ENERGY SAVINGS PLAN

SUBMITTED BY:
DCO Energy Efficiency Division
100 Lenox Drive
Suite 100
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Rev 3 – 10/13/2016

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DCO Energy Efficiency Division
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ENERGY SAVINGS PLAN

SECTION 1 – PROJECT OVERVIEW

PROJECT OVERVIEW

The Energy Savings Plan (ESP) is the core of the Energy Savings Improvement Plan (ESIP) process. It describes County of Ocean preferred Energy Conservation Measures (ECMs), the budget cost for each ECM and the ECM energy savings calculations that self-fund the project via reduced operating costs. The ESP provides County of Ocean the necessary information to decide which proposed ECMs to implement as part of your (ESIP) project. Working with the County's staff, your selected ESIP project would:

1. Self-fund a $15,878,469 project
2. Generate $750,658 in annual energy savings
3. Qualify for $628,683 in *Pay for Performance (P4P)* incentives & Direct Install Incentives as well as $1,100,000 in CHP Incentives

NOTE: This submitted ESP doesn't constitute any contractual obligation between County of Ocean and DCO Energy (DCO). Any contractual obligations will be performed under separate legal documents per mutual signed agreement of the parties involved and subject to the applicable laws and requirements of the ESIP legislation and State of New Jersey.

To ensure conformance with the requirements of Public Finance Notice LFN 2009-11, the ESP must address the following elements:

- *The results of the energy audit; (APPENDIX I)*
- *A description of the energy conservation measures that will comprise the program; (Section 3)*
- *An estimate of greenhouse gas reductions resulting from those energy savings; (Section 3);*
- *Identification of design and compliance issues and identification of who will provide these services; (Section 5)*
- *An assessment of risks involved in the successful implementation of the plan; (Section 5)*
- *Identify the eligibility for, and costs and revenues associated with the PJM Independent System Operator for demand response and curtailable service activities; (Section 7)*

- *Schedules showing calculations of costs of implementing the proposed energy conservation measures and the projected energy savings; (Section 3)*
- *Maintenance requirements necessary to ensure continued energy savings, and describe how they will be provided; and (Section 6)*
- *If developed by an ESCO, a description of, and cost estimates of a proposed energy savings guarantee. (Section 7)*

In addition, and per LFN 2009-11, the ESP requires several other important elements:

- *The calculations of energy savings must be made in accordance with protocols for their calculation adopted by the BPU. The calculation shall include applicable State and Federal rebates and tax credits, but shall not include the cost of an energy audit and the cost of verifying energy savings. (Section 3)*
- *An independent third party must review the plan and certify that the plan savings were properly calculated pursuant to the BPU protocols.*
- *If an ESCO is used to prepare the plan, the ESCO must provide an estimate of the cost of a guarantee of energy savings. When adopting the plan, the local unit must decide whether or not to accept the guarantee (covered below). (Section 7)*
- *The plan must be verified by an independent third party to ensure that the calculations were made in accordance with the BPU standards and that required elements of the ESP are covered.*
- *After verification is completed, the governing body must formally adopt the plan. At that point, the plan must be submitted to the Board of Public Utilities where it will be posted on the BPU website. BPU approval is not required. If the contracting unit maintains its own website, the plan must also be posted on that site.*

DCO Energy looks forward to the third-party review of our energy calculations and County of Ocean approval of the Energy Savings Plan to implement via the requirements of the ESIP legislation. Your time, effort, and support are appreciated.

ENERGY SAVINGS PLAN

SECTION 2 – COUNTY OF OCEAN BASELINE

Total Utility Consumption and Site EUI

The Ocean County Energy Savings Plan includes 6 Buildings as well as the Parking Garage Lighting. To develop the ESP, DCO Energy was provided with utility data (Electric, Natural Gas, Fuel Oil, & Water) by Ocean County. DCO Energy tracked and documented this utility data from April 2014 to March 2015. A listing of the buildings, the total utility consumption, and Energy Usage Index for the 6 Buildings and Parking Garage are detailed below.

BUILDING NAME	SIZE	ELECTRIC			
	Sq Ft	Usage kWh	Demand kW	Usage kWh / SqFt	Total Cost $
Court House	108,800	1,862,471	458	17.12	$234,373
Administration Building	45,500	1,693,800	333	37.23	$215,014
New Jail	168,000	2,499,932	519	14.88	$288,008
Prosecutor's Office	32,205	353,600	148	10.98	$44,730
Justice Complex	163,600	4,079,691	756	24.94	$459,897
P.E.E.R. Building/Parking Garage	504,670	1,666,880	319	3.30	$193,337
TOTALS	1,022,775	12,156,374	2,532	11.89	$1,435,358

BUILDING NAME	SIZE	NATURAL GAS		
	Sq Ft	Usage Therms	Usage Therms / Sq Ft	Cost $
Court House	108,800	33,290	0.31	$41,844
Administration Building	45,500	30,590	0.67	$36,503
New Jail	168,000	57,708	0.34	$68,255
Prosecutor's Office	32,205	11,230	0.35	$15,498
Justice Complex	163,600	371,466	2.27	$363,381
P.E.E.R. Building/Parking Garage	504,670	41,837	0.08	$50,631
TOTALS	1,022,775	546,120	0.53	$576,112

BUILDING NAME	SIZE	Domestic Water kGal	
	Sq Ft	Usage Domestic Water kGal	Cost $
Court House	108,800	5,546	$41,473
Administration Building	45,500	1,659	$16,185
New Jail	168,000	1,607	$15,433
Prosecutor's Office	32,205	267	$2,708
Justice Complex	163,600	35,140	$247,388
P.E.E.R. Building/Parking Garage	504,670	682	$7,083
TOTALS	1,022,775	44,901	$330,271

BUILDING NAME	SIZE	TOTAL ENERGY	SITE EUI	
	Sq Ft	Usage BTUs	Usage BTU / Sq Ft	Cost $ / Sq Ft
Court House	108,800	9,683,754,502	89,005	$2.92
Administration Building	45,500	8,838,271,760	194,248	$5.88
New Jail	168,000	14,300,547,804	85,122	$2.21
Prosecutor's Office	32,205	2,329,460,890	72,332	$1.95
Justice Complex	163,600	51,066,478,182	312,142	$6.54
P.E.E.R. Building/Parking Garage	504,670	9,871,047,290	19,559	$0.50
TOTALS	1,022,775	96,089,560,428	93,950	$2.29

On the following pages is a detailed account of each of the utility accounts and meters provided to DCO Energy.

DCO Energy Efficiency Division
100 Lenox Drive, Suite 100
Lawrenceville, NJ 08648

Court House

Court House	Electric Meter #1								
	Provider:	JCP&L			10007422278		Meter #	L013639669	
	Commodity:						Meter #		
Month / Year	Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Total Charges	Cost / kWh Checksum	Days	Load Factor	BTU
Apr-14	3/1/2014	4/1/2014	107,604	264	$21,374	$0.199	32	53%	367,144,848
May-14	4/2/2014	5/1/2014	120,070	354	$17,375	$0.145	30	47%	409,678,840
Jun-14	5/2/2014	6/1/2014	156,774	366	$20,061	$0.128	31	58%	534,912,888
Jul-14	6/2/2014	7/1/2014	182,369	422	$22,762	$0.125	30	60%	622,243,028
Aug-14	7/2/2014	8/1/2014	206,319	458	$25,060	$0.121	31	61%	703,960,428
Sep-14	8/2/2014	9/1/2014	179,499	395	$19,855	$0.111	31	61%	612,450,588
Oct-14	9/2/2014	10/1/2014	178,681	428	$20,412	$0.114	30	58%	609,659,572
Nov-14	10/2/2014	11/1/2014	170,712	357	$19,470	$0.114	31	64%	582,469,344
Dec-14	11/2/2014	12/1/2014	117,230	351	$16,327	$0.139	30	46%	399,988,760
Jan-15	12/2/2014	1/1/2015	113,422	261	$14,945	$0.132	31	58%	386,995,864
Feb-15	1/2/2015	2/1/2015	106,378	256	$15,760	$0.148	31	56%	362,961,736
Mar-15	2/2/2015	3/1/2015	223,413	291	$20,972	$0.094	28	114%	762,285,156
Total			1,862,471	458	$234,373	$0.126	366	46%	6,354,751,052

Court House								
Natural Gas Meter #1								
Provider:	NJNG		Account #	194510004317			Meter #	114857
Commodity:			Account #				Meter #	
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Commodity Charges	Gas Total Charges	Cost / Unit Checksum	BTU	
3/26/2014	4/22/2014	3,093	$1,978	$1,979	$3,957	$1.28	661,238,000	
4/23/2014	5/23/2014	578	$736	$363	$1,099	$1.90	706,234,000	
5/24/2014	6/25/2014	317	$1,058	$199	$1,257	$3.96	668,610,000	
6/26/2014	7/25/2014	5	$453	$3	$456	$95.52	600,601,000	
7/26/2014	8/23/2014	0	$450	$0	$450	#DIV/0!	309,324,000	
8/24/2014	9/22/2014	1	$451	$1	$452	$376.32	15,379,000	
9/23/2014	10/21/2014	313	$597	$196	$793	$2.54	16,371,000	
10/22/2014	11/20/2014	4,097	$2,329	$2,581	$4,910	$1.20	477,000	
11/21/2014	12/23/2014	5,811	$3,115	$3,643	$6,758	$1.16	0	
12/24/2014	1/22/2015	5,438	$2,944	$3,409	$6,353	$1.17	120,000	
1/23/2015	2/26/2015	8,398	$4,302	$5,264	$9,566	$1.14	31,283,000	
2/27/2015	3/24/2015	5,238	$2,852	$2,939	$5,792	$1.11	409,664,000	
		33,290	21,266	$20,578	$41,844	$1.26	3,419,301,000	

Court House						
Domestic Water kGal						
Provider:	United Water		Account #	0440627001000	Meter #	
Billing Period Start Date	**Actual Reading**	**Domestic Water kGal**	**$**	**Cost / Unit Checksum**	**BTU**	
6/1/2013	12/31/2013	1122.0000	$ 8,504.82	$7.58	0	
1/1/2014	12/31/2014	4188.0000	$ 31,108.15	$7.43	0	
1/1/2015	2/28/2015	236.0000	$ 1,859.70	$7.88	0	
3/1/2015				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
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1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
		5,546	$41,473	$7.48	0	

Administration Building

Administration Building	**Electric Meter #1**								
	Provider:	JCP&L			100017422328		Meter #	S310476088	
	Commodity:						Meter #		
Month / Year	**Billing Period Start Date**	**Actual Reading**	**Usage kWh**	**Demand kW**	**Electric Total Charges**	**Cost / kWh Checksum**	**Days**	**Load Factor**	**BTU**
Apr-14	3/2/2014	4/1/2014	117,000	267	$13,407	$0.115	31	59%	399,204,000
May-14	4/2/2014	5/1/2014	113,160	192	$15,526	$0.137	30	82%	386,101,920
Jun-14	5/2/2014	6/1/2014	98,160	186	$20,752	$0.211	31	71%	334,921,920
Jul-14	6/2/2014	7/1/2014	105,360	189	$21,991	$0.209	30	77%	359,488,320
Aug-14	7/2/2014	8/1/2014	117,720	297	$22,274	$0.189	31	53%	401,660,640
Sep-14	8/2/2014	9/1/2014	158,040	321	$25,619	$0.162	31	66%	539,232,480
Oct-14	9/2/2014	10/1/2014	167,640	333	$20,447	$0.122	30	70%	571,987,680
Nov-14	10/2/2014	11/1/2014	171,120	315	$18,028	$0.105	31	73%	583,861,440
Dec-14	11/2/2014	12/1/2014	198,960	328	$17,209	$0.086	30	84%	678,851,520
Jan-15	12/2/2014	1/1/2015	164,520	317	$13,826	$0.084	31	70%	561,342,240
Feb-15	1/2/2015	2/1/2015	144,120	305	$12,125	$0.084	31	64%	491,737,440
Mar-15	2/2/2015	3/1/2015	138,000	279	$13,811	$0.100	28	74%	470,856,000
Total			1,693,800	333	$215,014	$0.127	365	58%	5,779,245,600

Administration Building							
Natural Gas Meter #1							
Provider:	NJNG		Account #	194510020510		Meter #	114856
Commodity:			Account #			Meter #	
Billing Period Start Date	**Actual Reading**	**Therms**	**Gas Delivery Charges**	**Gas Commodity Charges**	**Gas Total Charges**	**Cost / Unit Checksum**	**BTU**
3/26/2014	4/22/2014	1,417	$935	$907	$1,842	$1.30	298,418,000
4/23/2014	5/23/2014	2,407	$1,472	$1,513	$2,985	$1.24	332,647,000
5/24/2014	6/25/2014	2,721	$1,580	$1,706	$3,286	$1.21	276,356,000
6/26/2014	7/25/2014	2,657	$1,548	$1,666	$3,214	$1.21	251,754,000
7/26/2014	8/23/2014	2,508	$1,474	$1,572	$3,046	$1.21	141,669,000
8/24/2014	9/22/2014	2,417	$1,430	$1,515	$2,945	$1.22	240,750,000
9/23/2014	10/21/2014	2,565	$1,439	$1,608	$3,047	$1.19	272,134,000
10/22/2014	11/20/2014	2,513	$1,389	$1,583	$2,972	$1.18	265,707,000
11/21/2014	12/23/2014	2,568	$1,414	$1,610	$3,024	$1.18	250,790,000
12/24/2014	1/22/2015	2,794	$1,517	$1,751	$3,268	$1.17	241,746,000
1/23/2015	2/26/2015	3,984	$2,063	$2,497	$4,560	$1.14	256,505,000
2/27/2015	3/24/2015	2,038	$1,170	$1,144	$2,314	$1.14	251,348,000
		30,590	$17,431	$19,071	$36,503	$1.19	3,079,824,000

Administration Building						
Domestic Water kGal						
Provider:	United Water		Account #	04402498900000	Meter #	
Billing Period Start Date	**Actual Reading**	**Domestic Water kGal**	**$**	**Cost / Unit Checksum**	**BTU**	
6/1/2013	12/31/2013	734.0000	$ 6,681.91	$9.10	0	
1/1/2014	12/31/2014	840.0000	$ 8,269.14	$9.84	0	
1/1/2015	2/28/2015	85.0000	$ 1,234.32	$14.52	0	
3/1/2015				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
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1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
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1/1/1900				#DIV/0!	0	
		1,659	$16,185	$9.76	0	

