53	1,330	70,578			1,661	88,163
11. Norwalk Lib	7:30am-8:30pm	4,745	1,992	105,747	71	3,692	53	1,635	86,786			1,814	96,267
12. Los Nietos Lib	7:30am-7:30pm	4,380	1,920	101,892	66	3,432	53	1,583	84,032			1,752	92,962
13. Lynwood Lib	7:30am-8:30pm	4,745	1,992	105,747	73	3,796	53	1,656	87,887			1,824	96,817
14. Montebello Lib	7:30am-8:30pm	4,745	1,992	105,747	68	3,536	53	1,604	85,134			1,798	95,441
15. Rowland Heights Lib	7:30am-9:30pm	5,110	2,065	109,601	87	4,524	53	1,951	103,544			2,008	106,573
16. San Dimas Lib	7:30am-8:30pm	4,745	1,992	105,747	59	3,068	53	1,361	72,230			1,677	88,989
17. Temple City Lib	7:30am-8:30pm	4,745	1,992	105,747	56	2,912	53	1,330	70,578			1,661	88,163
18. Walnut Lib	7:30am-8:30pm	4,745	1,992	105,747	59	3,068	53	1,361	72,230			1,677	88,989
19. Weaver Lib	7:30am-8:30pm	4,745	1,992	105,747	57	2,964	53	1,340	71,128			1,666	88,438
20. West Covina Lib	7:30am-8:30pm	4,745	1,992	105,747	72	3,744	53	1,646	87,336			1,819	96,542
Total				2,122,647					1,685,990			35,878	1,904,319

Site	Post-Retrofit			Savings	
	Operated w/ 7-Day Programmable Time Clock			Annual Energy Savings	
	Full Load hrs/yr	Energy Use			
1. Baldwin Park Lib	1,342 hrs/yr	71,145 kWh/yr		17,844 kWh/yr	
2. Brakenseik Lib	1,576 hrs/yr	83,529 kWh/yr		12,462 kWh/yr	
3. Claremont Lib	1,551 hrs/yr	82,227 kWh/yr		12,388 kWh/yr	
4. East Los Angeles Lib	1,883 hrs/yr	99,773 kWh/yr		6,525 kWh/yr	
5. El Monte Lib	1,842 hrs/yr	97,614 kWh/yr		5,655 kWh/yr	
6. Hacienda Heights Lib	1,892 hrs/yr	100,287 kWh/yr		6,286 kWh/yr	
7. Huntington Park	1,318 hrs/yr	69,837 kWh/yr		18,876 kWh/yr	
8. Iacaboni Lib	1,851 hrs/yr	98,128 kWh/yr		5,417 kWh/yr	
9. La Mirada	1,342 hrs/yr	71,145 kWh/yr		17,844 kWh/yr	
10. La Puente Lib	1,312 hrs/yr	69,524 kWh/yr		18,638 kWh/yr	
11. Norwalk Lib	1,586 hrs/yr	84,043 kWh/yr		12,223 kWh/yr	
12. Los Nietos Lib	1,535 hrs/yr	81,371 kWh/yr		11,591 kWh/yr	
13. Lynwood Lib	1,606 hrs/yr	85,123 kWh/yr		11,694 kWh/yr	
14. Montebello Lib	1,556 hrs/yr	82,450 kWh/yr		12,991 kWh/yr	
15. Rowland Heights Lib	1,892 hrs/yr	100,287 kWh/yr		6,286 kWh/yr	
16. San Dimas Lib	1,342 hrs/yr	71,145 kWh/yr		17,844 kWh/yr	
17. Temple City Lib	1,312 hrs/yr	69,524 kWh/yr		18,638 kWh/yr	
18. Walnut Lib	1,342 hrs/yr	71,145 kWh/yr		17,844 kWh/yr	
19. Weaver Lib	1,322 hrs/yr	70,047 kWh/yr		18,390 kWh/yr	
20. West Covina Lib	1,596 hrs/yr	84,609 kWh/yr		11,933 kWh/yr	
Total	30,999 hrs/yr	1,642,953 kWh/yr		261,366 kWh/yr	

Site Measurement and Verification Report

Site Number 30

Downey Administration Center VFD Controls

9150 E. Imperial Highway, Downey

SCE Account 3-011-5029-00

Annual Energy Savings Estimates from VFD Controls	
LA County Estimate	947,661 kWh
<i>Ex-Ante</i> Evaluation	947,611 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	851,687 kWh

Site Description

The Downey Administration Center is a single main two-story building. It comprises 357,342 square feet of floor space. The facility is an administration center for multiple departments of the County of Los Angeles. The building includes a large open space containing cubicles upstairs.

VFD and Motor Locations

A total of eight new motors and variable frequency drive units were installed on air handlers as part of the energy efficiency program. All of the old air handler motors were replaced by higher efficiency motors that are more suited for variable speed operation. Timers were also installed along with the new VFDs and motors, and are set to reduce the drive's speed during nights, weekends, and holidays, when the building is less occupied. Half of the motors and VFDs are located in the first floor and the other half are located on the second floor.

Preliminary Site Visit

The site was visited on March 26, 2003. Rudy Tovar escorted us throughout the facility. During this visit we installed eight dataloggers on one phase of each air handler fan unit. The data loggers are located in the fusible disconnects of each air handler motor. We collected amperage and logged initial power readings on each of the air handler fan motors using a Fluke 43B power quality meter. A summary of this data follows this commentary.

Post-Retrofit Audit

The site was again visited on March 4, 2004. On this visit we were able to take our power measurements directly from the variable frequency drives themselves. We also installed one datalogger on AH-5 to verify power and to verify the timer schedule for the nights and weekends. This datalogger was installed on Phase A of Panel PP8A on the line side of the breaker that feeds Air Handler Unit #5. A summary of this data follows this commentary.

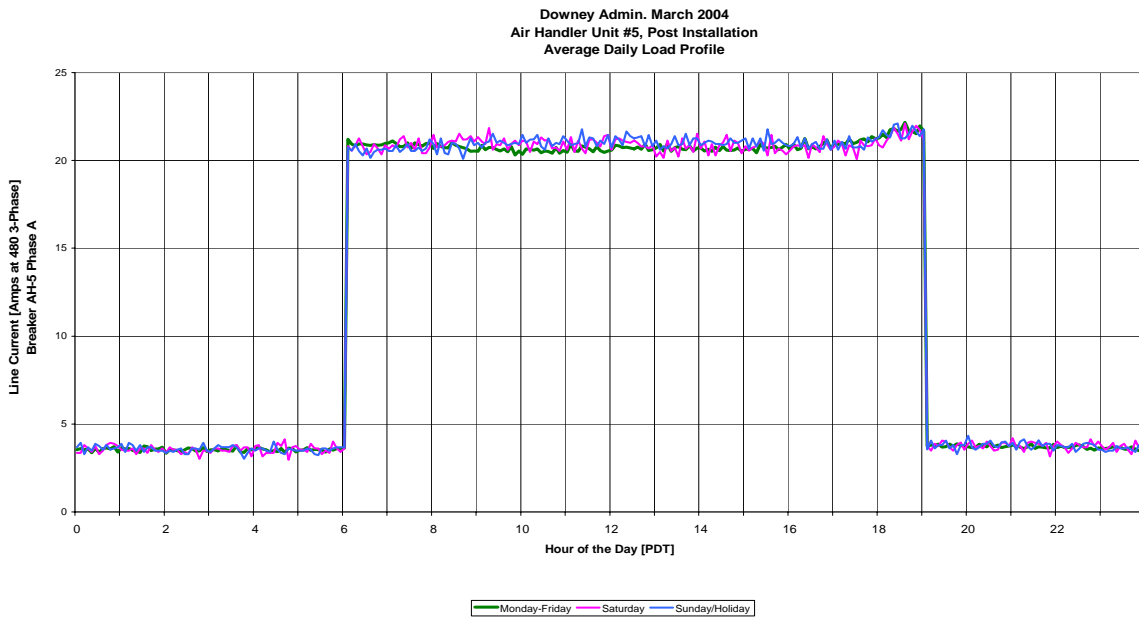
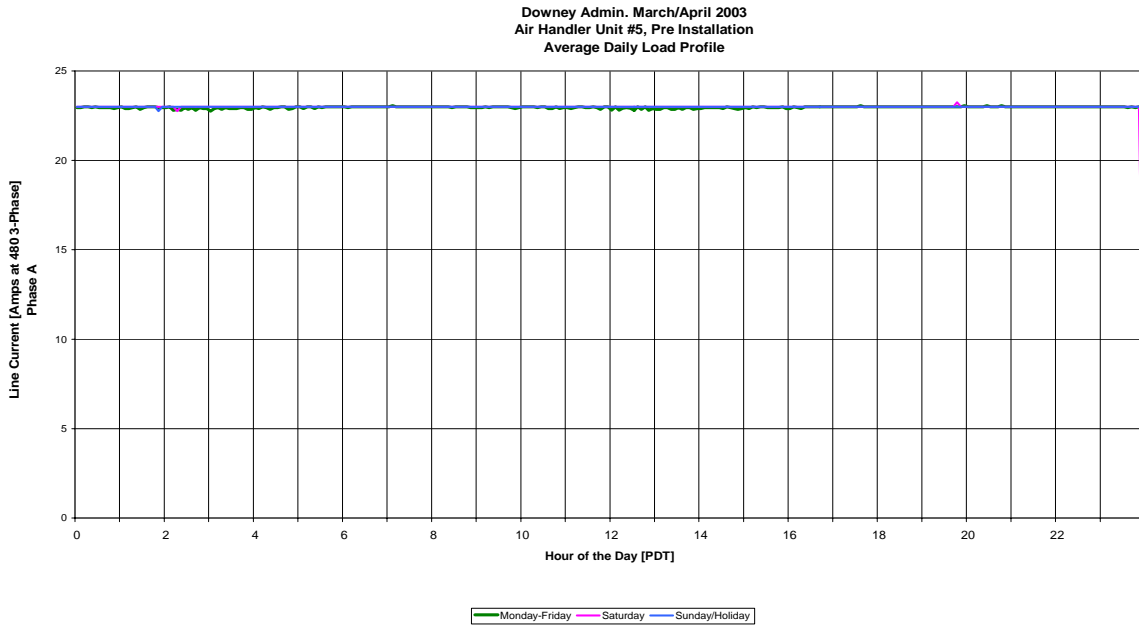
Metered Load Profiles

We collected interval data of energy consumption and operation behavior of the air handlers before the efficiency measures. After the new motors and VFDs were installed we measured one air handler again to represent the energy consumption and operation behavior of all new motors and VFDs. We also took power measurements directly from all the VFDs to verify these assumptions.

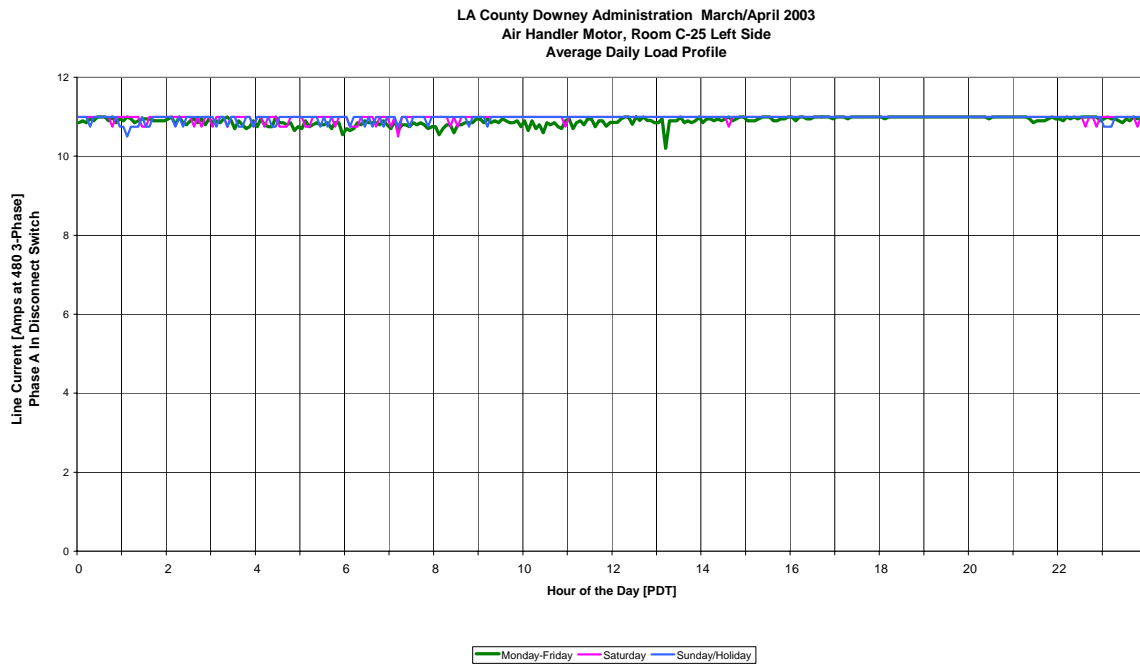
The initial load profiles, which are presented in the following graphs, verified that all of the fans operated continuously at essentially constant load, 24 hours per day and seven days per week. The post-installation load profile collected on Air Handler Unit 5 demonstrated the timer-controlled operation where the unit ran at full load for 13 hours per day and at partial load for 11 hours per day. The load profile demonstrated that this operation was the same every day of the week.

L.A. County staff said that the air handlers were supposed to operate on reduced load on weekends and holidays. They were told that this was not happening, and they then reprogrammed the units so that they would operate in the desired manner.