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New Jail

New Jail	Electric Meter #1										
	Provider:	JCP&L			Account #	100076240165			Meter #	L013649433	
	Commodity:				Account #				Meter #		
Month / Year	**Billing Period Start Date**	**Actual Reading**	**Usage kWh**	**Demand kW**	**Electric Delivery Charges**	**Electric Commodity Charges**	**Electric Total Charges**	**Cost / kWh Checksum**	**Days**	**Load Factor**	**BTU**
May-14	3/29/2014	4/28/2014	193,893	356	$5,275	$16,893	$22,168	$0.114	31	73%	661,562,916
Jun-14	4/29/2014	5/28/2014	205,372	433	$6,149	$17,893	$24,042	$0.117	30	66%	700,729,264
Jul-14	5/29/2014	6/27/2014	236,711	483	$6,974	$20,623	$27,597	$0.117	30	68%	807,657,932
Aug-14	6/28/2014	7/29/2014	280,195	519	$7,891	$24,412	$32,302	$0.115	32	70%	956,025,340
Sep-14	7/30/2014	8/27/2014	236,161	459	$6,799	$20,575	$27,374	$0.116	29	74%	805,781,332
Oct-14	8/28/2014	9/26/2014	234,897	514	$7,084	$20,465	$27,549	$0.117	30	63%	801,468,564
Nov-14	9/27/2014	10/28/2014	212,930	400	$5,936	$18,551	$24,487	$0.115	32	69%	726,517,160
Dec-14	10/29/2014	11/26/2014	175,621	330	$4,885	$15,301	$20,185	$0.115	29	76%	599,218,852
Jan-15	11/27/2014	12/29/2014	186,385	284	$4,755	$16,215	$20,971	$0.113	33	83%	635,945,620
Feb-15	12/30/2014	1/28/2015	168,571	285	$4,482	$14,687	$19,168	$0.114	30	82%	575,164,252
Mar-15	1/29/2015	2/28/2015	184,138	301	$4,988	$16,020	$21,008	$0.114	31	82%	628,278,856
Apr-15	3/1/2015	3/30/2015	185,058	301	$5,032	$16,123	$21,155	$0.114	30	85%	631,417,896
Total			**2,499,932**	**519**	**$70,250**	**$217,757**	**$288,008**	**$0.115**	**367**	**55%**	**8,529,767,984**

New Jail							
Natural Gas Meter #1							
Provider:	NJNG		Account #	194611193014		Meter #	99725
Commodity:			Account #			Meter #	
Billing Period Start Date	**Actual Reading**	**Therms**	**Gas Delivery Charges**	**Gas Commodity Charges**	**Gas Total Charges**	**Cost / Unit Checksum**	**BTU**
3/26/2014	4/22/2014	2,703	$1,750	$1,730	$3,480	$1.29	591,501,000
4/23/2014	5/23/2014	3,944	$2,363	$2,479	$4,842	$1.23	578,375,000
5/24/2014	6/25/2014	5,774	$3,266	$3,619	$6,886	$1.19	535,525,000
6/26/2014	7/25/2014	2,986	$1,890	$1,872	$3,761	$1.26	514,620,000
7/26/2014	8/23/2014	3,878	$2,331	$2,431	$4,762	$1.23	270,337,000
8/24/2014	9/22/2014	4,052	$2,416	$2,540	$4,956	$1.22	394,362,000
9/23/2014	10/21/2014	6,313	$3,377	$3,957	$7,335	$1.16	577,372,000
10/22/2014	11/20/2014	4,341	$2,406	$2,735	$5,141	$1.18	298,570,000
11/21/2014	12/23/2014	4,926	$2,674	$3,088	$5,762	$1.17	387,840,000
12/24/2014	1/22/2015	5,635	$3,000	$3,532	$6,532	$1.16	401,567,000
1/23/2015	2/26/2015	8,410	$4,272	$5,271	$9,543	$1.13	631,345,000
2/27/2015	3/24/2015	4,746	$2,592	$2,663	$5,255	$1.11	434,096,000
		57,708	$32,337	$35,917	$68,255	$1.18	5,615,510,000

New Jail					
Domestic Water kGal					
Provider:	United Water		Account #	04405498900000	Meter #

Billing Period Start Date	Actual Reading	Domestic Water kGal	$	Cost / Unit Checksum	BTU
6/1/2013	12/31/2013	577.000	$5,402.21	$9.36	0
1/1/2014	12/31/2014	976	$9,234	$9.46	0
1/1/2015	2/28/2015	54	$797	$14.76	0
3/1/2015				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
		1,607	$15,433	$9.60	0

Prosecutor's Office

Prosecutor's Office	**Electric Meter #1**								
	Provider:	JCP&L			100016670471		Meter #	G28509868	
	Commodity:						Meter #		
Month / Year	**Billing Period Start Date**	**Actual Reading**	**Usage kWh**	**Demand kW**	**Electric Total Charges**	**Cost / kWh Checksum**	**Days**	**Load Factor**	**BTU**
May-14	4/1/2014	5/1/2014	24,640	99	$3,151	$0.128	31	33%	84,071,680
Jun-14	5/2/2014	6/1/2014	31,040	125	$4,030	$0.130	31	34%	105,908,480
Jul-14	6/2/2014	7/1/2014	48,000	148	$5,924	$0.123	30	45%	163,776,000
Aug-14	7/2/2014	8/1/2014	24,320	131	$3,389	$0.139	31	25%	82,979,840
Sep-14	8/2/2014	9/1/2014	34,560	131	$4,447	$0.129	31	35%	117,918,720
Oct-14	9/2/2014	10/1/2014	30,720	103	$3,818	$0.124	30	41%	104,816,640
Nov-14	10/2/2014	11/1/2014	28,160	110	$3,595	$0.128	31	34%	96,081,920
Dec-14	11/2/2014	12/1/2014	24,640	88	$3,091	$0.125	30	39%	84,071,680
Jan-15	12/2/2014	1/1/2015	24,320	82	$3,015	$0.124	31	40%	82,979,840
Feb-15	1/2/2015	2/1/2015	28,800	84	$3,498	$0.121	31	46%	98,265,600
Mar-15	2/2/2015	3/1/2015	28,800	88	$3,547	$0.123	28	49%	98,265,600
Apr-15	3/2/2015	4/1/2015	25,600	93	$3,225	$0.126	31	37%	87,347,200
Total			353,600	148	$44,730	$0.126	366	27%	1,206,483,200

Prosecutor's Office							
Natural Gas Meter #1							
Provider:	NJNG		Account #	194510709114		Meter #	328553
Commodity:			Account #			Meter #	
Billing Period Start Date	**Actual Reading**	**Therms**	**Gas Delivery Charges**	**Gas Commodity Charges**	**Gas Total Charges**	**Cost / Unit Checksum**	**BTU**
3/26/2014	4/22/2014	855	$686	$547	$1,234	$1.44	65,757,000
4/23/2014	5/23/2014	816	$720	$513	$1,233	$1.51	175,917,000
5/24/2014	6/25/2014	550	$536	$345	$880	$1.60	201,721,000
6/26/2014	7/25/2014	522	$522	$327	$849	$1.63	149,615,000
7/26/2014	8/23/2014	533	$527	$334	$861	$1.62	152,093,000
8/24/2014	9/22/2014	515	$519	$323	$841	$1.63	85,509,000
9/23/2014	10/21/2014	693	$589	$434	$1,024	$1.48	81,594,000
10/22/2014	11/20/2014	864	$661	$545	$1,205	$1.39	52,457,000
11/21/2014	12/23/2014	1,257	$841	$788	$1,629	$1.30	53,642,000
12/24/2014	1/22/2015	1,509	$956	$946	$1,903	$1.26	51,487,000
1/23/2015	2/26/2015	2,037	$1,199	$1,277	$2,476	$1.22	69,368,000
2/27/2015	3/24/2015	1,078	$759	$605	$1,364	$1.26	86,710,000
		11,230	$8,514	$6,983	$15,498	$1.38	1,225,870,000

Prosecutor's Office					
Domestic Water kGal					
Provider:	United Water	Account #	04403498900000	Meter #	
Billing Period Start Date	**Actual Reading**	**Domestic Water kGal**	**$**	**Cost / Unit Checksum**	**BTU**
6/1/2013	12/31/2013	79.000	$832.49	$10.54	0
1/1/2014	12/31/2014	159.000	$1,592.49	$10.02	0
1/1/2015	2/28/2015	29.000	$282.94	$9.76	0
3/1/2015				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
1/1/1900				#DIV/0!	0
		267	$2,708	$10.14	0

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Justice Complex

Justice Complex	Electric Meter #1								
	Provider:	JCP&L			100017910215		Meter #	L97024394	
	Commodity:						Meter #		
Month / Year	Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Total Charges	Cost / kWh Checksum	Days	Load Factor	BTU
Feb-13	4/1/2014	5/1/2014	308,747	650	$35,074	$0.114	31	64%	1,053,444,764
Mar-13	5/2/2014	6/1/2014	406,604	719	$41,671	$0.102	31	76%	1,387,332,848
Apr-13	6/2/2014	7/1/2014	412,406	756	$45,417	$0.110	30	76%	1,407,129,272
May-13	7/2/2014	8/1/2014	430,496	706	$40,404	$0.094	31	82%	1,468,852,352
Jun-13	8/2/2014	9/1/2014	405,334	721	$40,535	$0.100	31	76%	1,382,999,608
Jul-13	9/2/2014	10/1/2014	394,273	700	$36,865	$0.094	30	78%	1,345,259,476
Aug-13	10/2/2014	11/1/2014	314,198	690	$34,076	$0.108	31	61%	1,072,043,576
Sep-13	11/2/2014	12/1/2014	255,715	482	$29,422	$0.115	30	74%	872,499,580
Oct-13	12/2/2014	1/1/2015	274,985	471	$31,139	$0.113	31	78%	938,248,820
Nov-13	1/2/2015	2/1/2015	298,179	473	$37,184	$0.125	31	85%	1,017,386,748
Dec-13	2/2/2015	3/1/2015	284,265	511	$43,276	$0.152	28	83%	969,912,180
Jan-14	3/2/2015	4/1/2015	294,489	614	$44,833	$0.152	31	64%	1,004,796,468
Total			4,079,691	756	$459,897	$0.113	366	61%	13,919,905,692

Justice Complex								
Natural Gas Meter #1								
Provider:	NJNG		Account #	194510004712			Meter #	376468
Commodity:			Account #				Meter #	
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Commodity Charges	Gas Total Charges	Cost / Unit Checksum	BTU	
3/26/2014	4/22/2014	125,608	$64,589	$16,593	$81,182	$0.65	2,111,212,000	
4/23/2014	5/23/2014	32,117	$20,730	$3,806	$24,537	$0.76	2,151,623,000	
5/24/2014	6/25/2014	14,687	$9,816	$9,206	$19,022	$1.30	6,267,399,000	
6/26/2014	7/25/2014	5,394	$5,227	$3,381	$8,608	$1.60	3,334,817,000	
7/26/2014	8/23/2014	11,620	$8,302	$7,284	$15,586	$1.34	2,604,414,000	
8/24/2014	9/22/2014	8,528	$6,775	$5,346	$12,120	$1.42	602,737,000	
9/23/2014	10/21/2014	15,531	$9,850	$9,735	$19,585	$1.26	1,468,708,000	
10/22/2014	11/20/2014	21,848	$12,583	$13,764	$26,348	$1.21	539,396,000	
11/21/2014	12/23/2014	31,048	$16,802	$19,462	$36,264	$1.17	1,162,024,000	
12/24/2014	1/22/2015	33,304	$17,837	$20,876	$38,713	$1.16	852,797,000	
1/23/2015	2/26/2015	47,038	$24,135	$29,484	$53,619	$1.14	1,553,095,000	
2/27/2015	3/24/2015	24,743	$13,911	$13,886	$27,797	$1.12	2,184,832,000	
		371,466	$210,559	$152,823	$363,381	$0.98	24,833,054,000	

Justice Complex						
Domestic Water kGal						
Provider:	United Water		Account #	04404498900000	Meter #	
Billing Period Start Date	**Actual Reading**	**Domestic Water kGal**	**$**	**Cost / Unit Checksum**	**BTU**	
6/1/2013	12/31/2013	12238.000	$86,004.94	$7.03	0	
1/1/2014	12/31/2014	20012.000	$140,914.02	$7.04	0	
1/1/2015	2/28/2015	2890.000	$20,469.17	$7.08	0	
3/1/2015				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
		35,140	$247,388	$7.04	0	

P.E.E.R. Building / Parking Garage

P.E.E.R. Building/Parking Garage	**Electric Meter #1**								
	Provider:	JCP&L			100016670539		Meter #	G28073819	
	Commodity:						Meter #		
Month / Year	**Billing Period Start Date**	**Actual Reading**	**Usage kWh**	**Demand kW**	**Electric Total Charges**	**Cost / kWh Checksum**	**Days**	**Load Factor**	**BTU**
May-14	4/1/2014	5/1/2014	168,960	293	$19,175	$0.113	31	78%	576,491,520
Jun-14	5/2/2014	6/1/2014	158,400	292	$18,225	$0.115	31	73%	540,460,800
Jul-14	6/2/2014	7/1/2014	183,040	317	$20,917	$0.114	30	80%	624,532,480
Aug-14	7/2/2014	8/1/2014	107,840	319	$13,243	$0.123	31	45%	367,950,080
Sep-14	8/2/2014	9/1/2014	157,760	296	$18,241	$0.116	31	72%	538,277,120
Oct-14	9/2/2014	10/1/2014	143,360	271	$16,504	$0.115	30	73%	489,144,320
Nov-14	10/2/2014	11/1/2014	123,520	271	$14,432	$0.117	31	61%	421,450,240
Dec-14	11/2/2014	12/1/2014	123,840	289	$14,576	$0.118	30	60%	422,542,080
Jan-15	12/2/2014	1/1/2015	127,680	221	$14,535	$0.114	31	78%	435,644,160
Feb-15	1/2/2015	2/1/2015	138,240	251	$15,859	$0.115	31	74%	471,674,880
Mar-15	2/2/2015	3/1/2015	166,080	262	$18,907	$0.114	28	94%	566,664,960
Apr-15	3/2/2015	4/1/2015	68,160	266	$8,724	$0.128	31	34%	232,561,920
Total			1,666,880	319	$193,337	$0.116	366	59%	5,687,394,560

P.E.E.R. Building/Parking Garage							
Natural Gas Meter #1							
Provider:	NJNG		Account #	194510020018		Meter #	114113
Commodity:			Account #			Meter #	
Billing Period Start Date	**Actual Reading**	**Therms**	**Gas Delivery Charges**	**Gas Commodity Charges**	**Gas Total Charges**	**Cost / Unit Checksum**	**BTU**
3/25/2014	4/22/2014	2,666	$1,727	$1,708	$3,435	$1.29	580,645,000
4/23/2014	5/28/2014	1,933	$1,448	$1,215	$2,662	$1.38	642,184,000
5/29/2014	6/25/2014	1,753	$1,277	$1,099	$2,375	$1.35	467,697,000
6/26/2014	7/25/2014	1,918	$1,358	$1,202	$2,560	$1.33	494,207,000
7/26/2014	8/23/2014	1,889	$1,344	$1,184	$2,527	$1.34	266,587,000
8/24/2014	9/19/2014	1,823	$1,311	$1,143	$2,454	$1.35	193,318,000
9/20/2014	10/21/2014	2,753	$1,702	$1,725	$3,428	$1.25	175,314,000
10/22/2014	11/20/2014	3,981	$2,237	$2,508	$4,745	$1.19	191,816,000
11/21/2014	12/23/2014	5,625	$2,991	$3,526	$6,517	$1.16	188,873,000
12/24/2014	1/22/2015	5,827	$3,083	$3,652	$6,735	$1.16	182,347,000
1/23/2015	2/26/2015	7,150	$3,690	$4,482	$8,171	$1.14	275,266,000
2/27/2015	3/24/2015	4,520	$2,484	$2,536	$5,020	$1.11	398,095,000
		41,837	$24,650	$25,981	$50,631	$1.21	4,056,349,000

P.E.E.R. Building/Parking Garage						
Domestic Water kGal						
Provider:	United Water		Account #	04405960010000	Meter #	
Billing Period Start Date	**Actual Reading**	**Domestic Water kGal**	**$**	**Cost / Unit Checksum**	**BTU**	
6/1/2013	12/31/2013	224.000	$2,138.51	$9.55	0	
1/1/2014	12/31/2014	384.500	$4,119.32	$10.71	0	
1/1/2015	2/28/2015	73.500	$825.39	$11.23	0	
3/1/2015				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
1/1/1900				#DIV/0!	0	
		682	$7,083	$10.39	0	

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ENERGY SAVINGS UTILITY RATES

DCO Energy used the following rates to calculate the energy savings:

CALCULATED UTILITY RATES			
Electric Delivery	kWh	$	0.03
Electric Commodity	kWh	$	0.09
Electric Demand	kW	$	7.15
Electric Blended	kWh	$	0.12
Natural Gas Delivery	Therms	$	0.79
Natural Gas Commodity	Therms	$	0.26
Natural Gas Blended	Therms	$	1.05

ENERGY SAVINGS PLAN

SECTION 3 – ENERGY CONSERVATION MEASURES

ECM Breakdown by Building

	ENERGY CONSERVATION MEASURES	Court House	Administration Building	New Jail	Prosecutor's Office	Justice Complex	P.E.E.R. Building/Parking Garage
1	Lighting Replacement (LED)	✔	✔	✔	✔	✔	✔
2	Energy Management System	✔	✔	✔	✔	✔	✔
3	Boiler Replacement	✔		✔	✔	✔	✔
4	Chiller Replacement	✔				✔	
5	Air Handling Unit Replacement	✔	✔			✔	
6	Roof Top Unit Replacement				✔		
7	Cooling Tower Replacement					✔	
8	Cooling Tower VFD	✔					
9	DX To CHW Conversion						✔
10	FCU Fan Speed Controller	✔	✔				
11	Domestic Hot Water Heater Upgrade	✔	✔		✔		✔
12	Combined Heat and Power					✔	
13	Commissioning	✔	✔	✔	✔	✔	✔

ECM Breakdown by Building by Cost & Savings

Detailed plans, schematics and specifications for Ocean County were not available to deliver a cost estimate for each ECM. The budgetary costs carried in the project are based on good faith estimates, contractor supplied budgets based on general scope of work and a database of actual installed costs for various ECMs.

	Ocean County		Include in Project ?	Installed Cost	Annual Electric Cost Savings	Annual Gas Cost Savings	Annual Energy Cost Savings	Annual O&M Cost Savings	Total Annual Cost Savings
	Energy Conservation Measures (ECM)		"Y or N"	$	$	$	$	$	$
1	Court House	Lighting Replacement (LED)	Y	$169,515	$ 20,520	$0	$20,520	$4,203	$24,723
2	Court House	Energy Management System	Y	$623,915	$7,076	$10,637	$17,713	$0	$17,713
3	Court House	Boiler Replacement	Y	$177,568	$0	$1,520	$1,520	$0	$1,520
4	Court House	Chiller Replacement	Y	$333,501	$1,008	$0	$1,008	$0	$1,008
5	Court House	Air Handling Unit Replacement	Y	$241,875	$1,016	$0	$1,016	$0	$1,016
8	Court House	Cooling Tower VFD	Y	$29,150	$2,840	$0	$2,840	$0	$2,840
10	Court House	FCU Fan Speed Controller	Y	$42,323	$4,281	$0	$4,281	$0	$4,281
11	Court House	Domestic Hot Water Heater Upgrade	Y	$24,200	$6,247	($2,040)	$4,207	$0	$4,207
13	Court House	Commissioning	Y	$41,888	$2,235	$351	$2,586	$0	$2,586
1	Administration Building	Lighting Replacement (LED)	Y	$110,924	$15,538	$0	$15,538	$2,750	$18,288
2	Administration Building	Energy Management System	Y	$387,524	$6,552	$6,184	$12,736	$0	$12,736
5	Administration Building	Air Handling Unit Replacement	Y	$359,524	$1,887	$0	$1,887	$0	$1,887
10	Administration Building	FCU Fan Speed Controller	Y	$41,432	$4,191	$0	$4,191	$0	$4,191
11	Administration Building	Domestic Hot Water Heater Upgrade	Y	$16,500	$2,613	($853)	$1,759	$0	$1,759
13	Administration Building	Commissioning	Y	$17,518	$2,000	$323	$2,323	$0	$2,323
1	New Jail	Lighting Replacement (LED)	Y	$313,994	$90,602	$0	$90,602	$15,570	$106,172
2	New Jail	Energy Management System	Y	$345,400	$0	$0	$0	$0	$0
3	New Jail	Boiler Replacement	Y	$466,703	$0	$7,630	$7,630	$0	$7,630
13	New Jail	Commissioning	Y	$64,680	$3,000	$609	$3,609	$0	$3,609
1	Prosecutor's Office	Lighting Replacement (LED)	Y	$72,909	$9,544	$0	$9,544	$1,808	$11,352
2	Prosecutor's Office	Energy Management System	Y	$196,965	$2,359	$1,855	$4,214	$0	$4,214
3	Prosecutor's Office	Boiler Replacement	Y	$280,379	$0	$3,041	$3,041	$0	$3,041
6	Prosecutor's Office	Roof Top Unit Replacement	Y	$156,295	$3,157	$0	$3,157	$0	$3,157
11	Prosecutor's Office	Domestic Hot Water Heater Upgrade	Y	$13,200	$0	$75	$75	$0	$75
13	Prosecutor's Office	Commissioning	Y	$12,399	$424	$118	$543	$0	$543
1	Justice Complex	Lighting Replacement (LED)	Y	$134,144	$20,952	$0	$20,952	$3,326	$24,277
2	Justice Complex	Energy Management System	Y	$399,818	$9,173	$21,565	$30,737	$0	$30,737
3	Justice Complex	Boiler Replacement	Y	$848,870	$0	$35,343	$35,343	$0	$35,343
4	Justice Complex	Chiller Replacement	Y	$395,001	$835	$0	$835	$0	$835
5	Justice Complex	Air Handling Unit Replacement	Y	$531,575	$14,997	$0	$14,997	$0	$14,997
7	Justice Complex	Cooling Tower Replacement	Y	$191,829	$8,737	$0	$8,737	$0	$8,737
12	Justice Complex	Combined Heat and Power	Y	$4,489,500	$546,328	($289,047)	$257,281	$0	$257,281
13	Justice Complex	Commissioning	Y	$62,986	$4,896	$2,594	$7,489	$0	$7,489
1	P.E.E.R. Building/Parking Garage	Lighting Replacement (LED)	Y	$451,963	$130,888	$0	$130,888	$11,206	$142,094
2	P.E.E.R. Building/Parking Garage	Energy Management System	Y	$191,141	$4,062	$3,198	$7,260	$0	$7,260
3	P.E.E.R. Building/Parking Garage	Boiler Replacement	Y	$204,131	$0	$5,242	$5,242	$0	$5,242
9	P.E.E.R. Building/Parking Garage	DX To CHW Conversion	Y	$574,340	($596)	$0	($596)	$0	($596)
11	P.E.E.R. Building/Parking Garage	Domestic Hot Water Heater Upgrade	Y	$20,350	$3,520	($1,150)	$2,370	$0	$2,370
13	P.E.E.R. Building/Parking Garage	Commissioning	Y	$16,170	$2,000	$441	$2,442	$0	$2,442
	TOTALS			$15,898,758	$932,879	($192,363)	$740,516	$38,862	$779,378

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ECM Breakdown by Building by Energy Savings

	Ocean County		Include in Project ?	Electric Savings	Demand Savings	Gas Savings
	Energy Conservation Measures (ECM)		"Y or N"	kWh	kW	Therms
1	Court House	Lighting Replacement (LED)	Y	167,241	63	0
2	Court House	Energy Management System	Y	58,967	0	10,083
3	Court House	Boiler Replacement	Y	0	0	1,441
4	Court House	Chiller Replacement	Y	8,160	4	0
5	Court House	Air Handling Unit Replacement	Y	8,387	1	0
8	Court House	Cooling Tower VFD	Y	23,665	0	0
10	Court House	FCU Fan Speed Controller	Y	35,673	0	0
11	Court House	Domestic Hot Water Heater Upgrade	Y	52,059	0	(1,934)
13	Court House	Commissioning	Y	18,625	0	333
1	Administration Building	Lighting Replacement (LED)	Y	127,156	39	0
2	Administration Building	Energy Management System	Y	54,599	0	5,862
5	Administration Building	Air Handling Unit Replacement	Y	15,643	1	0
10	Administration Building	FCU Fan Speed Controller	Y	34,922	0	0
11	Administration Building	Domestic Hot Water Heater Upgrade	Y	21,771	0	(809)
13	Administration Building	Commissioning	Y	16,669	0	306
1	New Jail	Lighting Replacement (LED)	Y	748,912	102	0
2	New Jail	Energy Management System	Y	0	0	0
3	New Jail	Boiler Replacement	Y	0	0	7,233
13	New Jail	Commissioning	Y	24,999	0	577
1	Prosecutor's Office	Lighting Replacement (LED)	Y	78,247	22	0
2	Prosecutor's Office	Energy Management System	Y	19,656	0	1,759
3	Prosecutor's Office	Boiler Replacement	Y	0	0	2,882
6	Prosecutor's Office	Roof Top Unit Replacement	Y	26,114	3	0
11	Prosecutor's Office	Domestic Hot Water Heater Upgrade	Y	0	0	71
13	Prosecutor's Office	Commissioning	Y	3,536	0	112
1	Justice Complex	Lighting Replacement (LED)	Y	171,477	52	0
2	Justice Complex	Energy Management System	Y	76,438	0	20,442
3	Justice Complex	Boiler Replacement	Y	0	0	33,503
4	Justice Complex	Chiller Replacement	Y	6,664	5	0
5	Justice Complex	Air Handling Unit Replacement	Y	124,768	3	0
7	Justice Complex	Cooling Tower Replacement	Y	72,809	0	0
12	Justice Complex	Combined Heat and Power	Y	4,516,985	600	(274,000)
13	Justice Complex	Commissioning	Y	40,797	0	2,459
1	P.E.E.R. Building/Parking Garage	Lighting Replacement (LED)	Y	1,082,550	137	0
2	P.E.E.R. Building/Parking Garage	Energy Management System	Y	33,851	0	3,032
3	P.E.E.R. Building/Parking Garage	Boiler Replacement	Y	0	0	4,969
9	P.E.E.R. Building/Parking Garage	DX To CHW Conversion	Y	(4,969)	0	0
11	P.E.E.R. Building/Parking Garage	Domestic Hot Water Heater Upgrade	Y	29,331	0	(1,090)
13	P.E.E.R. Building/Parking Garage	Commissioning	Y	16,669	0	418
	TOTALS			7,712,368	1,034	(182,349)

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ECM Breakdown by Building by Greenhouse Gas Reduction

	Ocean County		Include in Project ?	Reduction of CO_2	Reduction of No_x	Reduction of SO_2	Reduction of Hg
	Energy Conservation Measures (ECM)		"Y or N"	lbs	lbs	lbs	lbs
1	Court House	Lighting Replacement (LED)	Y	254,206	468	1,087	0.006
2	Court House	Energy Management System	Y	207,604	258	383	0.002
3	Court House	Boiler Replacement	Y	16,862	13	0	0.000
4	Court House	Chiller Replacement	Y	12,403	23	53	0.000
5	Court House	Air Handling Unit Replacement	Y	12,749	23	55	0.000
8	Court House	Cooling Tower VFD	Y	35,971	66	154	0.001
10	Court House	FCU Fan Speed Controller	Y	54,222	100	232	0.001
11	Court House	Domestic Hot Water Heater Upgrade	Y	56,499	128	338	0.002
13	Court House	Commissioning	Y	32,204	55	121	0.001
1	Administration Building	Lighting Replacement (LED)	Y	193,278	356	827	0.005
2	Administration Building	Energy Management System	Y	151,580	207	355	0.002
5	Administration Building	Air Handling Unit Replacement	Y	23,777	44	102	0.001
10	Administration Building	FCU Fan Speed Controller	Y	53,081	98	227	0.001
11	Administration Building	Domestic Hot Water Heater Upgrade	Y	23,628	54	142	0.001
13	Administration Building	Commissioning	Y	28,916	49	108	0.001
1	New Jail	Lighting Replacement (LED)	Y	1,138,346	2,097	4,868	0.027
2	New Jail	Energy Management System	Y	0	0	0	0.000
3	New Jail	Boiler Replacement	Y	84,629	67	0	0.000
13	New Jail	Commissioning	Y	44,751	75	162	0.001
1	Prosecutor's Office	Lighting Replacement (LED)	Y	118,935	219	509	0.003
2	Prosecutor's Office	Energy Management System	Y	50,453	71	128	0.001
3	Prosecutor's Office	Boiler Replacement	Y	33,724	27	0	0.000
6	Prosecutor's Office	Roof Top Unit Replacement	Y	39,693	73	170	0.001
11	Prosecutor's Office	Domestic Hot Water Heater Upgrade	Y	831	1	0	0.000
13	Prosecutor's Office	Commissioning	Y	6,689	11	23	0.000
1	Justice Complex	Lighting Replacement (LED)	Y	260,646	480	1,115	0.006
2	Justice Complex	Energy Management System	Y	355,360	402	497	0.003
3	Justice Complex	Boiler Replacement	Y	391,987	308	0	0.000
4	Justice Complex	Chiller Replacement	Y	10,129	19	43	0.000
5	Justice Complex	Air Handling Unit Replacement	Y	189,647	349	811	0.004
7	Justice Complex	Cooling Tower Replacement	Y	110,670	204	473	0.003
12	Justice Complex	Combined Heat and Power	Y	3,660,017	10,127	29,360	0.161
13	Justice Complex	Commissioning	Y	90,777	137	265	0.001
1	P.E.E.R. Building/Parking Garage	Lighting Replacement (LED)	Y	1,645,476	3,031	7,037	0.039
2	P.E.E.R. Building/Parking Garage	Energy Management System	Y	86,926	123	220	0.001
3	P.E.E.R. Building/Parking Garage	Boiler Replacement	Y	58,137	46	0	0.000
9	P.E.E.R. Building/Parking Garage	DX To CHW Conversion	Y	(7,554)	(14)	(32)	(0.000)
11	P.E.E.R. Building/Parking Garage	Domestic Hot Water Heater Upgrade	Y	31,833	72	191	0.001
13	P.E.E.R. Building/Parking Garage	Commissioning	Y	30,231	51	108	0.001
	TOTALS			9,589,314	19,917	50,130	0.275

Demand Response & Project Incentives Analysis

Demand Response

DCO Energy solicited a quotation from a Demand Response provider to determine the potential revenues that Ocean County could realize by signing up with a Demand Response Program. Below is a summary of the quotation. The 3 year value of $38,440 was applied to the project pro forma and is reflected in Form 6 detailed in Section 4 of this ESP.