Air Handler Unit #5: This air handler is located on the first floor of the facility in Equipment Room C-54. One datalogger was installed on Panel PP8A Breaker AH-5 Phase A. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 16.19 kW. A datalogger was again installed after the installation of the new motor and VFD. . The recorded power draw of the new motor was 15.20 kW.

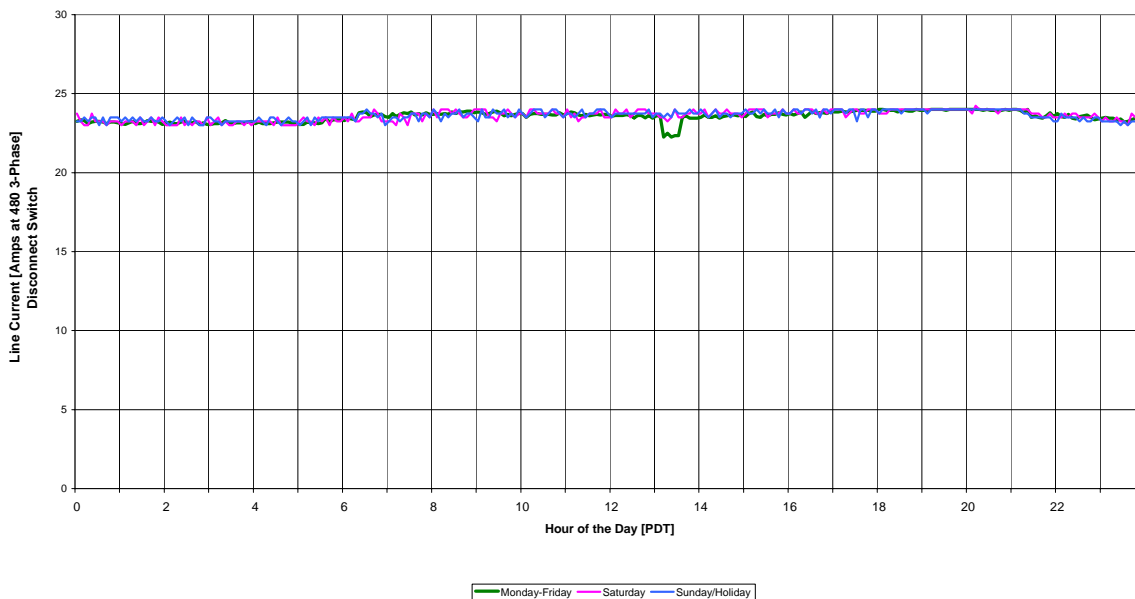


Air Handler Unit Room C-25, Left Side: This air handler is located on the first floor of the facility to the left of Equipment Room C-25. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 6.73 kW. The recorded power draw of the new motor was 6.40 kW.



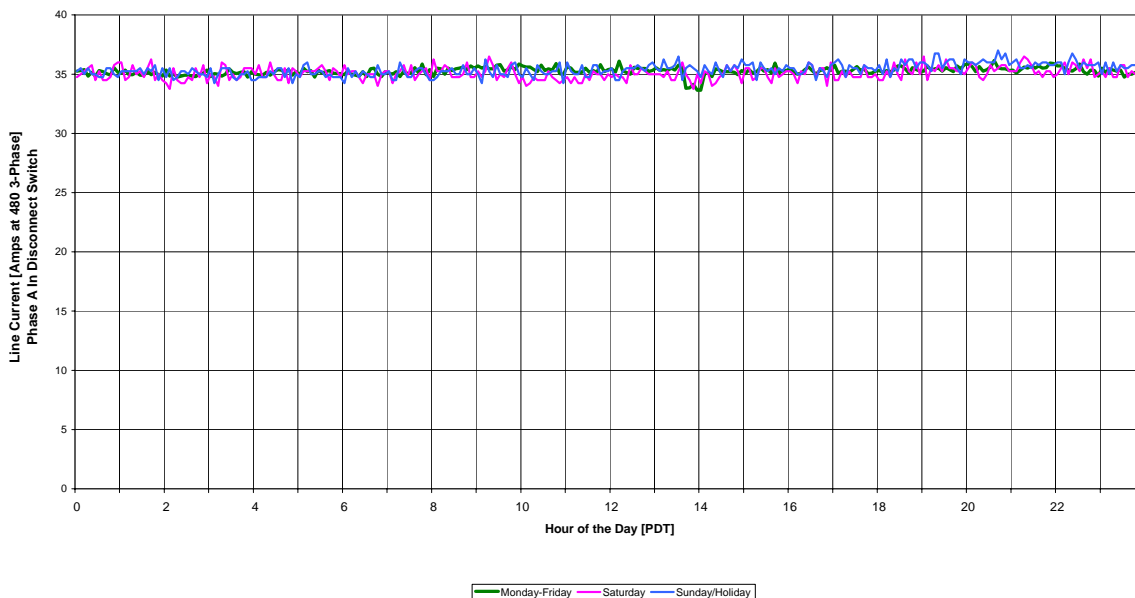
Air Handler Unit Room C-25, Right Side: This air handler is located on the first floor of the facility to the right of Equipment Room C-25. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 13.97 kW. The recorded power draw of the new motor was 11.30 kW.

LA County Downey Administration March/April 2003
 Air Handler Motor, Room C-25 Right Side
 Average Daily Load Profile

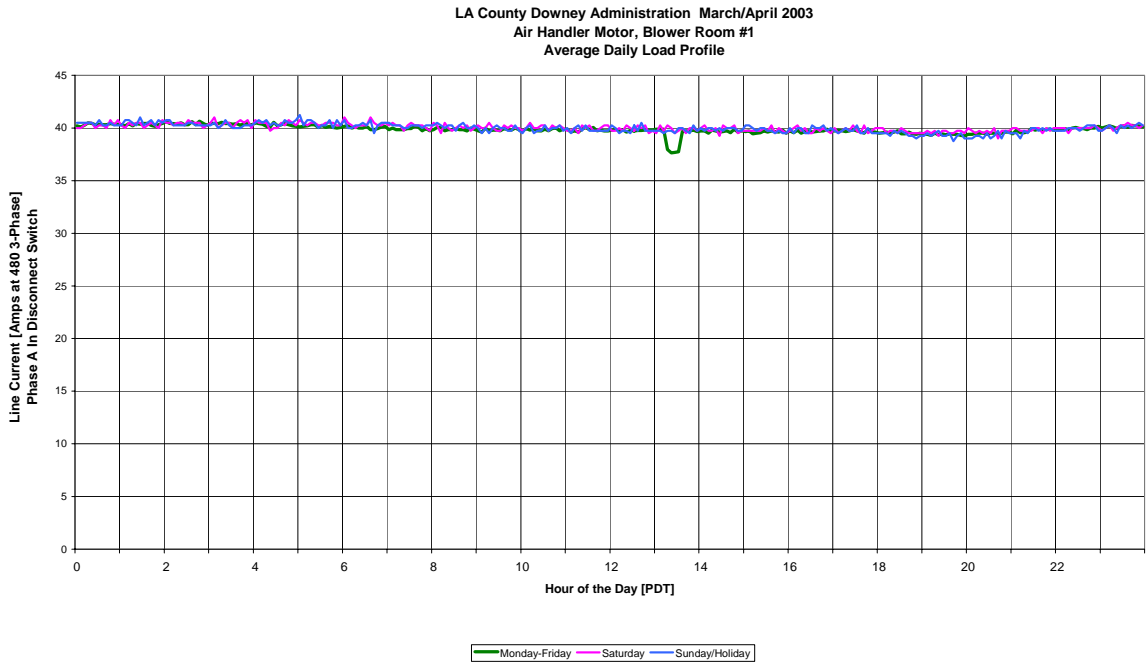


Air Handler Unit Room #3: This air handler is located on the second floor of the facility in Equipment Room #3. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 23.50 kW. The recorded power draw of the new motor was 32.50 kW.

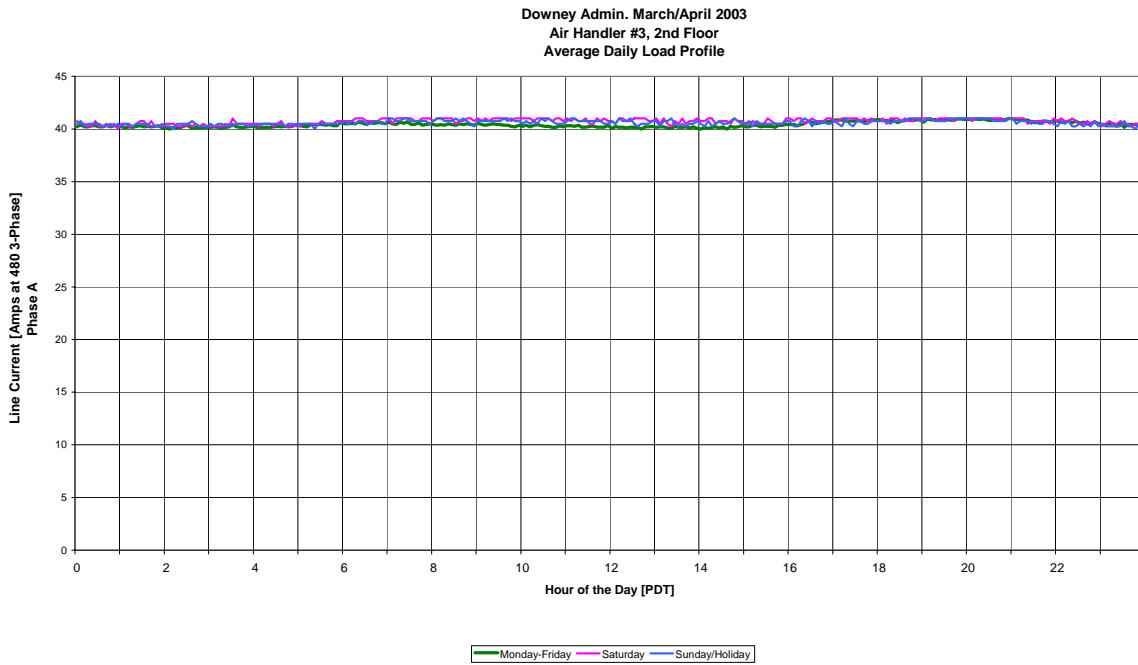
LA County Downey Administration March/April 2003
 Air Handler Motor, Blower Room #3
 Average Daily Load Profile



Air Handler Unit Room #1: This air handler is located on the second floor of the facility in Equipment Room #1. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 31.60 kW. The recorded power draw of the new motor was 30.80 kW.

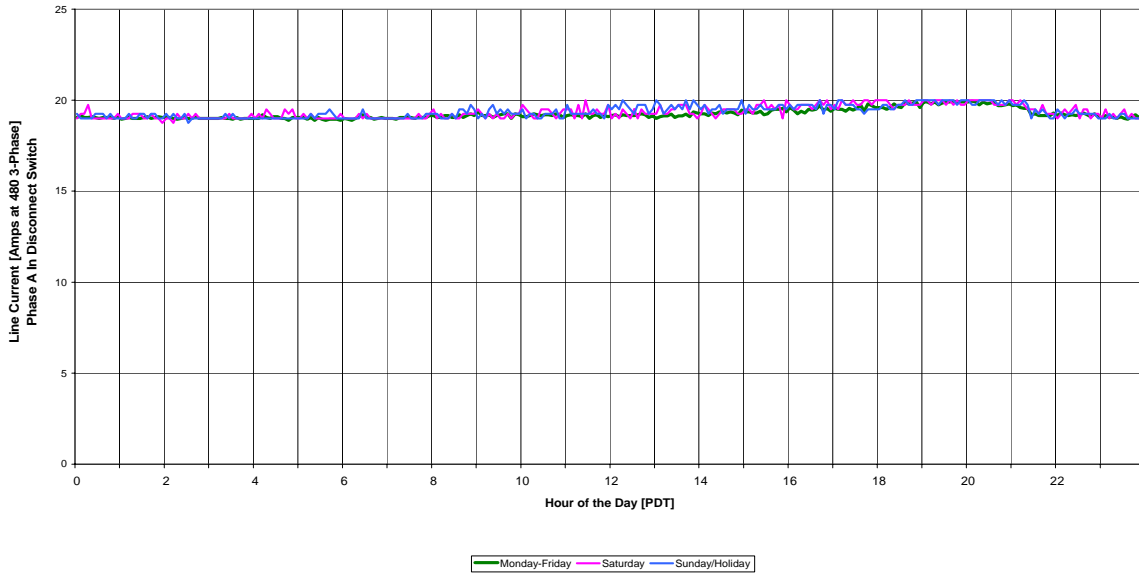


Air Handler Unit #3: This air handler is located on the second floor of the facility. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 27.63 kW. The recorded power draw of the new motor was 23.60 kW.