Program Period	06/01/2017– 05/31/2018	06/01/2018 – 05/31/2019	06/01/2019 – 05/31/2020
Rate Per MW	$38,697.30 $/MW	$76,879.95 $/MW	$36,416.05 $/MW

JCPL Utility Zone

Reduction Amount	2017/18 Capacity Payment	2018/19 Capacity Payment	2019/20 Capacity Payment	Event Energy Payment Per Year	Shut Down Costs	Reserves Payment Per Year	3 Year Payment Totals
300 kilowatts (KW)	$(293)	$14,298	$5,194	$555	TBD	$1,875	$26,490
400 kilowatts (KW)	$2,609	$20,064	$7,925	$740	TBD	$1,875	$38,440
500 kilowatts (kW)	$5,511	$25,830	$10,656	$925	TBD	$1,875	$50,395

Pay For Performance Incentives

The P4P Guidelines require that a building be over the threshold of 200 kW based on the 12 months of utility bills submitted with the application. The Courthouse, Administration Building, Justice Complex, and PEER Building are eligible for Pay for Performance Incentives. However, this requirement eliminates the Prosecutors Office from being eligible for P4P Incentives. The incentive amount carried in the project financial analysis was developed using several of the P4P Guidelines which would apply to the various applicable buildings at Ocean County. The program incentives would pay $0.22 for each kWh saved and $2.50 for each Therm saved.

Direct Install Incentives

Buildings that fall under the 200 kW threshold for P4P Incentives will qualify for the Direct Install Incentives. This program would reimburse the district up to 70% of the installed costs for the following ECMs:

- LED Lighting
- HVAC
- Motors
- VFDs

Incentive Calculations

For P4P Incentives, an estimate of the potential incentives for the project included in the ESP was determined using the kWh and Therms saved on the project for each of the ECMs for each building. For the DI Incentives, a 70% rebate was calculated for the LED Lighting ECM. A potential P4P & DI incentive of $943,025 were calculated. This amount was reduced by 30% and the amount of $628,683 was applied to the project financial analysis (See Section 4).

In addition, the CHP Incentive of $1,100,000 was included in the financial analysis per the CHP Incentive Application and applied according to the payment schedule provided on the application. Please see the following pages for building-by-building details and Appendix H for the CHP Application details.

The project financial analysis shown below and in Section 4 includes the following incentive calculations:

- Year 1 = P4P Incentive #2 ($314,695) + Demand Response Payment ($2,609) + CHP Incentive Year 1 Payment ($330,000)
- Year 2 = P4P Incentive #3 ($314,695) + Demand Response Payment ($20,064) + CHP Incentive Year 1 Payment ($550,000)
- Demand Response Payment ($7,925) + CHP Incentive Year 1 Payment ($220,000)

Energy Rebates/Incentives	
$	647,304
$	866,759
$	227,925

Ocean County			Include in Project ?	Type of Incentive	Incentive Amount
Energy Conservation Measures (ECM)			"Y or N"	Select	$
1	Court House	Lighting Replacement (LED)	Y	P4P	$36,793
2	Court House	Energy Management System	Y	P4P	$38,181
3	Court House	Boiler Replacement	Y	P4P	$3,603
4	Court House	Chiller Replacement	Y	P4P	$1,795
5	Court House	Air Handling Unit Replacement	Y	P4P	$1,845
8	Court House	Cooling Tower VFD	Y	P4P	$5,206
10	Court House	FCU Fan Speed Controller	Y	P4P	$7,848
11	Court House	Domestic Hot Water Heater Upgrade	Y	P4P	$6,617
13	Court House	Commissioning	Y	P4P	$4,930
1	Administration Building	Lighting Replacement (LED)	Y	P4P	$27,974
2	Administration Building	Energy Management System	Y	P4P	$26,668
5	Administration Building	Air Handling Unit Replacement	Y	P4P	$3,441
10	Administration Building	FCU Fan Speed Controller	Y	P4P	$7,683
11	Administration Building	Domestic Hot Water Heater Upgrade	Y	P4P	$2,767
13	Administration Building	Commissioning	Y	P4P	$4,432
1	New Jail	Lighting Replacement (LED)	Y	P4P	$164,761
2	New Jail	Energy Management System	Y	P4P	$0
3	New Jail	Boiler Replacement	Y	P4P	$18,083
13	New Jail	Commissioning	Y	P4P	$6,943
1	Prosecutor's Office	Lighting Replacement (LED)	Y	BPU DI	$51,036
2	Prosecutor's Office	Energy Management System	Y	None	$0
3	Prosecutor's Office	Boiler Replacement	Y	None	$0
6	Prosecutor's Office	Roof Top Unit Replacement	Y	None	$0
11	Prosecutor's Office	Domestic Hot Water Heater Upgrade	Y	None	$0
13	Prosecutor's Office	Commissioning	Y	None	$0
1	Justice Complex	Lighting Replacement (LED)	Y	P4P	$37,725
2	Justice Complex	Energy Management System	Y	P4P	$67,922
3	Justice Complex	Boiler Replacement	Y	P4P	$83,758
4	Justice Complex	Chiller Replacement	Y	P4P	$1,466
5	Justice Complex	Air Handling Unit Replacement	Y	P4P	$27,449
7	Justice Complex	Cooling Tower Replacement	Y	P4P	$16,018
12	Justice Complex	Combined Heat and Power	Y	None	$0
13	Justice Complex	Commissioning	Y	P4P	$15,122
1	P.E.E.R. Building/Parking Garage	Lighting Replacement (LED)	Y	P4P	$238,161
2	P.E.E.R. Building/Parking Garage	Energy Management System	Y	P4P	$15,027
3	P.E.E.R. Building/Parking Garage	Boiler Replacement	Y	P4P	$12,422
9	P.E.E.R. Building/Parking Garage	DX To CHW Conversion	Y	P4P	($1,093)
11	P.E.E.R. Building/Parking Garage	Domestic Hot Water Heater Upgrade	Y	P4P	$3,728
13	P.E.E.R. Building/Parking Garage	Commissioning	Y	P4P	$4,713
TOTALS					$628,683

ECM LISTING	
ECM 1	Lighting Replacement (LED)
ECM 2	Energy Management System
ECM 3	Boiler Replacement
ECM 4	Chiller Replacement
ECM 5	Air Handling Unit Replacement
ECM 6	Rooftop Unit Replacement
ECM 7	Cooling Tower Replacement
ECM 8	Cooling Tower Fan VFD
ECM 9	DX To CHW Conversion
ECM 10	FCU Fan Speed Controller
ECM 11	Domestic Hot Water Heater Upgrade
ECM 12	Combined Heat and Power
ECM 13	Commissioning

ECM 1 – Lighting Replacement (LED)

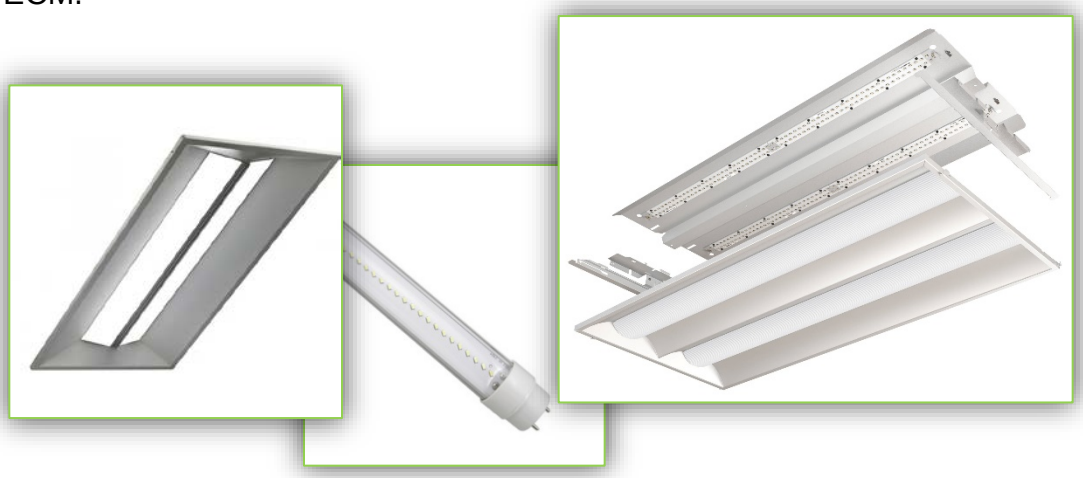
Background & Existing Conditions

Lighting retrofits can greatly reduce energy consumption and lower energy bills, while maintaining lighting levels and quality by upgrading lighting components to more efficient and advanced technologies. Upgrading technologies can also offer employees greater control over lighting, allowing for additional energy savings.

Improvements in lighting technologies have led to increased lifetimes for components that will result in fewer failures and lengthen the time between maintenance activities.

The implementation of a routine maintenance program in addition to your lighting retrofit will greatly simplify your maintenance practices and reduce the operational costs.

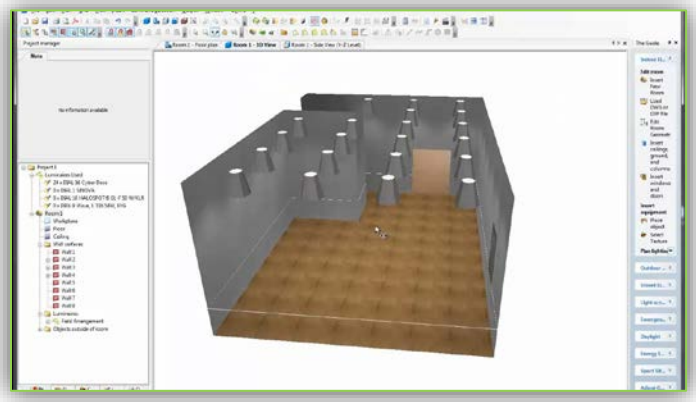
Several new LED exterior lighting lamp and fixture products are now available that were not viable a few years ago. While conventional HID fixtures are controlled only by photocell and timer technologies to turn either on and off, the use of LED fixtures and digital technology allows additional dimming and the use of motion/occupancy-based controls to limit the output of exterior fixtures when sufficient natural lighting is present or for periods when the parking lots and authority grounds are unoccupied. The replacement of existing fixture heads with premium efficiency / LED-based fixtures is the basis of this listed ECM.



Lighting Level Testing and Commissioning

Assuring that the lighting levels of the interior and exterior spaces are a critical component of lighting retrofit project, each space being retrofitted will have lighting levels measured and recorded during the design phase of the project.

The lighting system will be designed to assure that the lighting levels meet code and either meet or exceed the existing levels. Lighting measurements will be taken per IES Standards.



When the retrofit has been completed, the lighting levels in each space will be measured again to assure compliance with the system design. Documentation will be delivered to County of Ocean for approval and record.

Scope of Work

- Retrofit the existing fixtures with new LED Bulbs.
  - Disconnect power at the breaker panel for the existing fixture circuit
  - Remove and dispose of existing bulbs and ballasts in a responsible manner
  - Install new ballast
  - Install new sockets (as necessary)
  - Install new bulbs
  - Test new fixture for operation and performance
  - Test existing space for proper lighting levels
  - Retrofit Components will be UL Listed
  - Bid documents will call for UL Inspection of each retrofitted fixture

Please see Appendix A for lighting line-by-lines for each building.

ECM Calculations

Energy Savings from the installation of new LED Lighting is based on the reduction in Electric Consumption (Watts) from the existing bulbs/fixtures to new LED bulbs/fixtures.

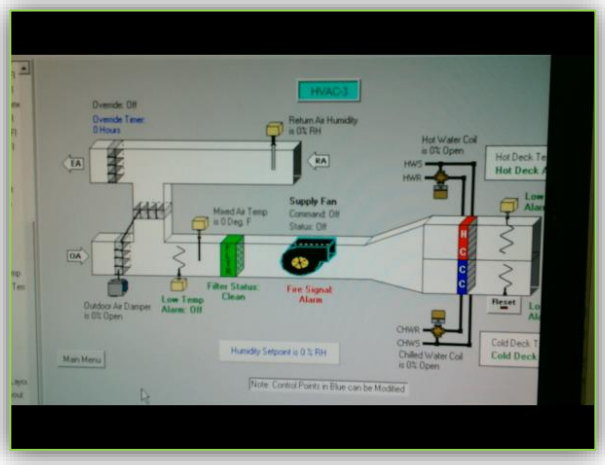
ECM #1 Lighting Replacement (LED)			
BUILDING NAME	**Size (Sq Ft)**	**kWh Saved**	**kW Saved**
Court House	**108,800**	**167,241**	**63**
Administration Building	**45,500**	**127,156**	**39**
New Jail	**168,000**	**748,912**	**102**
Prosecutor's Office	**32,205**	**78,247**	**22**
Justice Complex	**163,600**	**171,477**	**52**
P.E.E.R. Building/Parking Garage	**504,670**	**1,082,550**	**137**

ECM 2 – County Wide Energy Management System

Background & Existing Conditions

Energy Management Systems (EMS) are systems comprised of sensors, operators, processors, and a front-end user interface that controls and monitors electrical and mechanical building systems. Such systems provide automated control and monitoring of the heating, cooling, ventilation, lighting and performance of a building or group of buildings. The energy management system will provide the County of Ocean continuous monitoring & reporting of the Electric and Gas Meters.

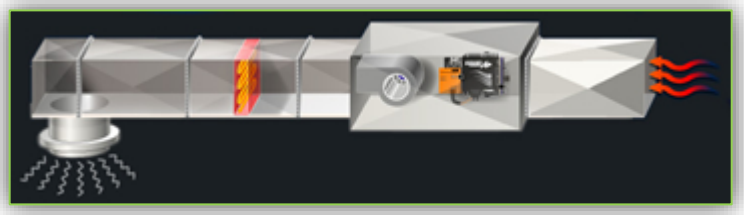
Having building systems monitored from a central location enables the operator to receive alerts and predict future problems or troublesome conditions. The data obtained from these can be used to produce a trend analysis and annual consumption forecasts. Advanced control strategies implemented use these systems such as time scheduling, optimum start and stop, night set-back, demand controlled ventilation, and peak demand limiting. The auditor will be able to use the EMS to diagnose current building system problems as well as tailor specific energy savings strategies that utilize the full capability of the given EMS.



The new County Wide EMS will remove existing pneumatics and replace existing proprietary systems with new DDC Controls.

Control strategies will be designed and programmed into the system to maintain building comfort while operating the building mechanical system in the most efficient manner possible. Strategies include:

- Occupancy Scheduling
- Building Wide Night Set Back
- Morning Warm Up
- Individual Room Temperature Set Point Control
- Supply Air Temperature Reset
- Chilled & Heating Supply Water Temperature Resets
- Economizer Control



Scope of Work – System Wide

- **Web Based, County Wide Energy Management System**
  - Energy Management System shall be accessible via the Internet.
  - User shall have the ability to view the system graphics, change set points, perform overrides, view schedules, change schedules, view alarms, acknowledge alarms, view trend information as well as print, save and e-mail trend information.
  - A Secure Internet Connection to the County Network shall be provided and managed by the County's IT Department.
  - 3-D Graphics Package is provided for navigating the Energy Management System as well as viewing floor plans, system graphics and equipment graphics.
  - New server will be provided to host the new Web Based, County Wide Energy Management System.
  - An Energy Monitoring Dashboard will be provided to display and report Gas & Electrical Consumption for each building detailed in this proposal.
  - The new Web Based, County Wide Energy Management System will reside on the County's Network and access to the system will be controlled by the County.
  - Controls will be Open Protocol and software will be open source. Configuration software and programming tools will be free and the property of Ocean County.
  - The Ocean County Facilities Staff and IT Staff will receive full training on the operation of the system.
  - Portable tablets will be provided for remote and mobile EMS Interface

Scope of Work – Courthouse

- **(1) Existing Condensing Boiler Plant – East Wing**
  - Integration of existing Boiler Control Panel
  - New Open Protocol Controller
  - Variable Volume Pump Control
  - Water & OA Temperature Sensors
  - System Pressure Sensors
  - Supply Water Flow Sensor and System BTU Monitoring
- **(1) Existing Steam Boiler Plant – Historical Wing**
  - Integration of existing Boiler Control Panel
  - New Open Protocol Controller
  - System Pressure Sensors
  - Supply Water Flow Sensor and System BTU Monitoring
- **(1) New Condensing Boiler Plant – West Wing**
  - Integration of new Boiler Control Panel
  - New Open Protocol Controller
  - Variable Volume Pump Control
  - Water & OA Temperature Sensors
  - System Pressure Sensors
  - Supply Water Flow Sensor and System BTU Monitoring
- **(1) Existing Water Cooled Chilled Water System – East Wing**
  - Integration of new Chiller Control Panel
  - Cooling Tower Control
  - New Open Protocol Controller
  - Variable Volume Pump Control
  - Water & OA Temperature Sensors
  - System Pressure Sensors
  - Supply Water Flow Sensor and System BTU Monitoring
- **(1) Existing Air Cooled Chilled Water System – Historical Wing**
  - Integration of new Chiller Control Panel
  - New Open Protocol Controller
  - Variable Volume Pump Control
  - Water & OA Temperature Sensors
  - System Pressure Sensors
  - Supply Water Flow Sensor and System BTU Monitoring
- **(3) New Air Handling Units – East Wing**
  - New Open Protocol AHU Controller
  - Variable Volume Supply and Exhaust Fan Control
  - 2-Way Chilled & Hot Water Control Valves (Installed by Mech Contractor)
  - Damper Actuators
  - OA, RA, & SA Temperature/Humidity Sensors
  - OA Flow Measurement
  - Chilled & Hot Water Return Temperature Sensors

- SA Humidity Sensor
- SA Pressure Sensor

➢ **(12) Existing Air Handling Units**
- New Open Protocol AHU Controller
- Variable Volume Supply and Exhaust Fan Control
- 2-Way Chilled & Hot Water Control Valves (Installed by Mech Contractor)
- Damper Actuators
- OA, RA, & SA Temperature/Humidity Sensors
- OA Flow Measurement
- Chilled & Hot Water Return Temperature Sensors
- SA Humidity Sensor
- SA Pressure Sensor

➢ **(95) Existing Fan Coil Units**
- New Communicating FCU Thermostat
- Fan Speed Controller

➢ **(12) Existing Split Systems**
- New Communicating Thermostat

➢ **(4) Existing Packaged Rooftop Units**
- New Communicating Thermostat

➢ **Energy Monitoring**
- New Electric, Gas, and Water Sub-Meter mounted on the incoming service to the building

Scope of Work – Administration Building

➢ **(1) Existing Condensing Boiler Plant**
- Integration of New Boiler Control Panel
- New Open Protocol Controller
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(1) Existing Water Cooled Chilled Water System**
- Integration of Existing Chiller Control Panel
- Cooling Tower Control
- New Open Protocol Controllers
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(2) New Air Handling Units**
- New Open Protocol AHU Controller
- Variable Volume Supply Fan Control
- New 2-Way Chilled & Hot Water Control Valves (Installed by Mech Contractor)

- New Damper Actuators
- OA, RA, EA & SA Temperature/Humidity Sensors
- Chilled & Hot Water Return Temperature Sensors
- OA Flow Measurement
- SA Humidity & Pressure Sensors

➢ **(27) Existing VAV Boxes**
- New Open Protocol Controller
- New 2-Way Hot Water Coil Control Valve
- Supply Air Temperature Sensor mounted on the discharge side of the Hot Water Coils (As Applies)
- New Hot Water Baseboard Control Valve wired to the associated VAV Controller

➢ **(93) Existing Fan Coil Units**
- New Communicating FCU Thermostat
- Fan Speed Controller

➢ **Energy Monitoring**
- New Electric, Gas, and Water Sub-Meter mounted on the incoming electric service to the building

Scope of Work – New Jail

➢ **(1) New Condensing Boiler Plant – West Wing**
- Integration of New Boiler Control Panel
- New Open Protocol Controller
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(11) Existing Packaged Rooftop Units**
- New Open Protocol AHU Controller
- Variable Volume Supply Fan Control
- New 2-Way Hot Water Control Valves (Installed by Mech Contractor)
- OA, RA, EA & SA Temperature/Humidity Sensors
- Chilled & Hot Water Return Temperature Sensors
- OA Flow Measurement
- SA Humidity & Pressure Sensors

➢ **Energy Monitoring**
- New Electric, Gas, and Water Sub-Meter mounted on the incoming electric service to the building

Scope of Work – Prosecutor's Office

➢ **(1) New Condensing Boiler Plant**
- Integration of New Boiler Control Panel
- New Open Protocol Controller
- Variable Volume Pump Control

- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(3) New Packaged Rooftop Units**
- Integration of New RTU Open Protocol Interface
- System Pressure Sensors

➢ **(62) Existing VAV Boxes**
- New Open Protocol Controller
- New 2-Way Hot Water Coil Control Valve
- Supply Air Temperature Sensor mounted on the discharge side of the Hot Water Coils (As Applies)
- New Hot Water Baseboard Control Valve wired to the associated VAV Controller

➢ **(12) Existing Split Systems**
- New Communicating Thermostat

➢ **Energy Monitoring**
- New Electric, Gas, and Water Sub-Meter mounted on the incoming electric service to the building

Scope of Work – PEER Building

➢ **(1) New Condensing Boiler Plant**
- Integration of New Boiler Control Panel
- New Open Protocol Controller
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(1) New Air Cooled Chilled Water System**
- Integration of New Chiller Control Panel
- New Open Protocol Controller
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(51) Existing VAV Boxes**
- New Open Protocol Controller
- New 2-Way Hot Water Coil Control Valve
- Supply Air Temperature Sensor mounted on the discharge side of the Hot Water Coils (As Applies)
- New Hot Water Baseboard Control Valve wired to the associated VAV Controller

➢ **(4) Existing Air Handling Units**
- New Open Protocol AHU Controller
- Variable Volume Supply and Exhaust Fan Control
- 2-Way Chilled & Hot Water Control Valves (Installed by Mech Contractor)

- Damper Actuators
- OA, RA, & SA Temperature/Humidity Sensors
- OA Flow Measurement
- Chilled & Hot Water Return Temperature Sensors
- SA Humidity & Pressure Sensors

➢ **Energy Monitoring**
- New Electric, Gas, and Water Sub-Meter mounted on the incoming electric service to the building

Scope of Work – Justice Complex

➢ **(1) New Condensing Boiler Plant**
- Integration of New Boiler Control Panel
- New Open Protocol Controller
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(1) Existing Water Cooled Chilled Water System**
- Integration of New Chiller Control Panel
- Cooling Tower Control
- New Open Protocol Controller
- Variable Volume Pump Control
- Water & OA Temperature Sensors
- System Pressure Sensors
- Supply Water Flow Sensor and System BTU Monitoring

➢ **(6) New Air Handling Units**
- New Open Protocol AHU Controller
- Variable Volume Supply and Return Fan Control
- 2-Way Chilled & Hot Water Control Valves (Installed by Mech Contractor)
- Damper Actuators
- OA, RA, & SA Temperature/Humidity Sensors
- OA Flow Measurement
- Chilled & Hot Water Return Temperature Sensors
- SA Humidity & Pressure Sensors

➢ **(107) Existing VAV Boxes**
- New Open Protocol Controller
- New 2-Way Hot Water Coil Control Valve
- Supply Air Temperature Sensor mounted on the discharge side of the Hot Water Coils (As Applies)
- New Hot Water Baseboard Control Valve wired to the associated VAV Controller

➢ **(4) Existing Split Systems**
- New Communicating Thermostat

ECM Calculations

Energy Savings from the EMS is based on the reduction in Electric and Gas Consumption resulting from Occupancy Based Control Sequences. Per BPU Protocols, those formulas are as follows:

Occupancy Controlled Thermostat Savings Calculation

Cooling Energy Savings (kWh) = $(((T_c*(H+5)+S_c*(168-(H+5)))/168)-T_c)*(P_c*Cap_{hp}*12*EFLH_c/EER_{hp})$

Heating Energy Savings (kWh) = $(((T_h*(H+5)+S_h*(168-(H+5)))/168)-T_h)*(P_h*Cap_{hp}*12*EFLH_h/EER_{hp})$

Heating Energy Savings (Therms) = $(T_h-(T_h*(H+5)+S_h*(168-(H+5)))/168)*(P_h*Cap_h*EFLH_h/AFUE_h/100{,}000)$

Th	72
Tc	75
Sh	67
Sc	85
H	56
CAPhp	variable
CAPh	variable
EFLHc	381
EFLHh	900
Ph	3%
Pc	6%
AFUEh	88%
EERhp	8

HVACe=Building Electric Load * 38%

HVACg=Building Gas Load * 82%

Definition of Variables

T_h = Heating Season Facility Temp. (°F)
T_c = Cooling Season Facility Temp. (°F)
S_h = Heating Season Setback Temp. (°F)
S_c = Cooling Season Setup Temp. (°F)
H = Weekly Occupied Hours
Cap_{hp} = Connected load capacity of heat pump/AC (Tons) – Provided on Application.
Cap_h = Connected heating load capacity (Btu/hr) – Provided on Application.
$EFLH_c$ = Equivalent full load cooling hours
$EFLH_h$ = Equivalent full load heating hours
P_h = Heating season percent savings per degree setback
P_c = Cooling season percent savings per degree setup
$AFUE_h$ = Heating equipment efficiency – Provided on Application.
EER_{hp} = Heat pump/AC equipment efficiency – Provided on Application

Based on BPU Protocols, the energy savings for ECM #2 – County Wide Energy Management System are the following:

Energy Management System Energy Savings Calculation				
BUILDING NAME	**CAPhp**	**CAPh**	**Cooling Energy Savings (kWh)**	**Heating Energy Savings (th)**
Court House	270	10,320,000	58,967	10,083
Administration Building	250	6,000,000	54,599	5,862
New Jail	370	4,517,000	N/A	N/A
Prosecutor's Office	90	1,800,000	19,656	1,759
Justice Complex	350	20,922,000	76,438	20,442
P.E.E.R. Building/Parking Garage	155	3,103,000	33,851	3,032

Note:

- The New Jail will have the RTU's and Hot Water System integrated into the EMS. However, since it is occupied 24/7 and there will be no occupancy control programmed into the EMS, no savings are associated with the integration.

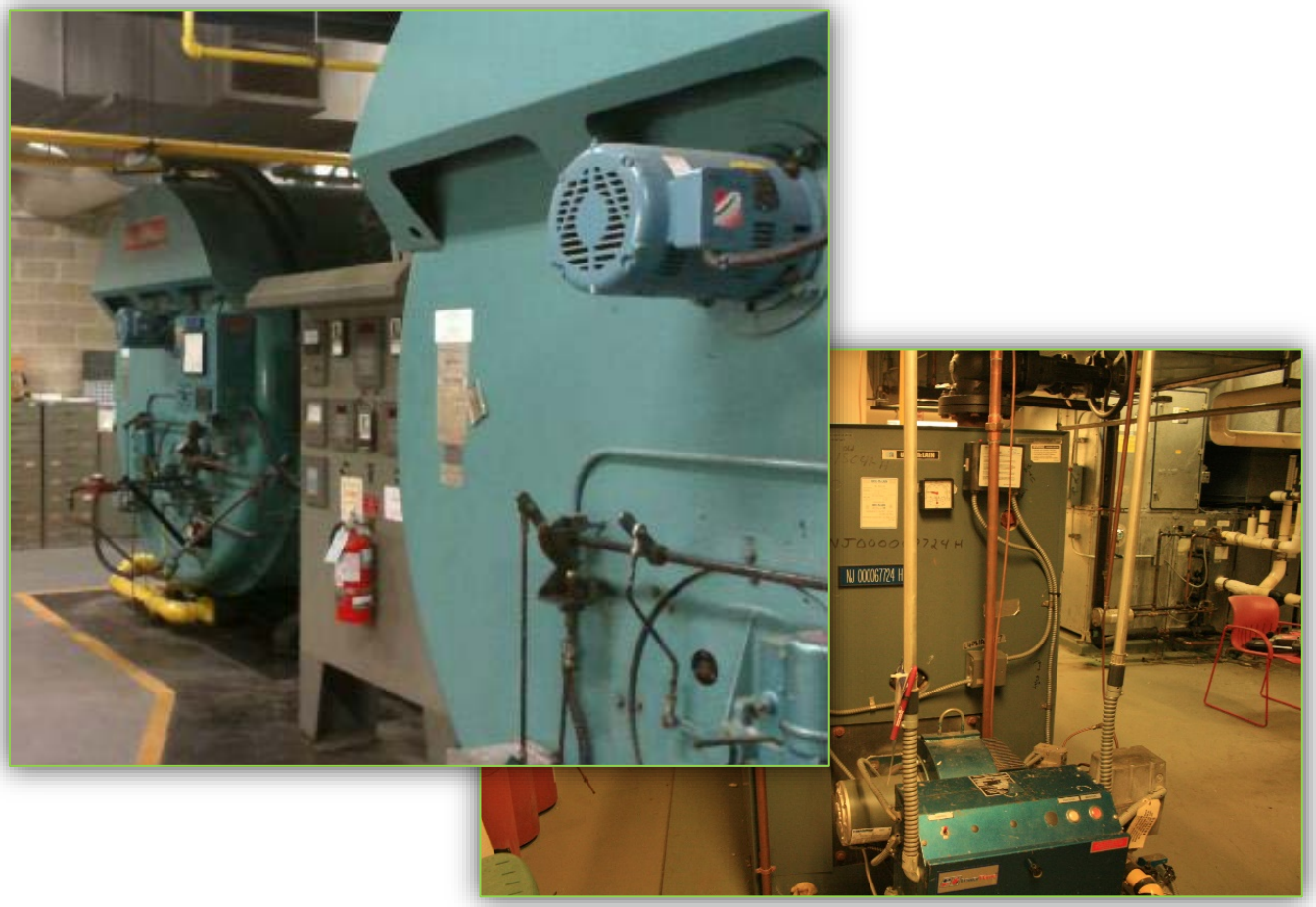
ECM 3 – Boiler Replacement

Background & Existing Conditions

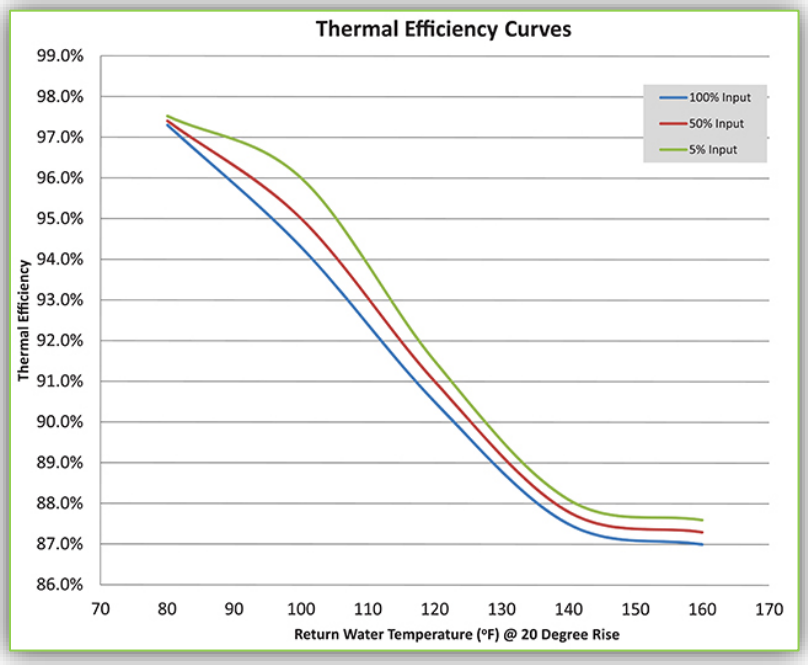
The Prosecutor's Office is served by (6) Hydrotherm Modular Boilers. The PEER Building contains (1) Weil McLain Model 88 Boiler. The Justice Complex is served by (2) Cleaver Brooks model CB200-500 Steam Boilers. The Courthouse West Wing is served by (1) HB Smith Model 2500L Hot Water Boiler and the New Jail is served by (2) HB Smith Cast Iron Sectional Boilers. Each of these existing boilers will be retrofitted with new, high efficiency condensing boilers.