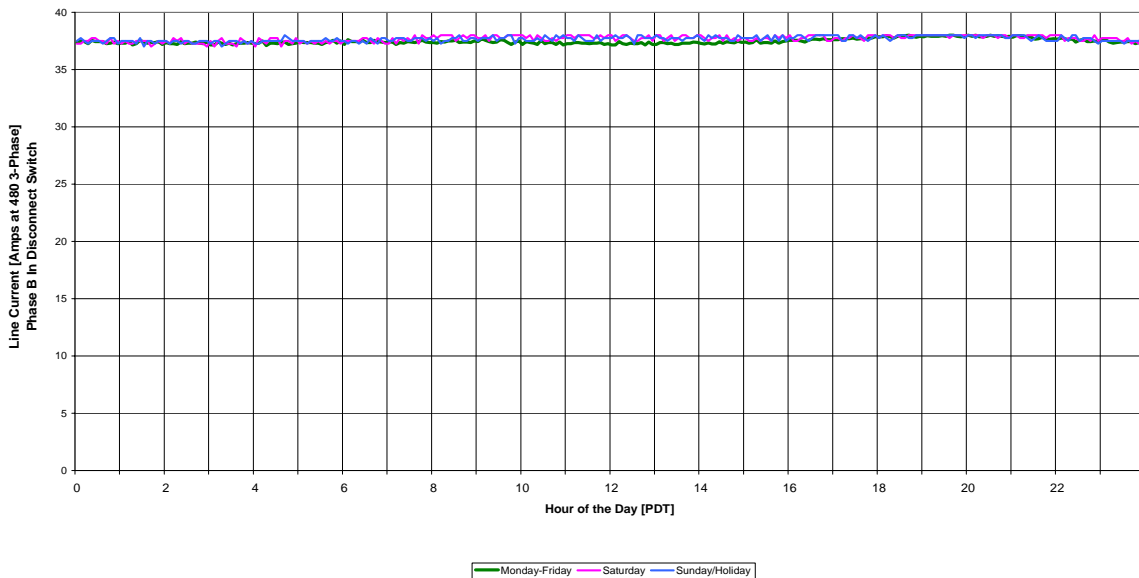
Air Handler Unit, Auditor Area: This air handler is located on the first floor of the facility. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 8.67 kW. The recorded power draw of the new motor was 1.3 kW. This low power reading was attributed to the fact that the motor was running at 35 Hz when it should have been 60 Hz. L.A. County staff was notified of this error. The actual power draw of the new motor rose to 6.7 kW after the error was corrected.

LA County Downey Administration March/April 2003
 Air Handler Motor, Auditor Area 1st Floor
 Average Daily Load Profile



Air Handler Unit Room #4: This air handler is located on the second floor of the facility in Equipment Room #4. A datalogger was installed on Phase A of the disconnect switch of the air handler. This datalogger recorded the operation of the old motor and shows a continuous operation throughout day and night as well as throughout the weekend. This gives a full-load operating time before installation of the new motor and VFD as 8,760 hours per year. The recorded power draw of the motor was 25.32 kW. The recorded power draw of the new motor was 20.00 kW.

LA County Downey Administration March/April 2003
 Air Handler Motor, Blower Room #4
 Average Daily Load Profile



Energy Savings Calculations

The following table demonstrates the savings by the difference between the post-install kWh and the pre-install kWh for each air handler unit that is part of the project. The savings show a reduction of 702,771 kWh/yr from 1,433,224 kWh/yr to 730,453 kWh/yr. Full load power measurements for the pre- and post-installation calculations were obtained from the old motor disconnect panels and from the VFD interface, respectively. Part load power was calculated as 20% of full load power. This reduction was verified through the reduction observation from the load profile of Air Handler #5 and through VFD readings. The pre-install hours of operation were 8,760 hours per year. Post installation hours had to be partitioned to account for part load operation and were obtained from the load profile of Air Handler #5. These hours account for a full load operation of 11 hours per day and part load operation of 13 hours per day through out the year.

Savings Calculations With Operation On Weekends and Holidays						
Air Handler Unit	Old Motors		New Motors and VFDs			Savings
	Full Load Power (kW)	kWh/yr	Full Load Power (kW)	Part Load Power (kW)	kWh/yr	kWh/yr
Air Handler #5, C-54 Equipment Room	16.19	141,824	15.20	3.04	75,453	66,372
C-25 Equipment Room (Left Side)	6.73	58,955	6.40	1.28	31,770	27,185
C-25 Equipment Room (Right Side)	13.97	122,377	11.45	2.29	56,838	65,539
W-81, Equipment Room #3	33.50	293,460	32.75	6.55	162,571	130,889
W-93, Equipment Room #1	31.60	276,816	30.85	6.17	153,139	123,677
Air Handler #3 Equipment Room	27.63	242,039	23.70	4.74	117,647	124,392
Auditor Controller Room, C-180	8.67	75,949	6.70	1.34	33,259	42,690
044, Equipment Room #4	25.32	221,803	20.10	4.02	99,776	122,027
TOTALS		1,433,224			730,453	702,771

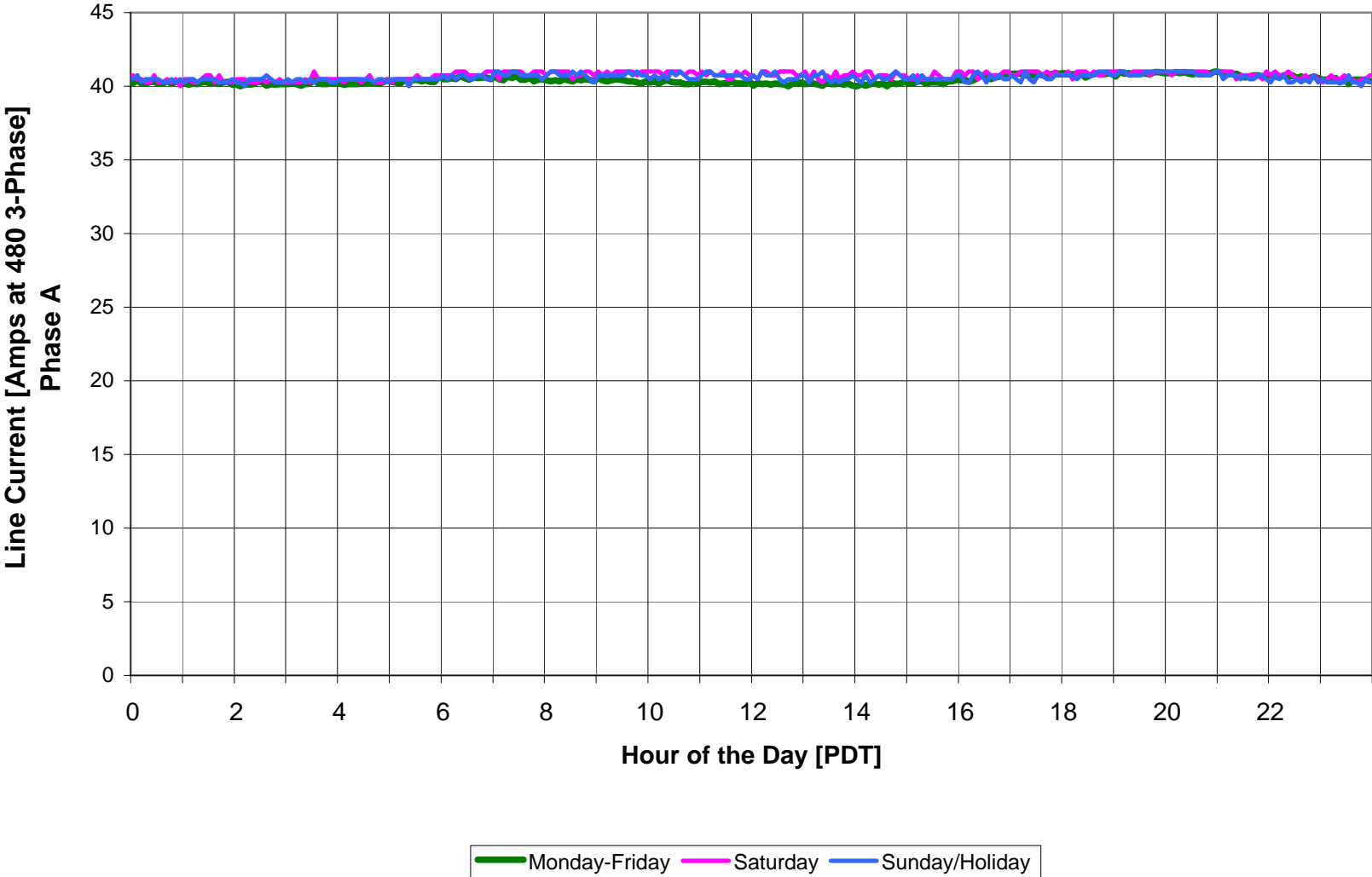
Weekend and Holiday operation of the air handler units was told to L.A. County staff by Aloha staff, and the correction to lower the operation of those units was made. After this correction, the savings increased to 851,687 kWh/yr from 1,433,224 kWh/yr to 581,537 kWh/yr. This is an increase in savings of 148,916 kWh/yr because of this correction. These savings are shown on the table on the following page.

Savings Calculations With Out Operation On Weekends and Holidays						
Air Handler Unit	Old Motors		New Motors and VFDs			Savings
	Full Load Power (kW)	kWh/yr	Full Load Power (kW)	Part Load Power (kW)	kWh/yr	kWh/yr
Air Handler #5, C-54 Equipment Room	16.19	141,824	15.20	3.04	60,070	81,754
C-25 Equipment Room (Left Side)	6.73	58,955	6.40	1.28	25,293	33,662
C-25 Equipment Room (Right Side)	13.97	122,377	11.45	2.29	45,250	77,127
W-81, Equipment Room #3	33.50	293,460	32.75	6.55	129,428	164,032
W-93, Equipment Room #1	31.60	276,816	30.85	6.17	121,919	154,897
Air Handler #3 Equipment Room	27.63	242,039	23.70	4.74	93,662	148,376
Auditor Controller Room, C-180	8.67	75,949	6.70	1.34	26,478	49,471
044, Equipment Room #4	25.32	221,803	20.10	4.02	79,435	142,368
TOTALS		1,433,224			581,537	851,687

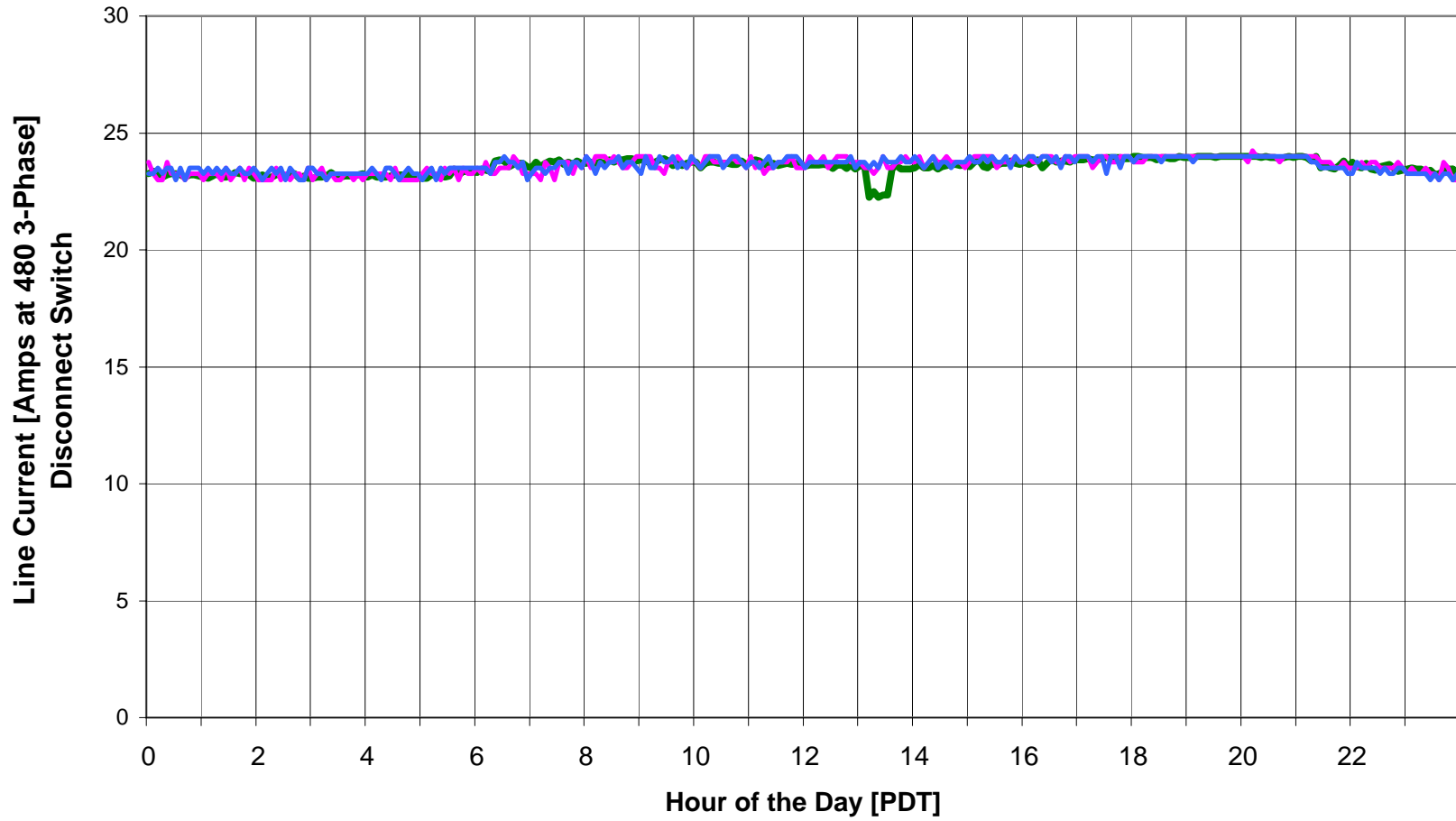
The *ex-post* energy savings are 851,687 kWh per year. The county's proposal called for installing eight VFD units for a total savings of 947,661 kWh per year. Eight units were in fact installed, making the *ex-ante* evaluation the same 947,661 kWh per year as the proposal.