Note:

- The Administration Building as well as the Courthouse East Wing Hot Water Heating System are served by an existing Condensing Boiler Plant and are not included in this ECM.



Older boiler systems have efficiencies in the range of 56%–75%. A condensing boiler hot water heating system can achieve efficiencies as high as 97%, converting nearly all of the fuel to useful heat. A new high-efficiency heating system will reduce natural gas consumption and pollution.



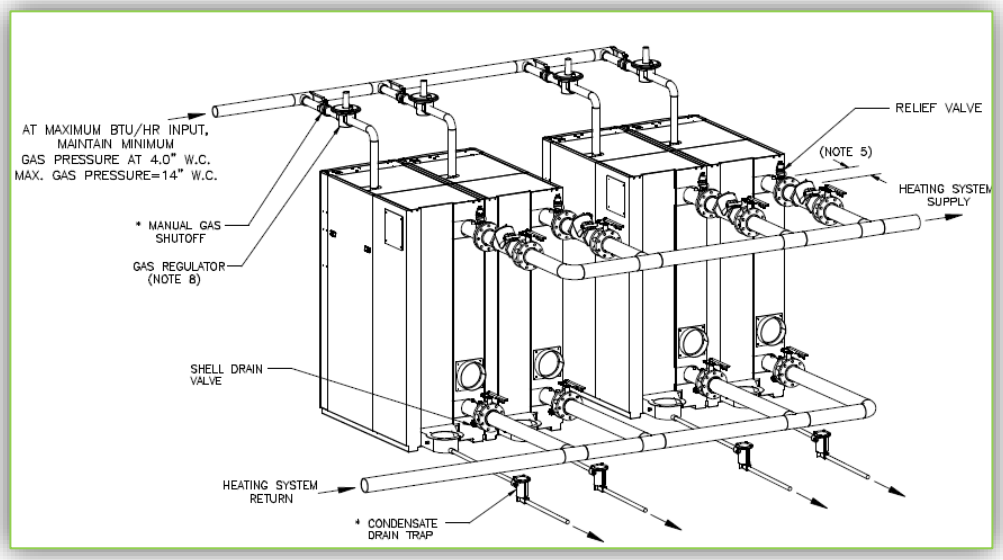
Scope of Work

ECM 3 will replace the existing boilers in the Prosecutor's Office, PEER Building, Courthouse West Wing, Justice Complex, and New Jail with condensing boilers capable of efficiencies upwards of 99%.

The piping arrangement of the boilers will be Variable Primary with a variable frequency drive to modulate the hot water flow throughout the building.

- Demolish Existing Boiler Plant in Prosecutor's Office, PEER Building, Courthouse West Wing, Justice Complex, and New Jail.
  - Disconnect power at the Boiler
  - Disconnect Natural Gas service at the Boiler
  - Disconnect existing Steam Piping
  - Remove existing and responsibly dispose of Steam-To-HW Heat Exchangers
  - Remove existing and responsibly dispose of pumps
  - Remove existing and responsibly dispose of boilers
  - Note:
    - Demolished equipment will become the property of the demolition contractor.

- Furnish and Install new Condensing Boilers
- Furnish and install new concrete housekeeping pads for Boilers
- Install new piping in a Variable/Primary configuration
- Install new pipe, valves, & fittings
- Install insulation on new piping
- Install necessary sensor, wells, and flow meters as required for complete system. Sensors, wells, and flow meters will be provided by the EMS Contractor.
- Install new flue, venting to the side of the building
- Re-use existing louvers and combustion air system and connect to the new boilers
- Install new self-sensing VFD System Pumps
- Reconnect existing hot water piping to the new Boiler Plant
- Installation check, start-up, performance test, & functional testing on the new heating hot water system
- At the Justice Complex, a Heat Exchanger will be installed in place of the existing Steam-To-Hot Water Heat exchanger that currently serves the Domestic Hot Water System. While the heating for the Domestic Hot Water is being provided by the new CHP System, this HX is provided for redundancy.
- Note:
    - Cost of new DDC Controls for the Boiler Plant is carried in ECM #2.



ECM Calculations

Energy Savings from the installation of high efficiency condensing boilers are based on the reduction in Gas Consumption resulting from the increased efficiency of the baseline boiler to the new boilers. Per BPU Protocols, that formula is as follows:

$$Gas\ Savings\ (Therms) = \left[\frac{OF \times HDD_{mod} \times 24 \times \left(\left(CAPY_{B.out} \times AFUE_q\right) - \left(CAPY_{Q.out} \times AFUE_b \times ICF\right)\right)}{\Delta T \times HC_{fuel} \times AFUE_b \times AFUE_q \times ICF}\right]$$

Definition of Variables

OF = Oversize factor of standard heater (OF=0.8)

$CAPY_{B.out}$ = Total output capacity of the baseline heater(s) in Btu/hour

$AFUE_Q$ = Efficiency of qualifying heater(s) (AFUE %)

$CAPY_{Q.out}$ = Total output capacity of the qualifying heater(s) in Btu/hour

$AFUE_B$ = Efficiency of baseline heaters (AFUE %)

ICF = Infrared Compensation Factor (ICF = 0.8 for IR Heaters)

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

HC_{fuel} = Conversion from Btu to Therms of gas (100,000 Btu/Therm)

Component	Type	Value	Source
$AFUE_q$	Variable		Application
$AFUE_b$	Fixed	Furnaces: 78% Boilers: 80% Infrared: 78%	EPACT Standard for furnaces and boilers
$CAPY_{in}$	Variable		Application
ΔT	Variable	See Table Below	1
HDD_{mod}	Fixed	See Table Below	1

Adjusted Heating Degree Days by Building Type

Building Type	Heating Energy Density (kBtu/sf)	Degree Day Adjustment Factor	Atlantic City (HDD)	Newark (HDD)	Philadelphia (HDD)	Monticello (HDD)
Education	29.5	0.55	2792	2783	2655	3886
Food Sales	35.6	0.66	3369	3359	3204	4689
Food Service	39.0	0.73	3691	3680	3510	5137
Health Care	53.6	1.00	5073	5057	4824	7060
Lodging	15.0	0.28	1420	1415	1350	1976
Retail	29.3	0.55	2773	2764	2637	3859
Office	28.1	0.52	2660	2651	2529	3701
Public Assembly	33.8	0.63	3199	3189	3042	4452
Public Order/Safety	24.1	0.45	2281	2274	2169	3174
Religious Worship	29.1	0.54	2754	2745	2619	3833
Service	47.8	0.89	4524	4510	4302	6296
Warehouse/Storage	20.2	0.38	1912	1906	1818	2661

Heating Degree Days and Outdoor Design Temperature by Zone

Weather Station	HDD	Outdoor Design Temperature (F)
Atlantic City	5073	13
Newark	5057	14
Philadelphia, PA	4824	15
Monticello, NY	7060	8

Based on BPU Protocols, the energy savings for ECM #3 – Boiler Replacement are the following:

ECM-3 Boiler Replacement ECM Savings

BUILDING NAME	Size (Sq Ft)	Qty	Boiler Manufac.	Baseline Plant Rated Input MBH (CAPYb.out)	Estimated Existing Efficiency (AFUEb)
Court House	108,800	1	HB Smith	900	80%
New Jail	168,000	2	Weil McLain	4,517	80%
Prosecutor's Office	32,205	6	HydroTherm	1,800	80%
Justice Complex	163,600	2	Cleaver Brooks	20,922	80%
P.E.E.R. Building/Parking Garage	504,670	1	Weil McLain	3,103	80%

ECM-3 Boiler Replacement ECM Savings

BUILDING NAME	Qualifying Boiler Plant Capacity (CAPYq.out)	Qualifying Boiler Efficiency (AFUEq)	Adjusted Heating Degree Days (HDDmod)	Delta T (HDD Base Temp - Design Temp)	Conversion of BTU to therms (HCfuel)	Infrared Compensation Factor (ICF)	Calculated Annual Fuel Savings
Court House	900	92%	2,660	52	100,000	1.00	1,441
New Jail	4,517	92%	2,660	52	100,000	1.00	7,233
Prosecutor's Office	1,800	92%	2,660	52	100,000	1.00	2,882
Justice Complex	20,922	92%	2,660	52	100,000	1.00	33,503
P.E.E.R. Building/Parking Garage	3,103	92%	2,660	52	100,000	1.00	4,969

ECM 4 – Chiller Replacement

Background & Existing Conditions

The existing chiller in the basement of the Courthouse East Wing serves the HVAC system of the entire wing and is a 200 Ton Water Cooled Carrier Chiller using R11 Refrigerant. The chiller is 30 years old and beyond the ASHRAE service life of 25 years. The rated kW/Ton of the machine is approximately 0.715.

The existing chiller in the basement of the Justice Complex serves (6) air handling units and is a 350 Ton Water Cooled Carrier Chiller using R11 Refrigerant. The chiller is 35 years old and beyond the ASHRAE service life of 25 years. The rated kW/Ton of the machine is approximately 0.715.

A chiller is one of the most intensive energy users in any facility. Technology has made leaps and bounds in the past several years in making these machines more efficient. Chiller efficiency is rated in how much electric energy is used to produce an amount of cooling. This is expressed in kilo-watts per ton of cooling (kW/Ton). An older machine may be as high as 0.9 kW/Ton, where a new water cooled machine may be as low as 0.6 kW/Ton. A new machine uses less electrical power to produce the same amount of cooling.

Scope of Work

- Demolish Existing Water Cooled Centrifugal Chillers in the Justice Complex and the Courthouse East Wing
  - Disconnect power at the Chiller
  - Disconnect Natural Gas service at the Boiler
  - Disconnect existing Water Piping
  - Reclaim and responsibly dispose of existing refrigerant
  - Remove existing and responsibly dispose of Chillers
  - Remove existing and responsibly dispose of CHW Pumps
  - Note:
    - Demolished equipment will become the property of the demolition contractor.

- Furnish and Install new Water Cooled Chiller
  - New chillers will be resized to provide the proper amount of cooling for the building
  - New chillers will need to be delivered in a “Knocked Down” state and assembled in place in the East Wing Basement and the Justice Complex
  - Furnish and install new concrete housekeeping pads for Chiller (as required)
  - Furnish and install new chiller vibration isolation pads
  - Charge new chiller with refrigerant
  - Install new pipe, valves, & fittings
  - Install insulation on new piping
  - Install necessary sensor, wells, and flow meters as required for complete system. Sensors, wells, and flow meters will be provided by the EMS Contractor.
  - Install new self-sensing VFD System Pumps
  - Reconnect existing chilled and condenser water piping to the new Chiller
  - Installation check, start-up, performance test, & functional testing on the water cooled chiller system
- Note:
  - Cost of new DDC Controls for the Chiller Plant is carried in ECM #2.

ECM Calculations

Energy Savings from the installation of new higher efficiency chillers are based on the reduction in Electrical Consumption and Electrical Demand resulting from the increased efficiency of the baseline Chiller to the new Chiller. Per BPU Protocols, that formula is as follows:

Electric Chillers

The measurement of energy and demand savings for C&I Chillers program is based on algorithms with key variables (i.e., kW/ton, Coincidence Factor, Equivalent Full Load Hours) measured through existing end-use metering of a sample of facilities.

Algorithms

For IPLV:

Demand Savings = Tons PDC X $(IPLV_b - IPLV_q)$

Energy Savings = Tons X EFLH X $(IPLV_b - IPLV_q)$

For FLV:

Demand Savings = Tons PDC X $(FLV_b - FLV_q)$

Energy Savings = Tons X EFLH X $(FLV_b - FLV_q)$

Definition of Variables

Tons = Rated equipment cooling capacity

EFLH = Equivalent Full Load Hours – This represents a measure of chiller use by season determined by measured kWh during the period divided by kW at design conditions from JCP&L measurement data.

PDC = Peak Duty Cycle: fraction of time the compressor runs during peak hours

$IPLV_b$ = Integrated Part Load Value of baseline equipment, kW/Ton. The efficiency of the chiller under partial-load conditions.

$IPLV_q$ = Integrated Part Load Value of qualifying equipment, kW/Ton. The efficiency of the chiller under partial-load conditions.

FLV_b = Full Load Value of baseline equipment, kW/Ton. The efficiency of the chiller under full-load conditions.

FLV_q = Full Load Value of qualifying equipment, kW/Ton. The efficiency of the chiller under full-load conditions.

Component	Type	Situation	Value	Source
$IPLV_b$ (kW/ton)	Fixed	Air Cooled with Condenser (All)	1.153	ASHRAE 90.1-2007
		Air Cooled w/o Condenser (All)	1.019	
		Water Cooled, reciprocating	0.696	ASHRAE 90.1-2007
		Water Cooled (<150 tons)	0.676	ASHRAE 90.1-2007
		Water Cooled (151 to 300 tons)	0.628	
		Water Cooled, screw/scroll (>300 tons)	0.572	ASHRAE 90.1-2007
		Water Cooled, centrifugal (<150 tons)	0.670	ASHRAE 90.1-2007
		Water Cooled, centrifugal (>=150 tons to 300 tons)	0.596	ASHRAE 90.1-2007
		Water Cooled, centrifugal >300 tons)	0.549	ASHRAE 90.1-2007
FLV_b (kW/ton)	Fixed	Air Cooled with Condenser (All)	1.256	ASHRAE 90.1-2007
		Air Cooled w/o Condenser (All)	1.135	ASHRAE 90.1-2007
		Water Cooled, reciprocating	0.837	ASHRAE 90.1-2007
		Water Cooled (<150 tons)	0.790	ASHRAE 90.1-2007
		Water Cooled (151 to 300 tons)	0.718	ASHRAE 90.1-2007
		Water Cooled, screw/scroll (>300 tons)	0.639	ASHRAE 90.1-2007
		Water Cooled, centrifugal (<150 tons)	0.7034	ASHRAE 90.1-2007
		Water Cooled, centrifugal (>=150 tons to 300 tons)	0.634	ASHRAE 90.1-2007
		Water Cooled, centrifugal >300 tons)	0.577	ASHRAE 90.1-2007
Tons	Variable	All	Varies	From Application
$IPLV_q$ (kW/ton)	Variable	All	Varies	From Application (per AHRI Std. 550/590)
PDC	Fixed	All	67%	Engineering Estimate
EFLH	Fixed	All	1,360	California DEER

Based on BPU Protocols, the energy savings for ECM #4 – Chiller Replacement are the following:

ECM #4 - Chiller Replacement ECM Savings Worksheet									
BUILDING NAME	Size (Sq Ft)	Qty	Tons	EFLH	FLVb	FLVq	PDC	Demand Savings (kW)	Energy Savings (kWh)
Court House	108,800	1	200	1,360	0.634	0.604	67%	4.00	8,160
Justice Complex	163,600	1	350	1,360	0.577	0.563	67%	4.90	6,664

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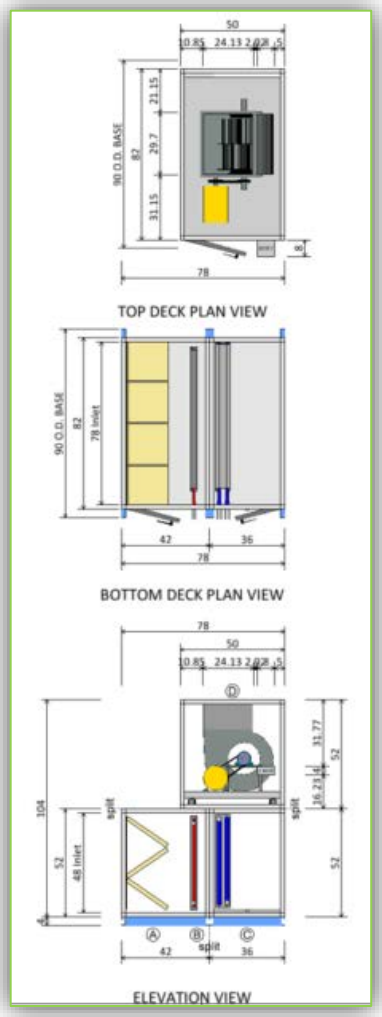
ECM 5 – Air Handling Unit Replacement

Background & Existing Conditions

There are (2) Air Handling Units in the Administration Building, (6) AHUs in the Justice Complex and (3) AHUs in the Courthouse that will benefit from the installation of new units. Existing units are past their useful life and utilize older technology such as inlet guide vanes, pneumatic controls, and multi-zone control.

Scope of Work

- Demolish existing (11) Air Handling Units
  - Disconnect power
  - Disconnect existing hot water piping
  - Disconnect existing chilled water piping
  - Disconnect existing supply and outside air ductwork
  - Remove existing Exhaust Fans and associated ductwork
  - Remove existing control panels and control accessories
- Furnish and Install (11) new Air Handling Units to replace the existing units. In general, new Air Handling Units to have the following:
  - Mixing Box
  - Filter
  - Hot Water Heating Coil
  - Chilled Water Cooling Coil
  - Return/Exhaust Fan w/VFD
  - Supply Fan w/VFD
- Reconnect existing supply ductwork to the new units
- Connect existing return and exhaust ductwork to new units
- Reconnect existing hot water piping and chilled water to the new units
- Note:
  - Cost of new DDC Controls for each AHU is carried in ECM #2



ECM Calculations

Energy Savings from Air Handling Unit Replacement are based on the reduction in Electric Consumption resulting from premium efficiency motors and the addition of Variable Frequency Drives on Return/Supply Fans. Per BPU Protocols, those formulas are as follows:

Motors

For premium efficiency motors 1-200 HP.

Algorithms

From application form calculate ΔkW where:

$$\Delta kW = 0.746 * HP * IF_{VFD} * (1/\eta_{base} - 1/\eta_{prem})$$

Demand Savings = (ΔkW) X CF

Energy Savings = (ΔkW)*HRS * LF

Definition of Variables

ΔkW = kW Savings at full load

HP = Rated horsepower of qualifying motor, from nameplate/manufacturer specs.

LF = Load Factor, percent of full load at typical operating condition

IF_{VFD} = VFD Interaction Factor, 1.0 without VFD, 0.9 with VFD

η_{base} = Efficiency of the baseline motor

η_{prem} = Efficiency of the energy-efficient motor

HRS = Annual operating hours

CF = Coincidence Factor

Motors

Component	Type	Value	Source
HP	Variable	Nameplate/Manufacturer Spec. Sheet	Application
LF	Fixed	0.75	1
hp_{base}	Fixed	EPACT Baseline Efficiency Table	EPACT Directory
hp_{prem}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
IF_{VFD}	Fixed	1.0 or 0.9	3
Efficiency - η_{ee}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
CF	Fixed	0.74	1
HRS	Fixed	Annual Operating Hours Table	1

EPAct Baseline Motor Efficiency Table

Motor Horsepower	1200 RPM (6 pole)		1800 RPM (4 pole)		3600 RPM (2 pole)	
	ODP	TEFC	ODP	TEFC	ODP	TEFC
1	0.8	0.8	0.825	0.825	na	0.755
1.5	0.84	0.855	0.84	0.84	0.825	0.825
2	0.855	0.865	0.84	0.84	0.84	0.84
3	0.865	0.875	0.865	0.875	0.84	0.855
5	0.875	0.875	0.875	0.875	0.855	0.875
7.5	0.885	0.895	0.885	0.895	0.875	0.885
10	0.9002	0.895	0.895	0.895	0.885	0.895
15	0.902	0.902	0.91	0.91	0.895	0.902
20	0.91	0.902	0.91	0.91	0.902	0.902
25	0.917	0.917	0.917	0.924	0.91	0.91
30	0.924	0.917	0.924	0.924	0.91	0.91
40	0.93	0.93	0.93	0.93	0.917	0.917
50	0.93	0.93	0.93	0.93	0.924	0.924
60	0.936	0.936	0.936	0.936	0.93	0.93
75	0.936	0.936	0.941	0.941	0.93	0.93
100	0.941	0.941	0.941	0.945	0.93	0.936
125	0.941	0.941	0.945	0.945	0.936	0.945
150	0.945	0.95	0.95	0.95	0.936	0.945
200	0.945	0.95	0.95	0.95	0.945	0.95

*Note: For the Direct Install Program, different baseline efficiency values are used.

NEMA Premium Motor Efficiency Table

Motor Horsepower	1200 RPM (6 pole)		1800 RPM (4 pole)		3600 RPM (2 pole)	
	ODP	TEFC	ODP	TEFC	ODP	TEFC
1	0.825	0.825	0.855	0.855	0.77	0.77
1.5	0.865	0.875	0.865	0.865	0.84	0.84
2	0.875	0.885	0.865	0.865	0.855	0.855
3	0.885	0.895	0.895	0.895	0.855	0.865
5	0.895	0.895	0.895	0.895	0.865	0.885
7.5	0.902	0.91	0.91	0.917	0.885	0.895
10	0.917	0.91	0.917	0.917	0.895	0.902
15	0.917	0.917	0.93	0.924	0.902	0.91
20	0.924	0.917	0.93	0.93	0.91	0.91
25	0.93	0.93	0.936	0.936	0.917	0.917
30	0.936	0.93	0.941	0.936	0.917	0.917
40	0.941	0.941	0.941	0.941	0.924	0.924
50	0.941	0.941	0.945	0.945	0.93	0.93
60	0.945	0.945	0.95	0.95	0.936	0.936
75	0.945	0.945	0.95	0.954	0.936	0.936
100	0.95	0.95	0.954	0.954	0.936	0.941
100	0.95	0.95	0.954	0.954	0.941	0.95
150	0.954	0.958	0.958	0.958	0.941	0.95
200	0.954	0.958	0.958	0.962	0.95	0.954

Annual Operating Hours Table

Motor Horsepower	Operating Hours, HRS
1 to 5 HP	2,745
6 to 20 HP	3,391
21 to 50 HP	4,067
51 to 100 HP	5,329
101 to 200 HP	5,200

Variable Frequency Drives

The measurement of energy and demand savings for C/I Variable Frequency Drive for VFD applications is for HVAC fans, water pumps, boiler feed water pumps and draft fans only. VFD applications for other than this use should follow the custom path.

Algorithms

Energy Savings (kWh) = $0.746*HP*HRS*(ESF/\eta_{motor})$

Demand Savings (kW) = $0.746*HP*(DSF/\eta_{motor})$

Definitions of Variables

HP = nameplate motor horsepower or manufacturer spec. sheet per application

η_{motor} = Motor efficiency at the peak load. Motor efficiency varies with load. At low loads relative to the rated hp (usually below 50%) efficiency often drops dramatically.

ESF = Energy Savings Factor. The energy savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions.

DSF = Demand Savings Factor. The demand savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions

HRS = annual operating hours

Variable Frequency Drives

Component	Type	Value	Source
Motor HP	Variable	Nameplate/Manufacturer Spec. Sheet	Application
η_{motor}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
ESF	Variable	See Table Below	Connecticut Ligh and Power
DSF	Variable	See Table Below	Connecticut Ligh and Power
HRS	Variable	>2,000	Application

VFD Savings Factors

Component	Energy Savings Factor, ESF	Demand Savings Factor, DSF
Airfoil/Backward Inclined Fans	0.475	0.448
Forward Curved Fans	0.240	0.216
Chilled Water Pumps	0.580	0.201
Cooling Tower Fans	0.580	0.000

Based on BPU Protocols, the energy savings for ECM #5 – Air Handling Unit Replacement are the following:

Note:

- Demand Savings Factor and Energy Savings Factor used in the calculations reflect those for Forward Curved Fans.

Motor Efficiency Savings

ECM #5 - Air Handling Unit Replacement											
Building	Unit Tag/Fan	Fan Motor HP	Existing Motor Efficiency (Nbase)	Replacement Motor Efficiency (Nprem)	LF	CF	IFvfd	HRS	ΔkW	Demand Savings	Energy Savings(kWh)
Administration	AH-1 SF	10.0	89.5%	91.7%	0.75	0.74	1.0	3,391	0.2000	0.15	508.58
	AH-1 RF	3.0	86.5%	89.5%	0.75	0.74	1.0	2,745	0.0867	0.06	178.54
	AH-2 SF	7.5	88.5%	91.0%	0.75	0.74	1.0	3,391	0.1737	0.13	441.72
	AH-2 RF	2.0	84.0%	86.5%	0.75	0.74	1.0	2,745	0.0513	0.04	105.69
Courthouse	HVAC-1	7.5	88.5%	91.0%	0.75	0.74	1.0	3,391	0.1737	0.13	441.72
	HVAC-2	5.0	87.5%	89.5%	0.75	0.74	1.0	2,745	0.0953	0.07	196.12
Justice Complex	AHU-1 SF	30.0	92.4%	94.1%	0.75	0.74	1.0	4,067	0.4376	0.32	1,334.70
	AHU-1 RF	15.0	91.0%	93.0%	0.75	0.74	1.0	3,391	0.2644	0.20	672.55
	AHU-2 SF	20.0	91.0%	93.0%	0.75	0.74	1.0	3,391	0.3526	0.26	896.73
	AHU-2 RF	10.0	89.5%	91.7%	0.75	0.74	1.0	3,391	0.2000	0.15	508.58
	AHU-3 SF	30.0	92.4%	94.1%	0.75	0.74	1.0	4,067	0.4376	0.32	1,334.70
	AHU-3 RF	15.0	91.0%	93.0%	0.75	0.74	1.0	3,391	0.2644	0.20	672.55
	AHU-4 SF	20.0	91.0%	93.0%	0.75	0.74	1.0	3,391	0.3526	0.26	896.73
	AHU-4 RF	10.0	89.5%	91.7%	0.75	0.74	1.0	3,391	0.2000	0.15	508.58
	AHU-6 SF	10.0	89.5%	91.7%	0.75	0.74	1.0	3,391	0.2000	0.15	508.58
	AHU-7 SF	7.5	88.5%	91.0%	0.75	0.74	1.0	3,391	0.1737	0.13	441.72

VFD Savings

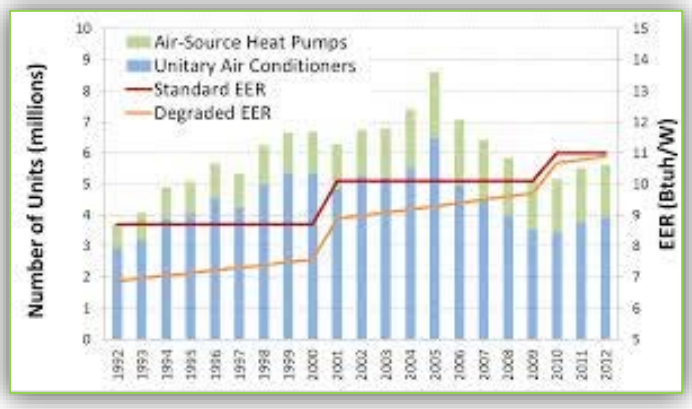
ECM #5 - Air Handling Unit Replacement						
Building	Unit Tag/Fan	Fan Motor HP	Replacement Motor Efficiency (Nmotor)	HRS	Demand Savings	Energy Savings(kWh)
Administration	AH-1 SF	10.0	91.7%	3,391	1.76	6,621
	AH-1 RF	3.0	89.5%	2,745	0.54	1,647
	AH-2 SF	7.5	91.0%	3,391	1.33	5,004
	AH-2 RF	2.0	86.5%	2,745	0.37	1,136
Courthouse	HVAC-1	7.5	91.0%	3,391	1.33	5,004
	HVAC-2	5.0	89.5%	2,745	0.90	2,746
Justice Complex	AHU-1 SF	30.0	94.1%	4,067	5.14	23,214
	AHU-1 RF	15.0	93.0%	3,391	2.60	9,792
	AHU-2 SF	20.0	93.0%	3,391	3.47	13,056
	AHU-2 RF	10.0	91.7%	3,391	1.76	6,621
	AHU-3 SF	30.0	94.1%	4,067	5.14	23,214
	AHU-3 RF	15.0	93.0%	3,391	2.60	9,792
	AHU-4 SF	20.0	93.0%	3,391	3.47	13,056
	AHU-4 RF	10.0	91.7%	3,391	1.76	6,621
	AHU-6 SF	10.0	91.7%	3,391	1.76	6,621
	AHU-7 SF	7.5	91.0%	3,391	1.33	5,004

ECM 6 – Rooftop Unit Replacement

Background & Existing Conditions

The Prosecutor's Office has (3) existing Trane Packaged Rooftop Units that are approaching the end of their useful life. (1) Trane Intellipak Model # SXHFC60E0F56C89 and (2) Trane Precedent Units Model # TCD090D300BC.

Many commercial buildings are operating with older and inefficient HVAC systems. The average life expectancy of commercial HVAC RTU equipment is 10 to 15 years—which means that many commercial buildings are ready for new natural gas rooftop units. Technology improvements and demand have led to greater energy efficiency and more choices in systems. Installing new, higher efficiency units will provide energy savings as well as deliver enhanced technology and controls of the RTUs when compared to the existing units.



Scope of Work

Install (3) new packaged rooftop units.