The VFD units are capable of additional speed-reduction operations. Speed reduction to a lower level in less occupied times (early morning and early evening) would achieve additional savings and could easily bring the actual (*i.e. ex-post*) savings up to the *ex-ante* value. The county should explore the possibility of lowering early morning and late afternoon operations to perhaps 50% or 60% of full load. It is unknown whether this would allow the system to achieve required air ventilation rates, but if it did, the additional savings from this operation would be achieved.

Downey Admin. March/April 2003
Air Handler #3, 2nd Floor
Average Daily Load Profile

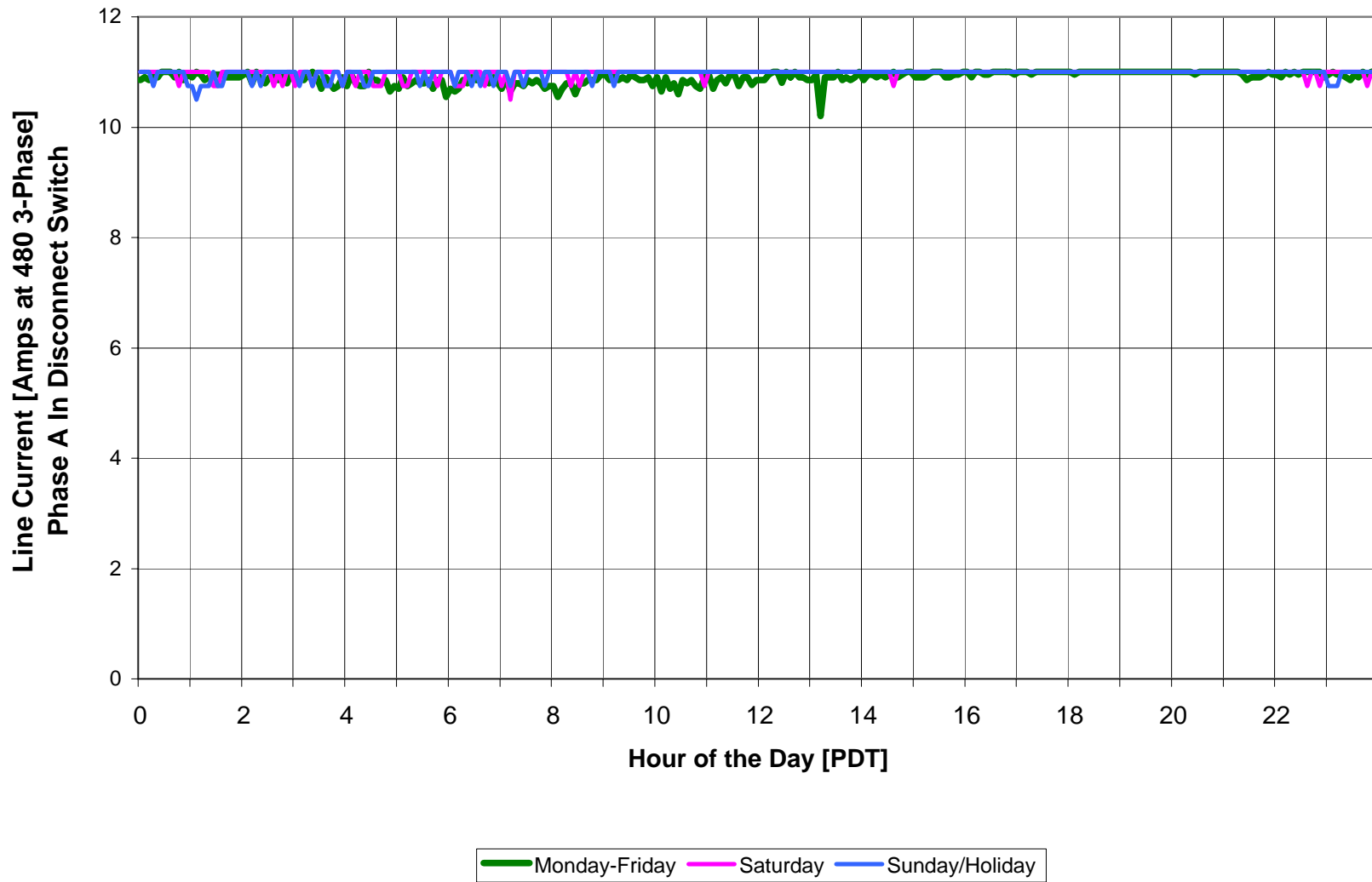


LA County Downey Administration March/April 2003
Air Handler Motor, Room C-25 Right Side
Average Daily Load Profile

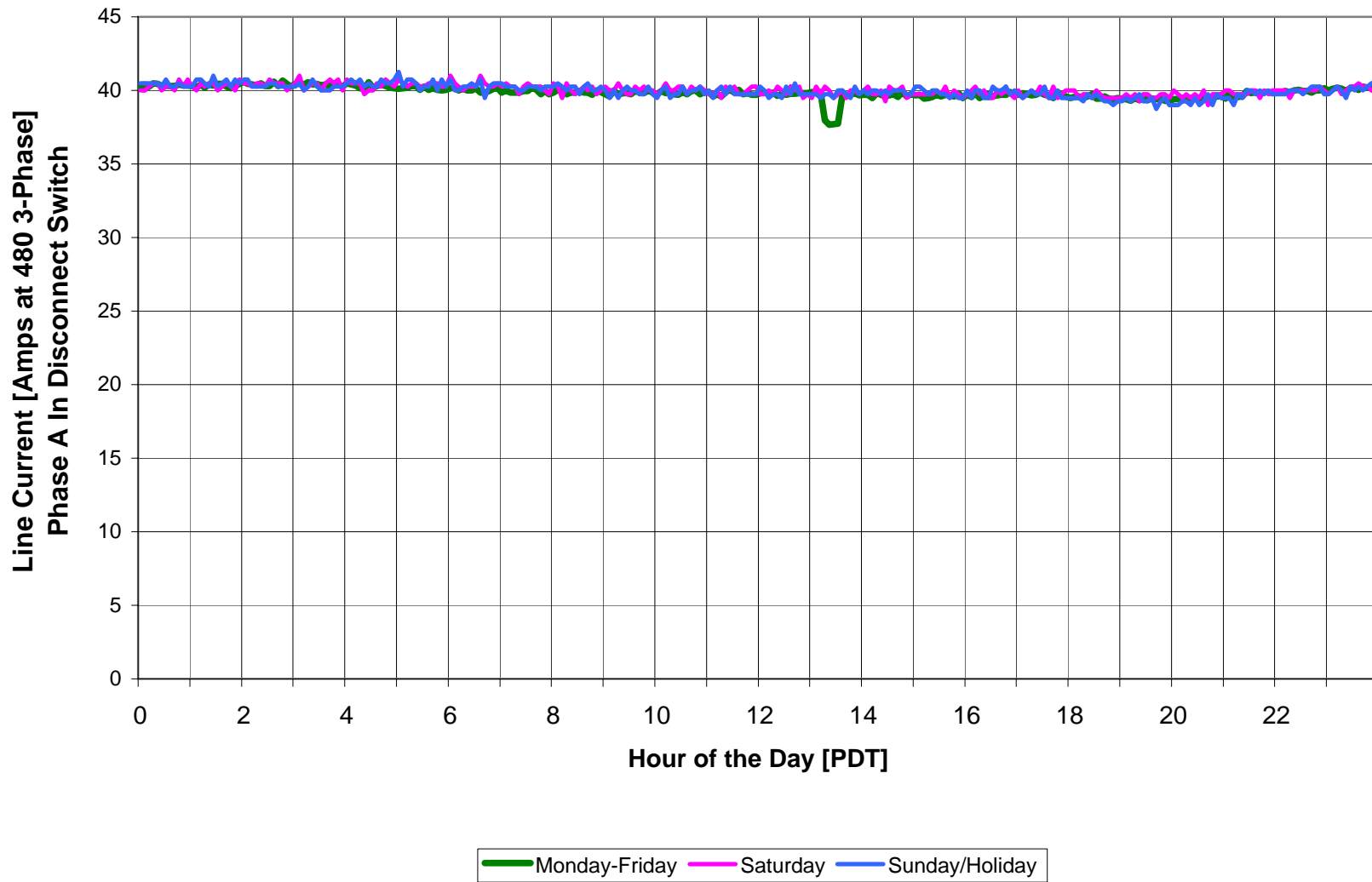


Monday-Friday Saturday Sunday/Holiday

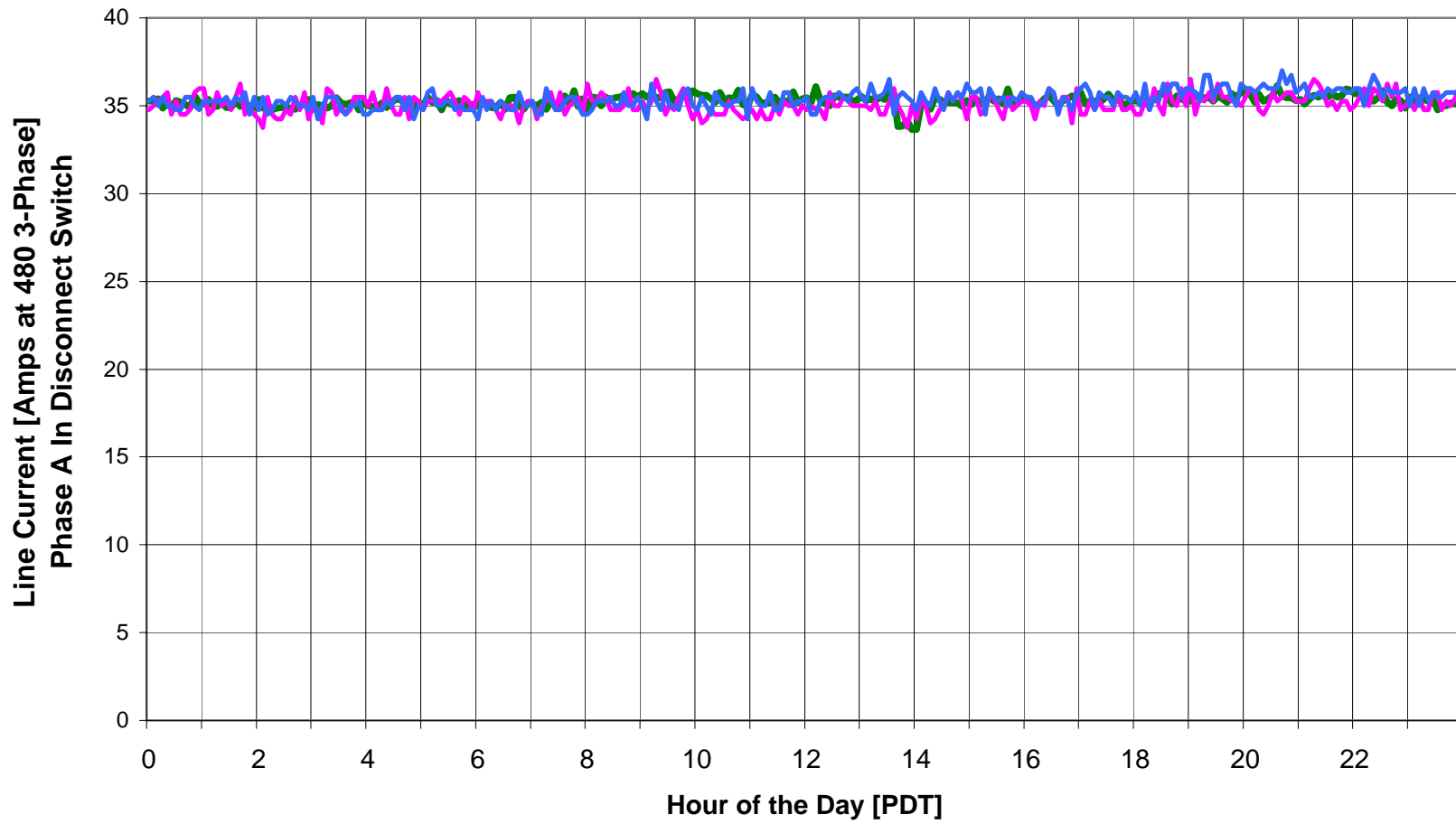
LA County Downey Administration March/April 2003
Air Handler Motor, Room C-25 Left Side
Average Daily Load Profile



LA County Downey Administration March/April 2003
Air Handler Motor, Blower Room #1
Average Daily Load Profile

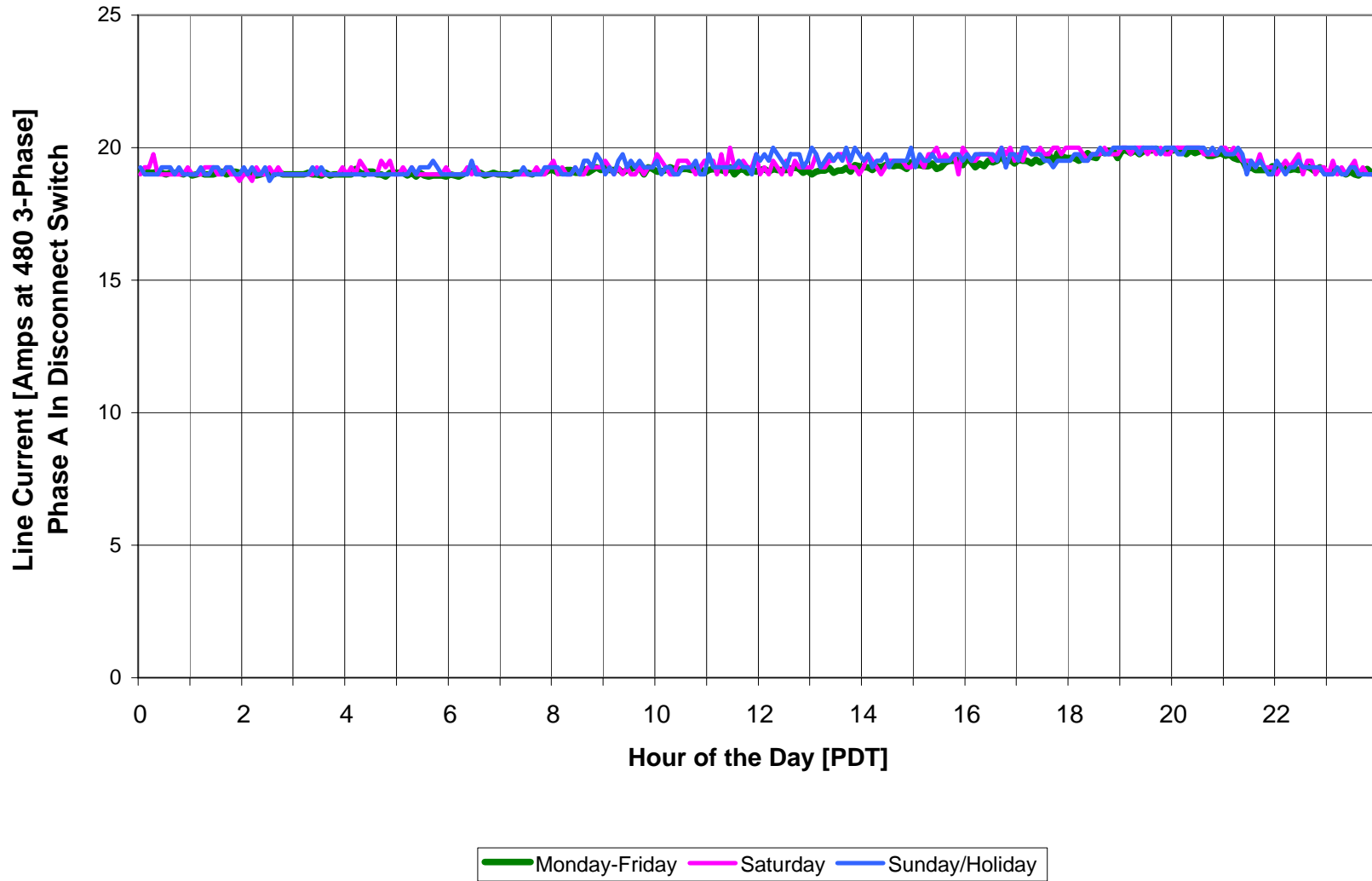


LA County Downey Administration March/April 2003
Air Handler Motor, Blower Room #3
Average Daily Load Profile

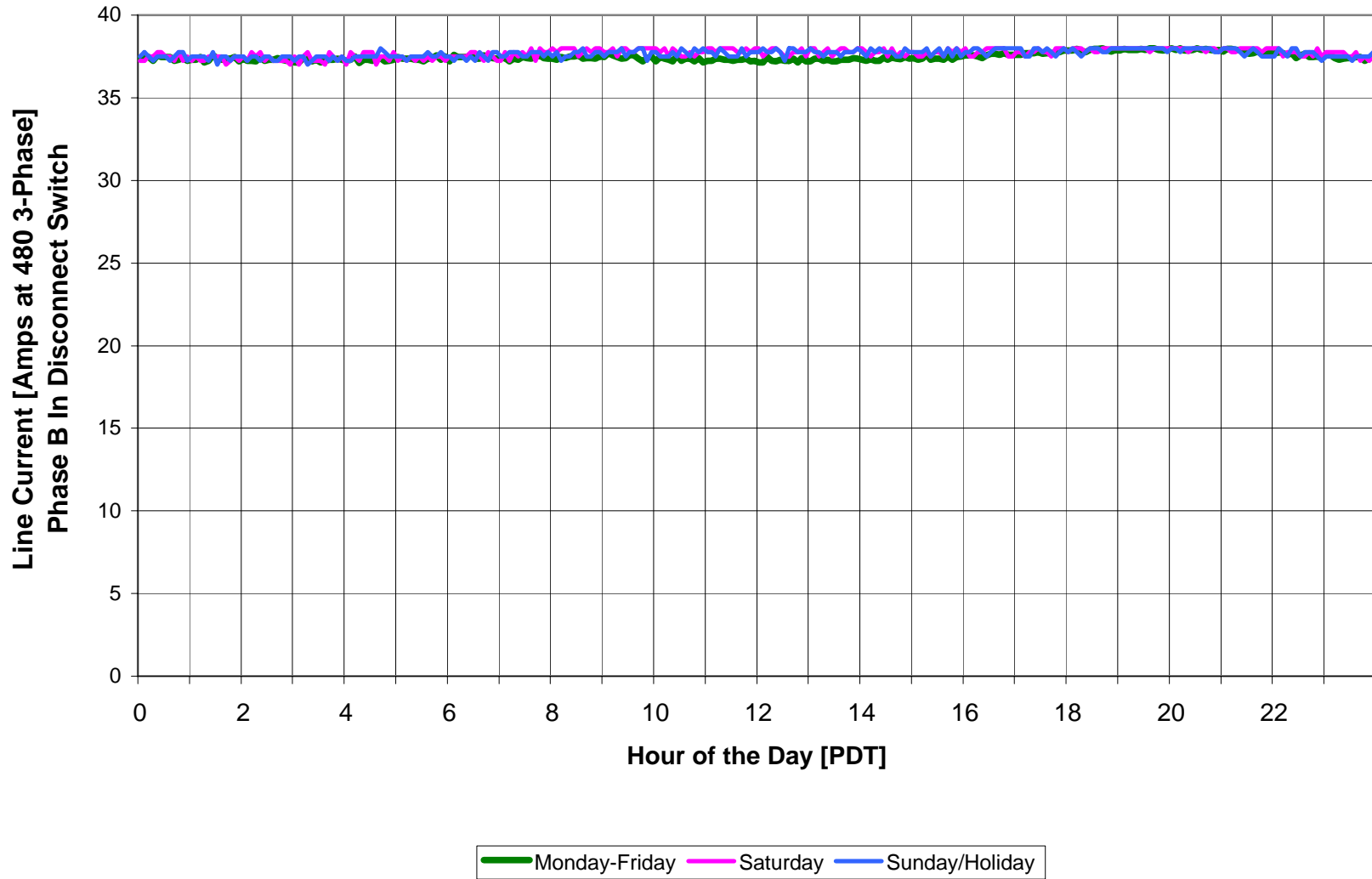


Monday-Friday Saturday Sunday/Holiday

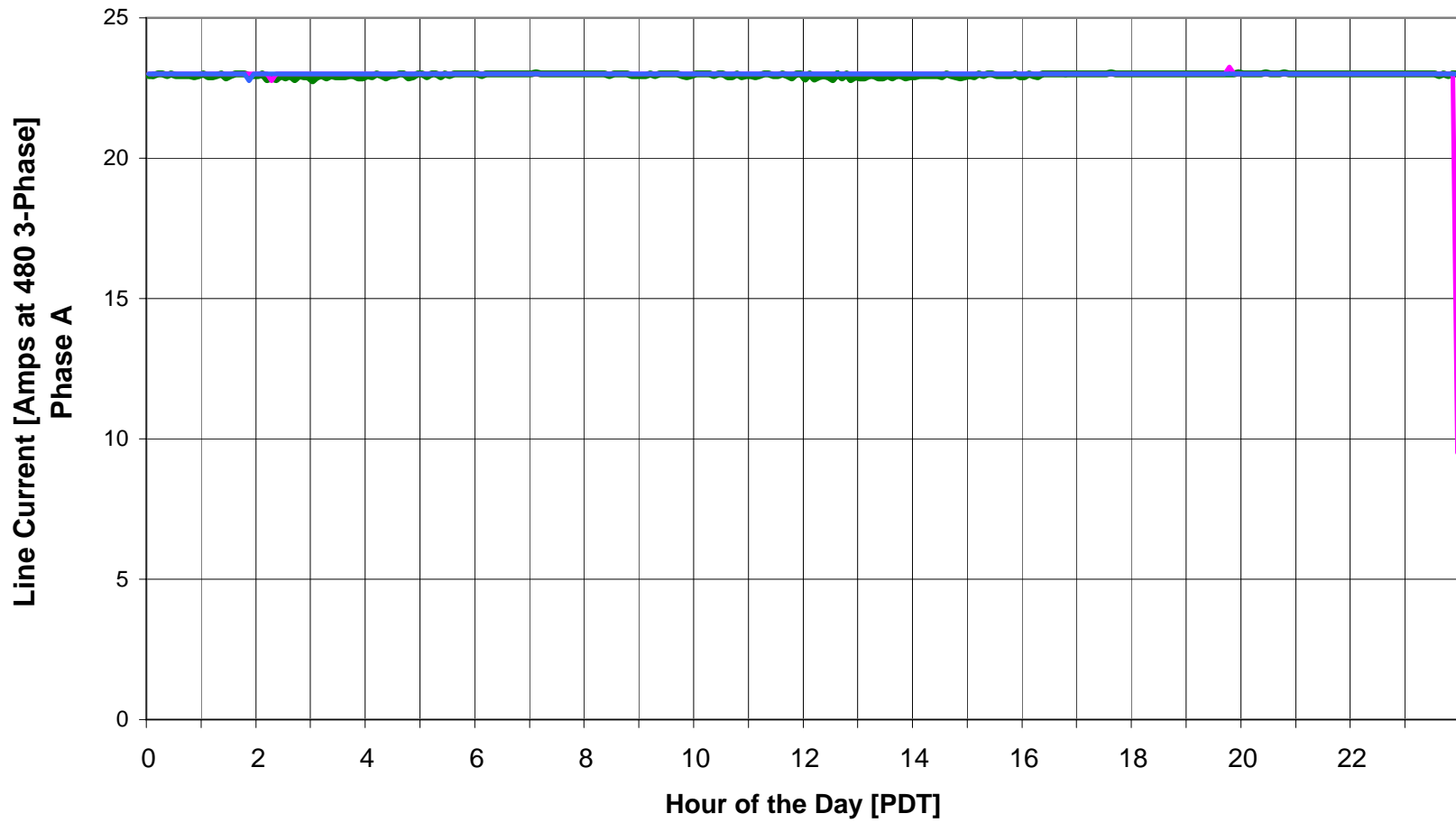
LA County Downey Administration March/April 2003
Air Handler Motor, Auditor Area 1st Floor
Average Daily Load Profile



LA County Downey Administration March/April 2003
Air Handler Motor, Blower Room #4
Average Daily Load Profile

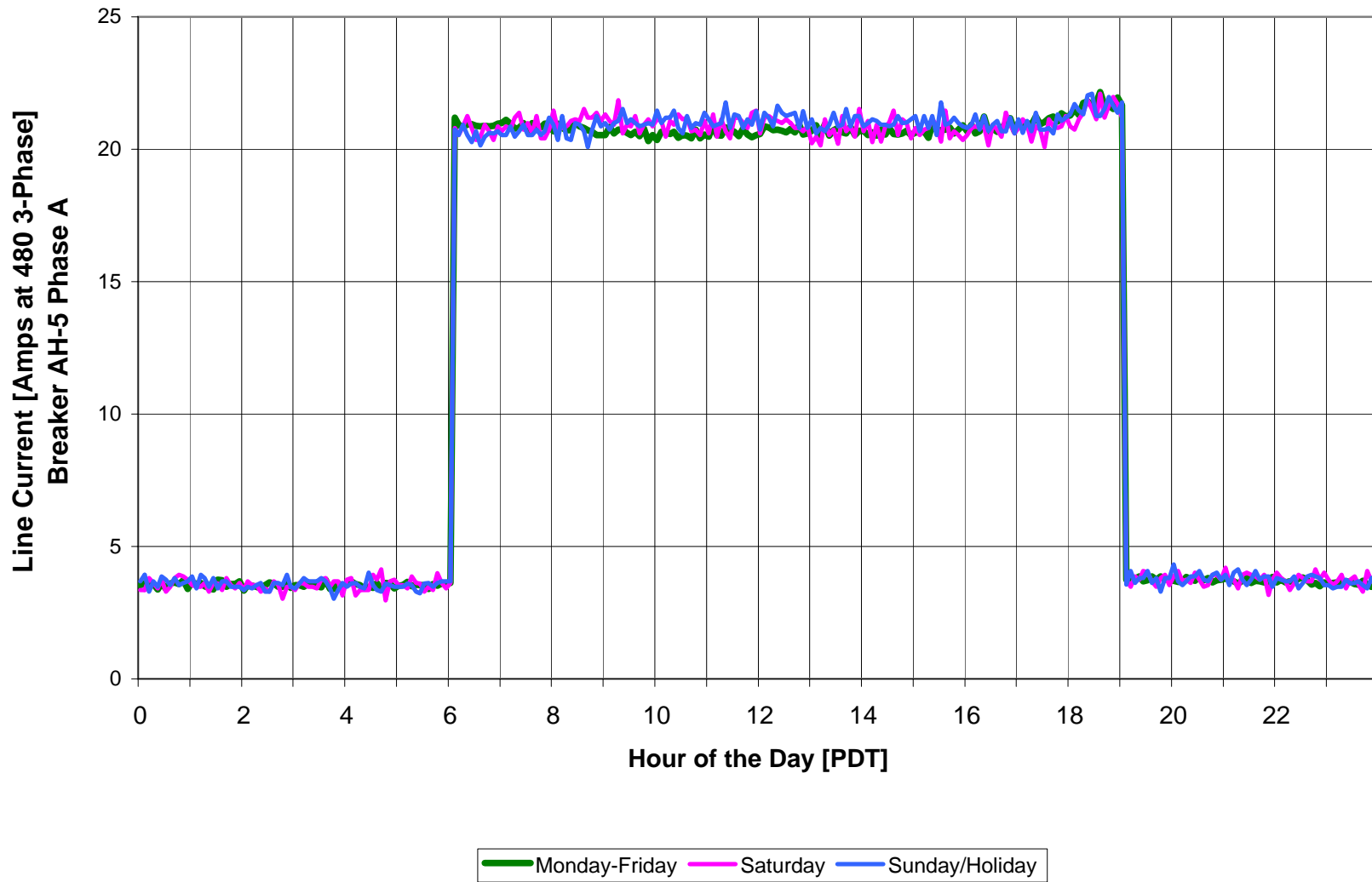


**Downey Admin. March/April 2003
Air Handler Unit #5, Pre Installation
Average Daily Load Profile**



Monday-Friday Saturday Sunday/Holiday

Downey Admin. March 2004
Air Handler Unit #5, Post Installation
Average Daily Load Profile



ISD Downey Administration Building – 9150 W. Imperial Hwy



Downey Administration Building Entrance



C-54, Downstairs West Air Handler Room



Room 044 AHU Disconnect



Room 044 AHU New VFD System



Room 044 AHU Dual Shaft Motor



Room 044 AHU New Motor

ISD Downey Administration Building – 9150 W. Imperial Hwy



Room C-25 Left Side AHU Disconnect



Room C-25 Right Side AHU Disconnect



Room C-25 Left Side AHU



Room C-25 Right Side AHU



Room C-25 Left Side New Motor



Room C-25 Right Side New Motor

ISD Downey Administration Building – 9150 W. Imperial Hwy



Room C-54, AH-3 and AH-5 Breakers



Room C-54, AH-3 and AH-5 Disconnects



AH-5 Motor



AH-5 Motor (New)

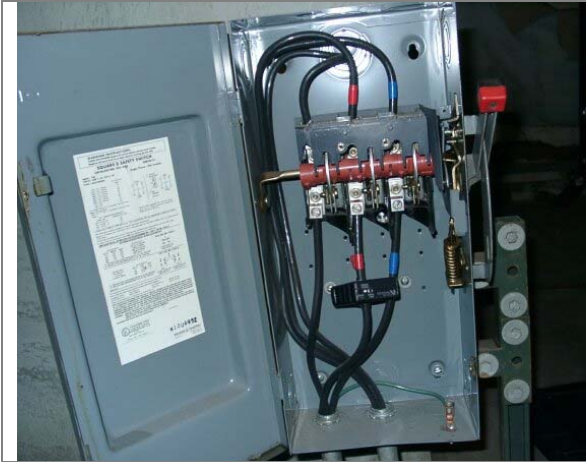


AH-3



AH-3 Motor (New)

ISD Downey Administration Building – 9150 W. Imperial Hwy



Upstairs SE Corner AHU Disconnect



Auditor Room New VFD System



Upstairs SE Corner AHU Motor



Auditor Room Motor (New)



W-81 Room 3 AHU Disconnect



W-81 Room 3 AHU Motor

ISD Downey Administration Building – 9150 W. Imperial Hwy



W-81 Room 3 AHU



W-81 Room Motor (New)



W-81 Room New VFD System with Timer



W-93 Room 4 AHU Motor (New)



W-93 Room 4 AHU Motor



W-93 Room 4 AHU

Site Measurement and Verification Report

Site Number 33

Harbor UCLA Medical Center Chiller Retrofit

1000 W. Carson Street, Torrance

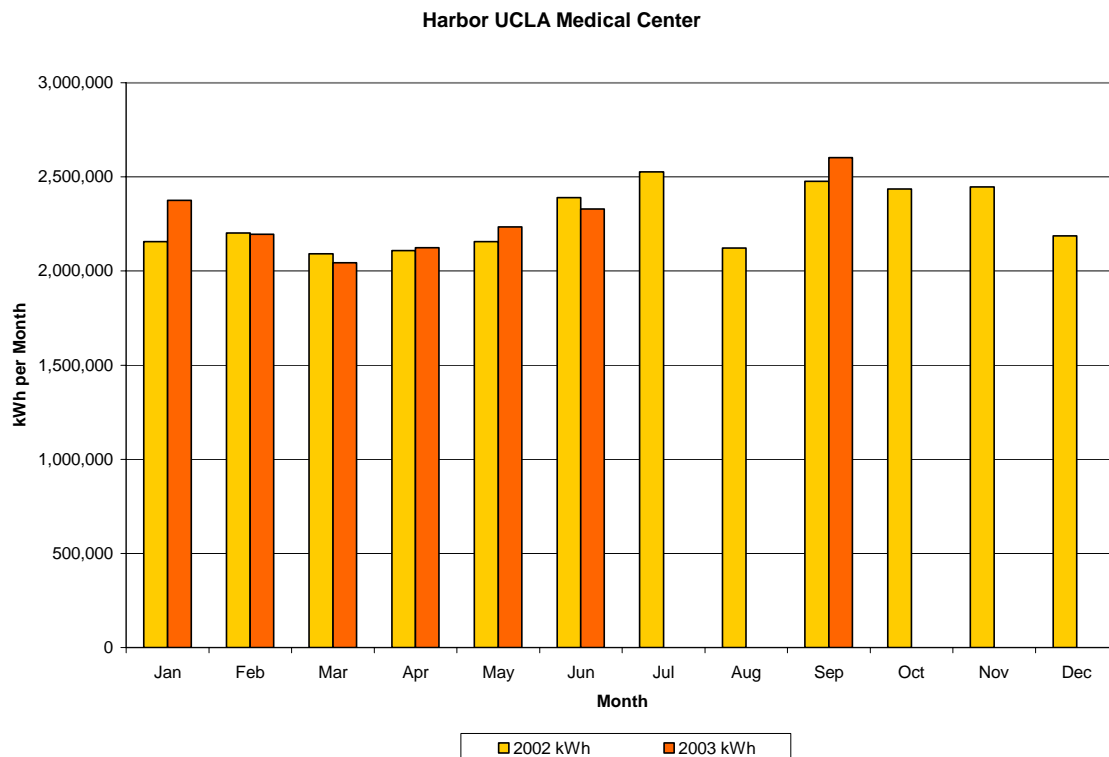
SCE Account 3-012-4211-96

Annual Energy Savings Estimates from VFD Controls	
LA County Estimate	954,267 kWh
<i>Ex-Ante</i> Evaluation	954,267 kWh
Aloha <i>Ex-Post</i> Measured Evaluation	1,356,177 kWh

Site Description

UCLA Medical Center is cooled by a central plant which generates chilled water. The central plant contains two Trane 1200-ton centrifugal chillers, one York 750-ton chiller, and a BAC cooling tower. When weather conditions allow, the cooling tower can cool the chilled water loop through a direct heat exchanger without needing any chiller to operate.

The medical center's annual energy consumption in 2002 was 27,296,194 kWh, and its peak demand was 5,248 kW. Consumption figures for the rest of 2003 were not easily available because Southern California Edison eliminated its easy Internet access to customer usage histories.



Preliminary Site Visit

The site was visited on December 26, 2002. Rudy Tovar escorted us throughout the facility. During this visit we noted the existing equipment and were given 2000 to 2002 daily operating data for all of the chillers in the facility.

Post-Retrofit Audit

The new chiller was finally commissioned on March 25, 2004. We visited the site again on April 22, 2004. On this visit we observed the new chiller and its operation as well as collected its running data from its start up to the current day.

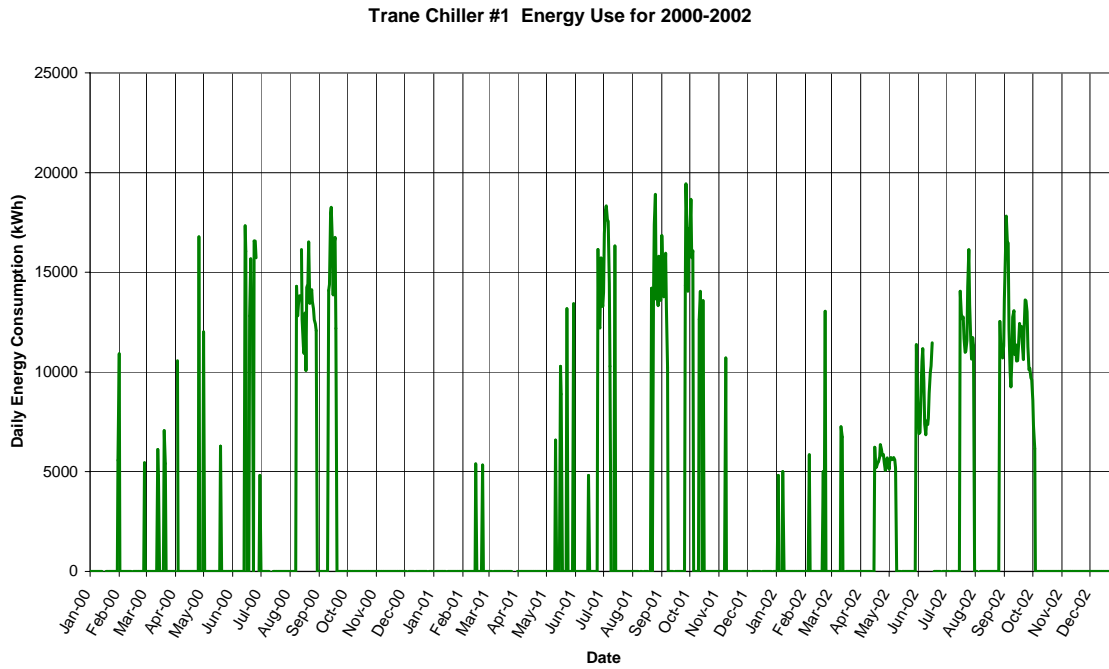
Preliminary Load Profiles

We were given historical data of the energy consumption and operation behavior of all chillers in the form of hourly operating cooling loads. This load data, along with part-load efficiency curves, were used to determine the energy consumption for each chiller.

The daily energy consumptions of the three chillers are plotted on the three following charts. The fourth chart provides the sum of the consumptions of the three chillers.

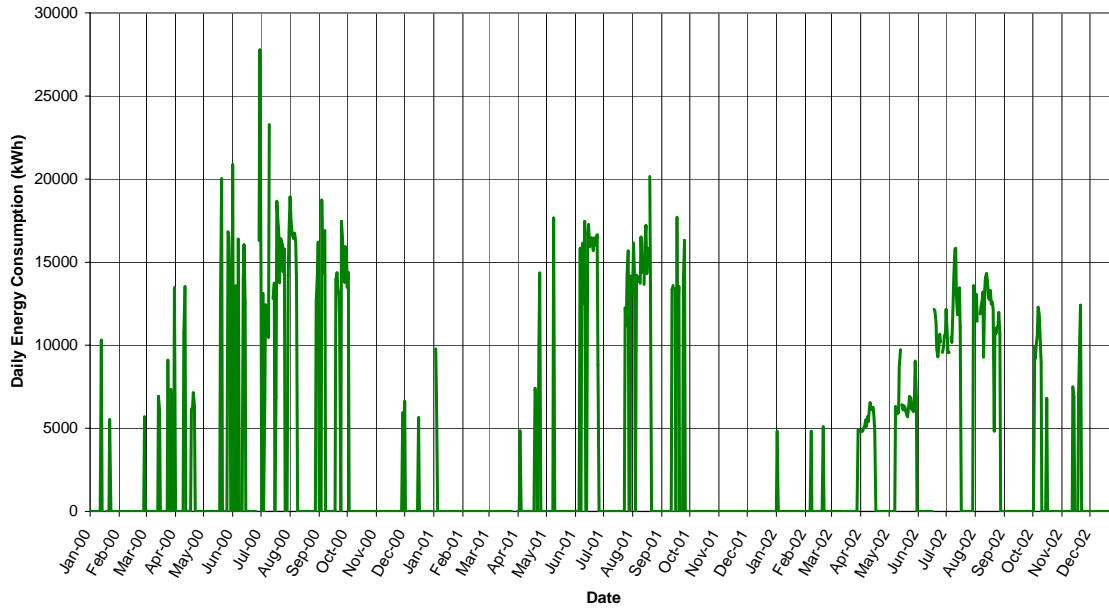
We estimate the chillers consumed 10,181,317 kWh during the three-year period from January 1, 2000, through December 31, 2002. This equates to an average annual consumption of 3,393,772 kWh.

Trane Chiller #1 (1200-ton): This chiller is located next to a second chiller in the central plant of the medical center. Its historical operation was noted and analyzed based on part-load curves from Trane, the chiller manufacturer. During the three year period the chiller consumed approximately 2,375,916 kWh. Its energy consumption profile from the beginning of 2000 to the end 2002 is shown bellow.



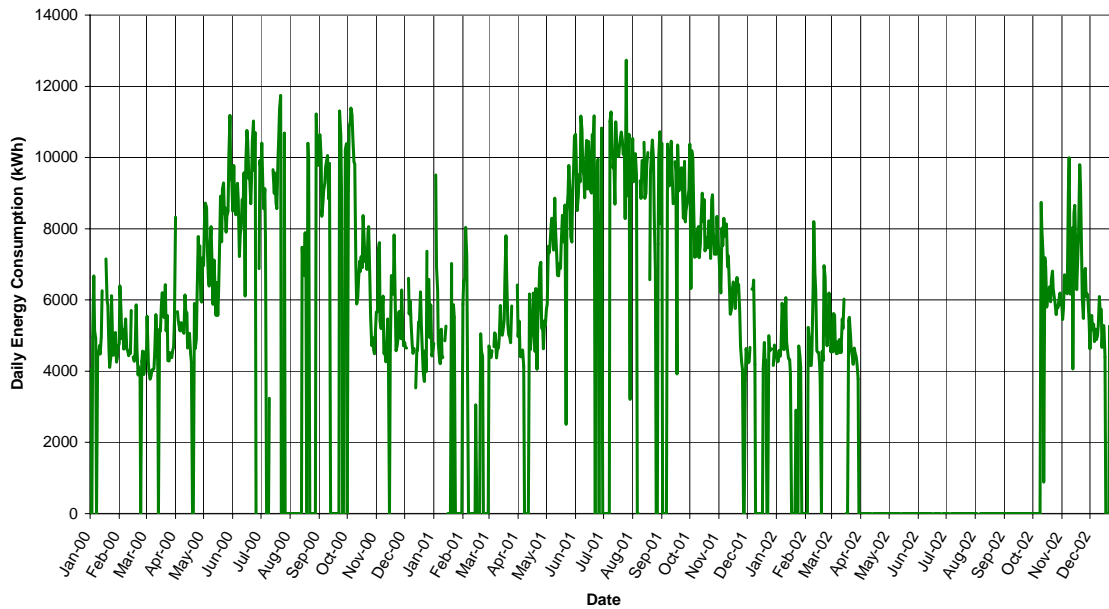
Trane Chiller #2 (1200-ton): This chiller is located next to the first chiller in the central plant of the medical center. Its historical operation was noted and analyzed based on part-load curves from Trane, the chiller manufacturer. During the three year period the chiller consumed an approximate 2,904,607 kWh. Its energy consumption profile from the beginning of 2000 to the end 2002 is shown bellow.

Trane Chiller #2 Energy Use for 2000-2002



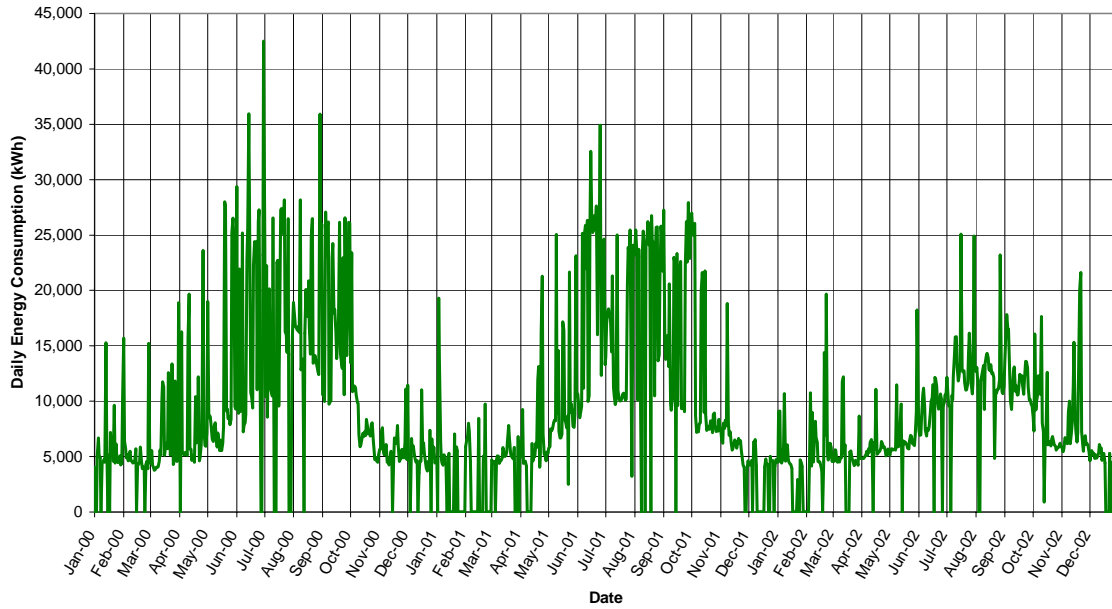
York Chiller (750-ton): This chiller is located in a separate room from the other chillers in the central plant of the medical center. Its historical operation was noted and analyzed based on part-load curves from York, the chiller manufacturer. During the three year period the chiller consumed an approximate 4,900,794 kWh. Its energy consumption profile from the beginning of 2000 to the end 2002 is shown on the following page.

York Chiller Energy Use for 2000-2002



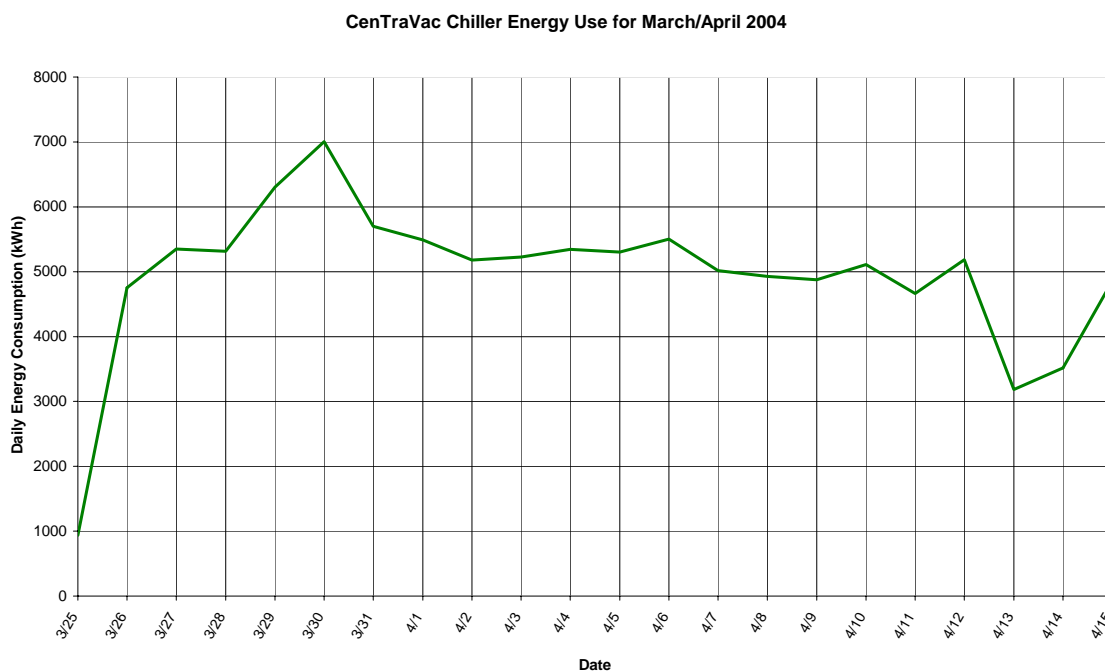
Profile Sum of All Chillers: Adding the energy used by all the chillers for the three year period, the following load profile was attained. During this period the chillers consumed an estimated 10,181,317 kWh.

Energy Used by All Chillers for 2000-2002



New Chiller Operations

Trane Chiller #1 was removed from its location and the 1200-ton CenTraVac chiller was put in its place. The chiller was set into operation on March 25, 2004. Data was collected from March 25 to April 15. During this period the chiller consumed an approximate 108,734 kWh. Its energy consumption profile is shown bellow.



The CenTraVac chiller was installed to operate as the sole lead chiller. (Prior to its installation, the chillers alternated “lead” operation.) The remaining two chillers (one 1200-ton Trane and one 750-ton York) operate only when the cooling load exceeds 1200 tons or the CenTraVac is under maintenance. Central Plant operating data since the CenTraVac’s installation show that it has been the only chiller operating.

Furthermore, during the 2000-2002 operating period, the maximum cooling demand of the system was 1,127 tons on August 18, 2000. This supports the assumption that the vast majority of the medical center’s cooling load will be met by the CenTraVac chiller without need for the older chillers to operate.

We therefore calculated the energy that the new chiller would have consumed had it been operating as sole chiller (but supplemented by the direct-exchange cooling tower) during 2000-2002. This was calculated by applying the cooling load profile to the partial load efficiency curve of the CenTraVac.

Energy Savings Calculations

The following table demonstrates the savings of the CenTraVac chiller if it is used to replace the operation of all chillers. The savings show a reduction of 4,068,531 kWh for the three year period. This equates to energy savings of approximately 1,356,177 kWh per year.

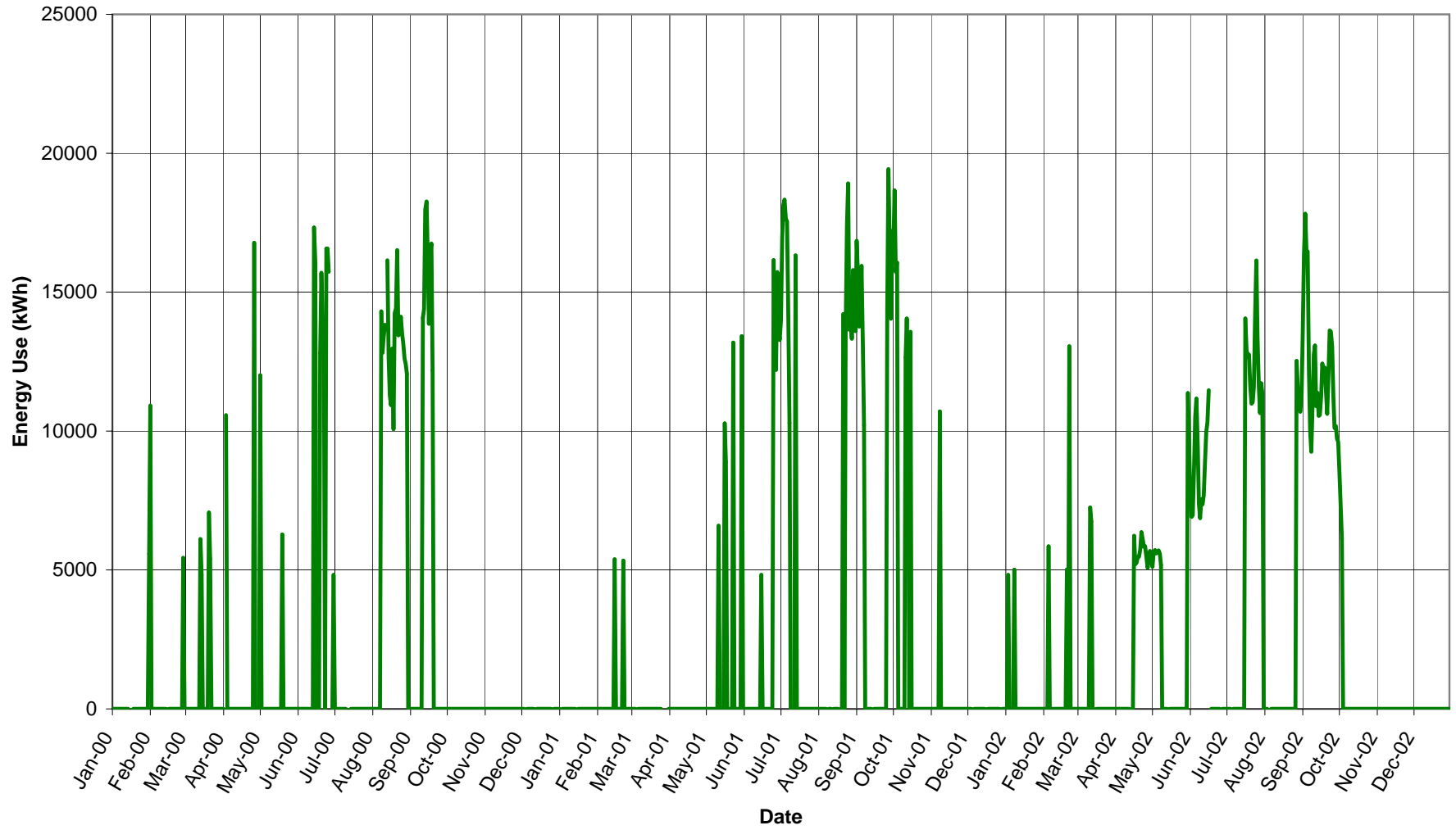
New Chiller Savings Analysis			
	All Chillers (kWh)	CenTraVac Chiller (kWh)	Savings (kWh)
2000 Data	3,739,595	2,197,687	1,541,908
2001 Data	3,646,609	2,049,221	1,597,388
2002 Data	2,795,113	1,865,878	929,235
TOTAL	10,181,317	6,112,786	4,068,531
Average	3,393,772	2,037,595	1,356,177

This 1,356,177 kWh per year is the *ex-post* energy savings, based on the assumption that the three-year period of 2000-2002 represents typical weather and facility operations.

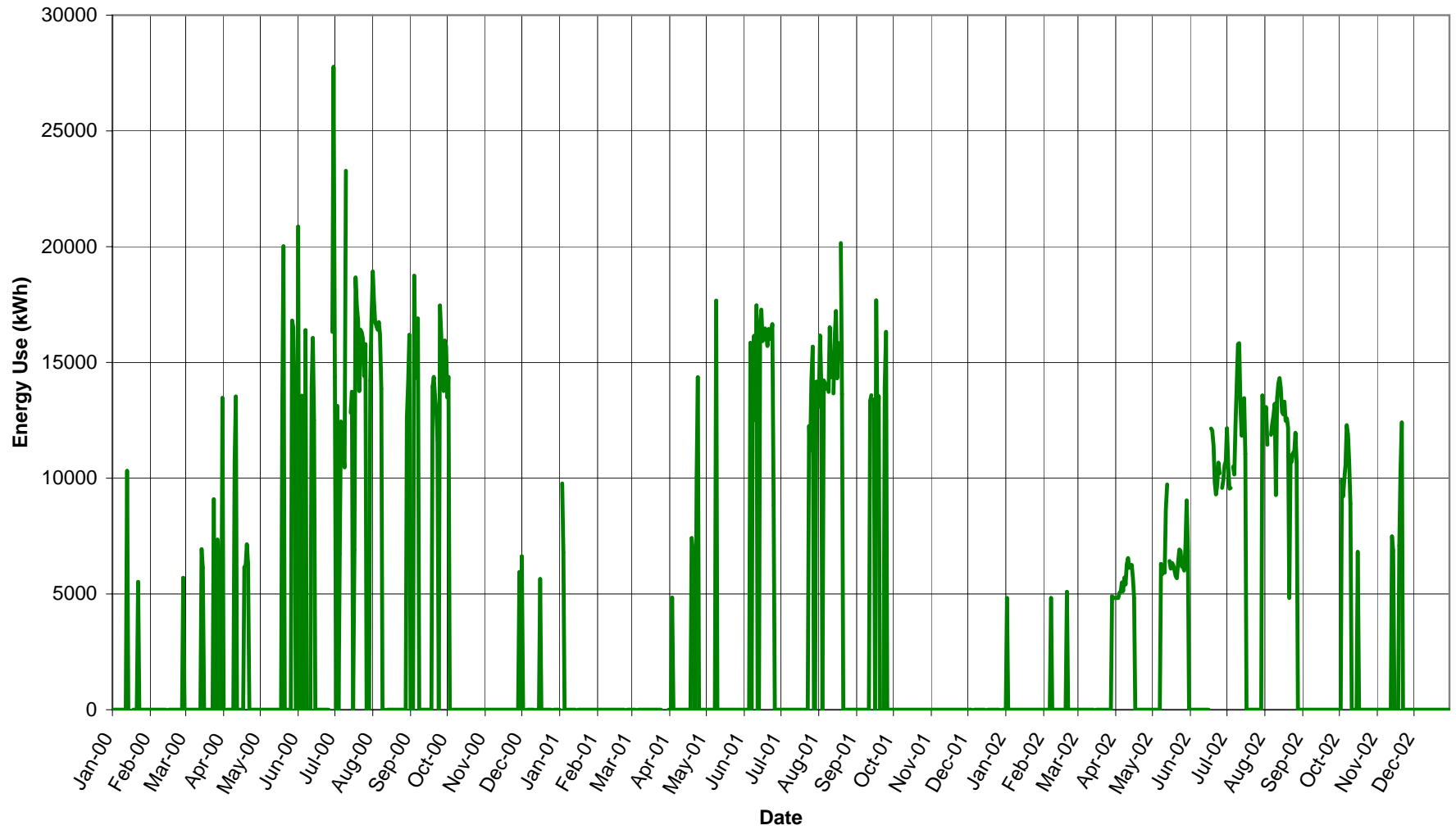
The county's savings estimate was 954,267 kWh/year. This is the same as the *ex-ante* verified estimate because the program proposed the installation of one chiller and one chiller was in fact installed.

Following are larger versions of the daily load profiles for the three old chillers and their combined total.

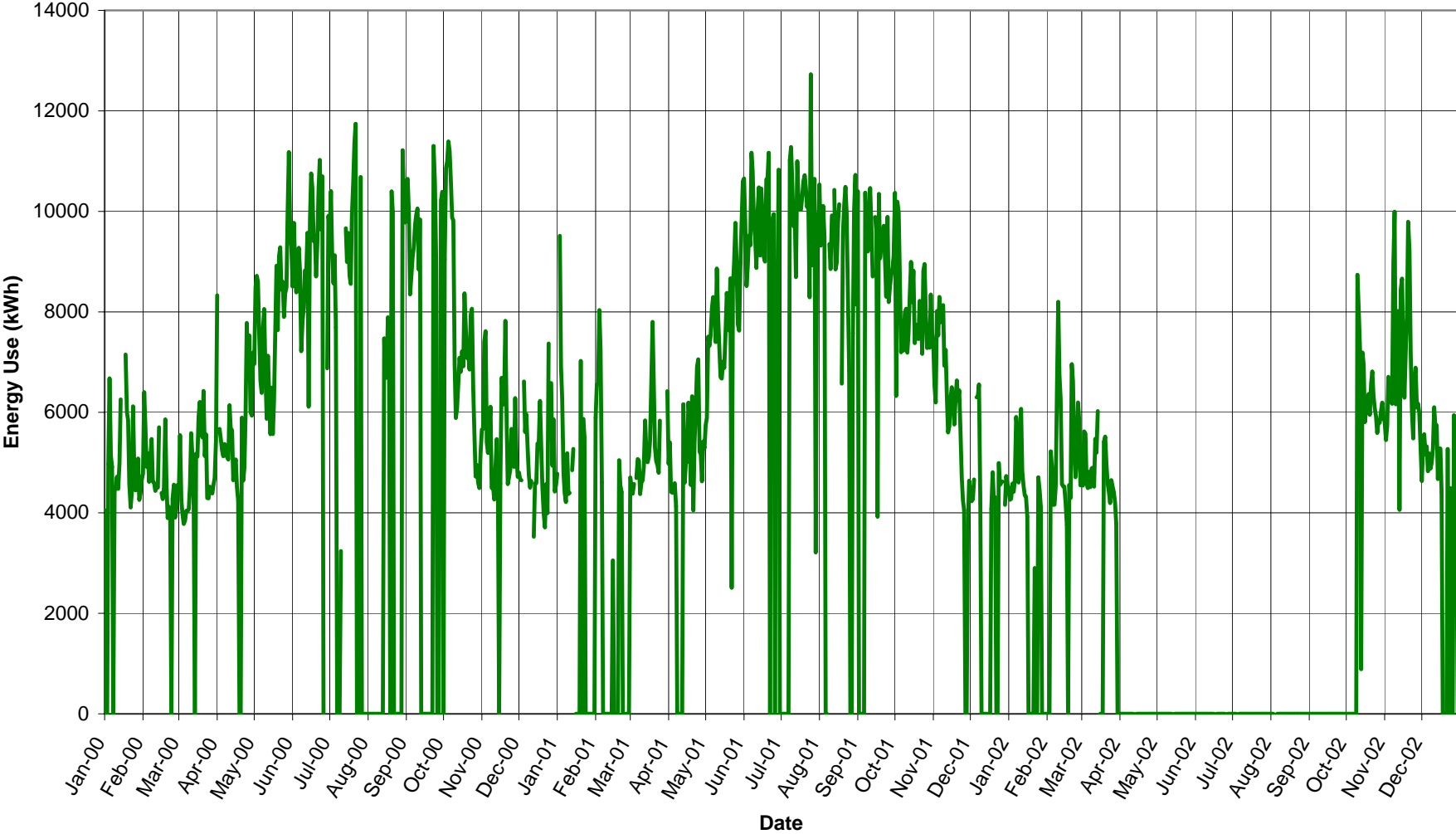
Trane Chiller #1 Energy Use for 2000-2002



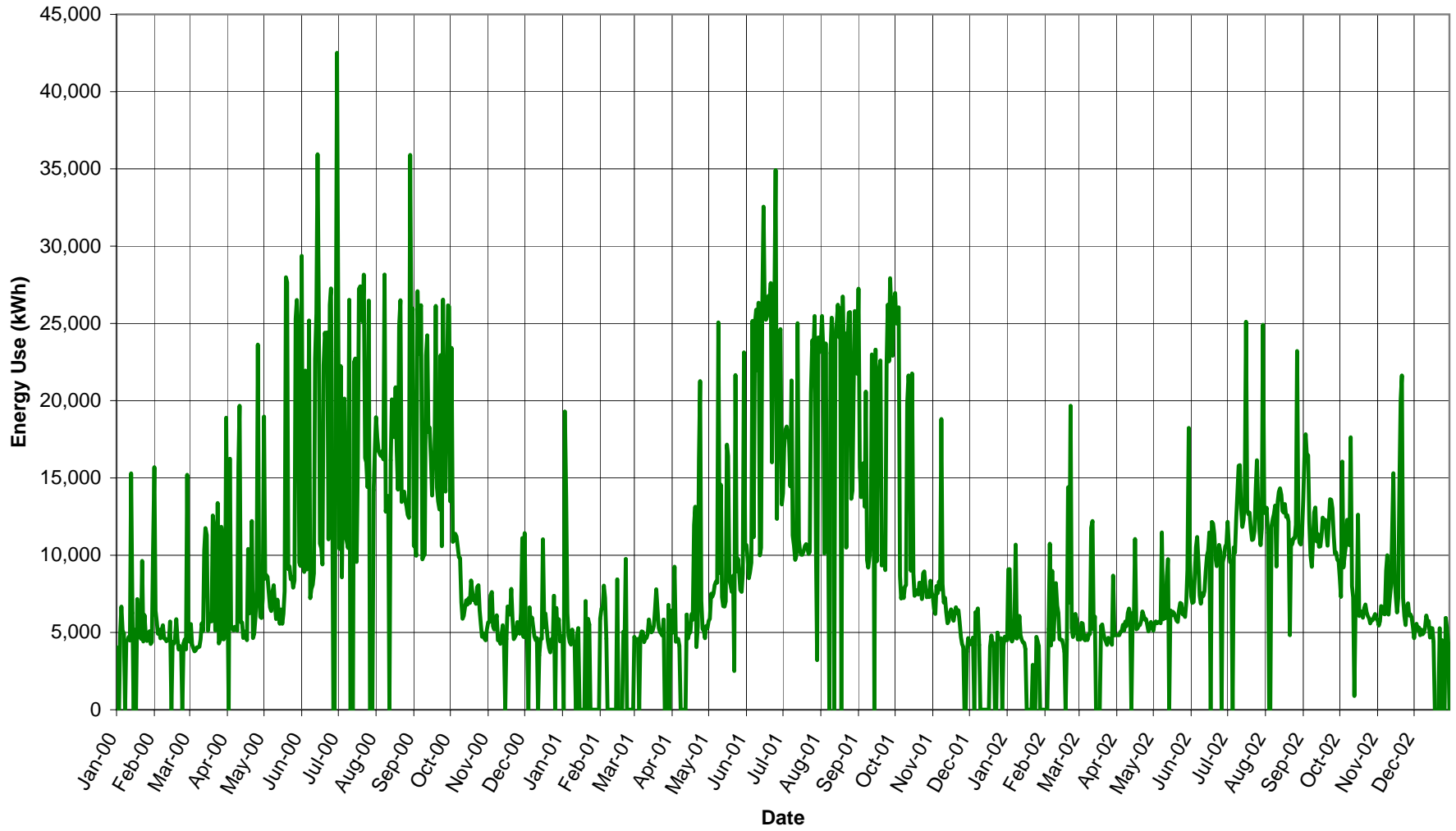
Trane Chiller #2 Energy Use for 2000-2002



York Chiller Energy Use for 2000-2002



Energy Used by All Chillers for 2000-2002



Harbor UCLA Medical Center – 1000 W. Carson St.



480 V Panel in Boiler Motor Room



4160 V Panel for Chillers



Control Panel in CRU-1 and CRU-2 Room



CRU-1 and CRU-2 Chiller Room View



Trane CRU-1 Chiller



Trane CRU-1 Controls

Harbor UCLA Medical Center – 1000 W. Carson St.



Trane CRU-2 Chiller



Trane CRU-2 Controls



York 750 Chiller



York 750 Control Panel

Harbor UCLA Medical Center – 1000 W. Carson St.



New Chiller (Left Side)



New Chiller (Right Side)



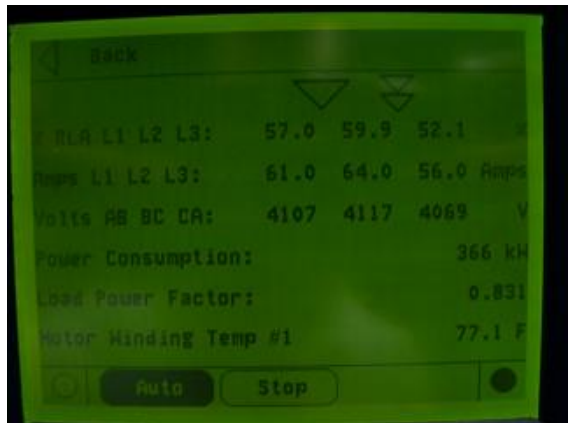
New Chiller 25hp Motor



New Chiller 25hp Motor Nameplate



New Chiller Control Panel



New Chiller Running Detail