- Conduct through structural integrity of roof or dunnage mounted equipment
- Conduct integrity test of pad mounted equipment
- Repair or replace structural system for new roof mounted equipment
- Coordinate installation time and duration to ensure operations are unaffected
- Develop site crane plan for lifts required
- Set adapter curbs (if required)
- Lift (or set) new RTUs into place
- Ensure any flashing is properly sealed to roof structure
- Connect new ductwork transitions
- Connect electrical system to new HVAC
- Provide new DDC controls for HVAC system
- Start-up of HVAC of equipment by manufacturer
- Provide efficiency test of new system
- Test and commission new HVAC system

ECM Calculations

Energy Savings from the installation of new higher efficiency packaged rooftop units are based on the reduction in Electrical Consumption and Electrical Demand resulting from the increased efficiency of the baseline RTU to the new RTU as well as the addition of Dual Enthalpy Economizers for each unit. Per BPU Protocols, those formulas are as follows:

Electric HVAC Systems

The measurement of energy and demand savings for C/I Efficient HVAC program for Room AC, Central AC, and air cooled DX is based on algorithms. (Includes split systems, air to air heat pumps, packaged terminal systems, water source heat pumps, central DX AC systems, ground water or ground source heat pumps)

Algorithms

Air Conditioning Algorithms:

Demand Savings = (BtuH/1000) X ($1/EER_b$-$1/EER_q$) X CF

Energy Savings = (BtuH/1000) X ($1/EER_b$-$1/EER_q$) X EFLH

Definition of Variables

BtuH = Cooling capacity in Btu/Hour – This value comes from ARI/AHRI or AHAM rating or manufacturer data.

CF = Coincidence Factor – This value represents the percentage of the total load which is on during electric system's Peak Window. This value will be based on existing measured usage and determined as the average number of operating hours during the peak window period.

EFLH = Equivalent Full Load Hours – This represents a measure of energy use by season during the on-peak and off peak periods. This value will be determined by existing measured data of kWh during the period divided by kW at design conditions.

HVAC and Heat Pumps

Component	Type	Value	Source
BtuH	Variable	ARI/AHRI or AHAM or Manufacturer Data	Application
EER_b	Variable	See Table below	Collaborative agreement and C/I baseline study
EER_q	Variable	ARI/AHRI or AHAM Values	Application
CF	Fixed	67%	Engineering estimate
EFLH	Fixed	HVAC 1,131 HP cooling 381 HP heating 800	JCP&L metered data[8]

HVAC Baseline Table

Equipment Type	Baseline = ASHRAE Std. 90.1 - 2007
Unitary HVAC/Split Systems, Air Cooled	
· <=5.4 tons:	13 SEER
· >5.4 to 11.25 tons	11 EER
· >11.25 to 20 tons	10.8 EER
.> 21 to 63 tons	9.8 EER
>63 Tons	9.5 EER

Dual Enthalpy Economizers

Algorithms

Energy Savings (kWh) = OTF*SF*Cap/Eff

Demand Savings (kW) = Savings/Operating Hours

Definition of Variables

OTF = Operational Testing Factor

SF = Approximate savings factor based on regional temperature bin data (assume 4576 for equipment under 5.4 tons where a fixed damper is assumed for the baseline and 3318 for larger equipment where a dry bulb economizer is assumed for the baseline). (Units for savings factor are in kWh x rated EER per ton of cooling or kWh*EER/Ton)

Cap = Capacity of connected cooling load (tons)

Eff = Cooling equipment energy efficiency ratio (EER)

Operating Hours = 4,438 = Approximate number of economizer operating hours

Dual Enthalpy Economizers

Component	Type	Value	Source
OTF	Fixed	1.0 when operational testing is performed, 0.8 otherwise	
SF		4576 for equipment under 5.4 tons, 3318 otherwise	1
Cap	Variable		Application
Eff	Variable		Application
Operating Hours	Fixed	4,438	2

Based on BPU Protocols, the energy savings for ECM #6 – Rooftop Unit Replacement are the following:

ECM #6 - Rooftop Unit Replacement								
BUILDING NAME	Qty	Tons	EERb	EERq	CF	EFLH	Demand Savings (kW)	Energy Savings (kWh)
Prosecutor's Office	1	60	9.8	10.5	67%	1,131	3.28	5,539.59
	2	7.5	11.0	12.5	67%	1,131	0.66	2,220.87

ECM #6 - Rooftop Unit Replacement								
BUILDING NAME	Qty	OTF	SF	Cap	EFF	Hours	Demand Savings (kW)	Energy Savings (kWh)
Prosecutor's Office	1	0.8	3,318	60	10.50	4,438	3.42	15,168
	2	0.8	3,318	7.5	12.50	4,438	0.72	3,185

ECM 7 – Cooling Tower Replacement

Background & Existing Conditions

The existing Cooling Tower at the Justice Complex is a Marley Model NC8304 cooling tower with constant volume fan control and has exceeded its useful life.

The tower is not operating at peak efficiency. Thus, replacing a cooling tower near or at the end of its ASHRAE useful service life would increase the system's efficiency by decreasing the condenser water temperature and allow for more heat to be transferred from the chilled water return to the condenser water return. A new tower with VFD on the tower fan will also use less fan energy.

Scope of Work

- Demolish existing Cooling Tower at the Justice Complex
  - Drain down the existing Cooling Tower
  - Disconnect power at the Cooling Tower
  - Remove existing and responsibly dispose of Cooling Tower
  - Note:
    - Demolished equipment will become the property of the demolition contractor.
- Furnish and Install new Cooling Tower
  - New Cooling Tower will be resized to match the new chillers
  - Furnish and install new structural steel (as required)
  - Install new pipe, valves, & fittings
  - Install insulation on new piping
  - Install necessary sensors, wells, and flow meters as required for complete system. Sensors, wells, and flow meters will be provided by the EMS Contractor.
  - Install new self-sensing VFD System Pumps
  - Reconnect existing chilled and condenser water piping to the new Tower
  - Installation check, start-up, performance test, & functional testing on the water cooled chiller system
- Note:
  - Cost of new DDC Controls for the Cooling Tower is carried in ECM #2.

ECM Calculations

Energy Savings from the Cooling Tower Replacement are based on the reduction in Electric Consumption resulting from premium efficiency motors and the addition of Variable Frequency Drives on Cooling Tower Fan and the Condenser Water Pumps. Per BPU Protocols, those formulas are as follows:

Motors

For premium efficiency motors 1-200 HP.

Algorithms

From application form calculate ΔkW where:

$$\Delta kW = 0.746 * HP * IF_{VFD} * (1/\eta_{base} - 1/\eta_{prem})$$

Demand Savings = (ΔkW) X CF

Energy Savings = (ΔkW)*HRS * LF

Definition of Variables

ΔkW = kW Savings at full load

HP = Rated horsepower of qualifying motor, from nameplate/manufacturer specs.

LF = Load Factor, percent of full load at typical operating condition

IF_{VFD} = VFD Interaction Factor, 1.0 without VFD, 0.9 with VFD

η_{base} = Efficiency of the baseline motor

η_{prem} = Efficiency of the energy-efficient motor

HRS = Annual operating hours

CF = Coincidence Factor

Motors

Component	Type	Value	Source
HP	Variable	Nameplate/Manufacturer Spec. Sheet	Application
LF	Fixed	0.75	1
hp_{base}	Fixed	EPACT Baseline Efficiency Table	EPACT Directory
hp_{prem}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
IF_{VFD}	Fixed	1.0 or 0.9	3
Efficiency - η_{ee}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
CF	Fixed	0.74	1
HRS	Fixed	Annual Operating Hours Table	1

EPAct Baseline Motor Efficiency Table

Motor Horsepower	1200 RPM (6 pole)		1800 RPM (4 pole)		3600 RPM (2 pole)	
	ODP	TEFC	ODP	TEFC	ODP	TEFC
1	0.8	0.8	0.825	0.825	na	0.755
1.5	0.84	0.855	0.84	0.84	0.825	0.825
2	0.855	0.865	0.84	0.84	0.84	0.84
3	0.865	0.875	0.865	0.875	0.84	0.855
5	0.875	0.875	0.875	0.875	0.855	0.875
7.5	0.885	0.895	0.885	0.895	0.875	0.885
10	0.9002	0.895	0.895	0.895	0.885	0.895
15	0.902	0.902	0.91	0.91	0.895	0.902
20	0.91	0.902	0.91	0.91	0.902	0.902
25	0.917	0.917	0.917	0.924	0.91	0.91
30	0.924	0.917	0.924	0.924	0.91	0.91
40	0.93	0.93	0.93	0.93	0.917	0.917
50	0.93	0.93	0.93	0.93	0.924	0.924
60	0.936	0.936	0.936	0.936	0.93	0.93
75	0.936	0.936	0.941	0.941	0.93	0.93
100	0.941	0.941	0.941	0.945	0.93	0.936
125	0.941	0.941	0.945	0.945	0.936	0.945
150	0.945	0.95	0.95	0.95	0.936	0.945
200	0.945	0.95	0.95	0.95	0.945	0.95

*Note: For the Direct Install Program, different baseline efficiency values are used.

NEMA Premium Motor Efficiency Table

Motor Horsepower	1200 RPM (6 pole)		1800 RPM (4 pole)		3600 RPM (2 pole)	
	ODP	TEFC	ODP	TEFC	ODP	TEFC
1	0.825	0.825	0.855	0.855	0.77	0.77
1.5	0.865	0.875	0.865	0.865	0.84	0.84
2	0.875	0.885	0.865	0.865	0.855	0.855
3	0.885	0.895	0.895	0.895	0.855	0.865
5	0.895	0.895	0.895	0.895	0.865	0.885
7.5	0.902	0.91	0.91	0.917	0.885	0.895
10	0.917	0.91	0.917	0.917	0.895	0.902
15	0.917	0.917	0.93	0.924	0.902	0.91
20	0.924	0.917	0.93	0.93	0.91	0.91
25	0.93	0.93	0.936	0.936	0.917	0.917
30	0.936	0.93	0.941	0.936	0.917	0.917
40	0.941	0.941	0.941	0.941	0.924	0.924
50	0.941	0.941	0.945	0.945	0.93	0.93
60	0.945	0.945	0.95	0.95	0.936	0.936
75	0.945	0.945	0.95	0.954	0.936	0.936
100	0.95	0.95	0.954	0.954	0.936	0.941
100	0.95	0.95	0.954	0.954	0.941	0.95
150	0.954	0.958	0.958	0.958	0.941	0.95
200	0.954	0.958	0.958	0.962	0.95	0.954

Annual Operating Hours Table

Motor Horsepower	Operating Hours, HRS
1 to 5 HP	2,745
6 to 20 HP	3,391
21 to 50 HP	4,067
51 to 100 HP	5,329
101 to 200 HP	5,200

Variable Frequency Drives

The measurement of energy and demand savings for C/I Variable Frequency Drive for VFD applications is for HVAC fans, water pumps, boiler feed water pumps and draft fans only. VFD applications for other than this use should follow the custom path.

Algorithms

Energy Savings (kWh) = $0.746*HP*HRS*(ESF/\eta_{motor})$

Demand Savings (kW) = $0.746*HP*(DSF/\eta_{motor})$

Definitions of Variables

HP = nameplate motor horsepower or manufacturer spec. sheet per application

η_{motor} = Motor efficiency at the peak load. Motor efficiency varies with load. At low loads relative to the rated hp (usually below 50%) efficiency often drops dramatically.

ESF = Energy Savings Factor. The energy savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions.

DSF = Demand Savings Factor. The demand savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions

HRS = annual operating hours

Variable Frequency Drives

Component	Type	Value	Source
Motor HP	Variable	Nameplate/Manufacturer Spec. Sheet	Application
η_{motor}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
ESF	Variable	See Table Below	Connecticut Ligh and Power
DSF	Variable	See Table Below	Connecticut Ligh and Power
HRS	Variable	>2,000	Application

VFD Savings Factors

Component	Energy Savings Factor, ESF	Demand Savings Factor, DSF
Airfoil/Backward Inclined Fans	0.475	0.448
Forward Curved Fans	0.240	0.216
Chilled Water Pumps	0.580	0.201
Cooling Tower Fans	0.580	0.000

Based on BPU Protocols, the energy savings for ECM #7 – Cooling Tower Replacement are the following:

Motor Efficiency Savings

ECM #7 - Cooling Tower Replacement											
Building	Unit Tag/Fan	Motor HP	Existing Motor Efficiency (Nbase)	Replacement Motor Efficiency (Nprem)	LF	CF	IFvfd	HRS	ΔkW	Demand Savings	Energy Savings(kWh)
Justice Complex	CT Fan	25.0	91.7%	93.6%	0.75	0.74	1.0	4,067	0.4128	0.31	1,259.28
	CWP-1	30.0	92.4%	94.1%	0.75	0.74	1.0	2,034	0.4376	0.32	667.35
	CWP-2	30.0	92.4%	94.1%	0.75	0.74	1.0	2,034	0.4376	0.32	667.35
TOTALS		85								0.32	2,594

VFD Savings

ECM #7 - Cooling Tower Replacement					
Building	Unit Tag/Fan	Fan Motor HP	Replacement Motor Efficiency (Nmotor)	HRS	Energy Savings(kWh)
Justice Complex	CT Fan	25.0	93.6%	4,067	47,001
	CWP-1	30.0	94.1%	2,034	11,607
	CWP-2	30.0	94.1%	2,034	11,607
TOTALS		85			70,215

ECM 8 - Cooling Tower Fan VFD

Background & Existing Conditions

The Cooling Tower located on the East Wing of the Courthouse is in good condition and will not need to be replaced. However, the tower fan is constant volume. Adding a VFD to the Cooling Tower will save energy. Also, with the addition of a new chiller, the chilled water system can use optimized operational sequences to maximize the use of the fan VFD.

Scope of Work

- Remove existing motor starter
- Furnish and Install new Cooling Tower Fan VFD with bypass – NEMA 4 Enclosure
- Note:
  - Cost of new DDC Controls for the Cooling Tower Fan VFD is carried in ECM #2.

ECM Calculations

Energy Savings from the Cooling Tower Fan VFD are based on the reduction in Electric Consumption resulting from the addition of Variable Frequency Drives on Cooling Tower Fan. Per BPU Protocols, that formula is as follows:

Variable Frequency Drives

The measurement of energy and demand savings for C/I Variable Frequency Drive for VFD applications is for HVAC fans, water pumps, boiler feed water pumps and draft fans only. VFD applications for other than this use should follow the custom path.

Algorithms

Energy Savings (kWh) = $0.746*HP*HRS*(ESF/\eta_{motor})$

Demand Savings (kW) = $0.746*HP*(DSF/\eta_{motor})$

Definitions of Variables

HP = nameplate motor horsepower or manufacturer spec. sheet per application

η_{motor} = Motor efficiency at the peak load. Motor efficiency varies with load. At low loads relative to the rated hp (usually below 50%) efficiency often drops dramatically.

ESF = Energy Savings Factor. The energy savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions.

DSF = Demand Savings Factor. The demand savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions

HRS = annual operating hours

Variable Frequency Drives

Component	Type	Value	Source
Motor HP	Variable	Nameplate/Manufacturer Spec. Sheet	Application
η_{motor}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
ESF	Variable	See Table Below	Connecticut Ligh and Power
DSF	Variable	See Table Below	Connecticut Ligh and Power
HRS	Variable	>2,000	Application

VFD Savings Factors

Component	Energy Savings Factor, ESF	Demand Savings Factor, DSF
Airfoil/Backward Inclined Fans	0.475	0.448
Forward Curved Fans	0.240	0.216
Chilled Water Pumps	0.580	0.201
Cooling Tower Fans	0.580	0.000

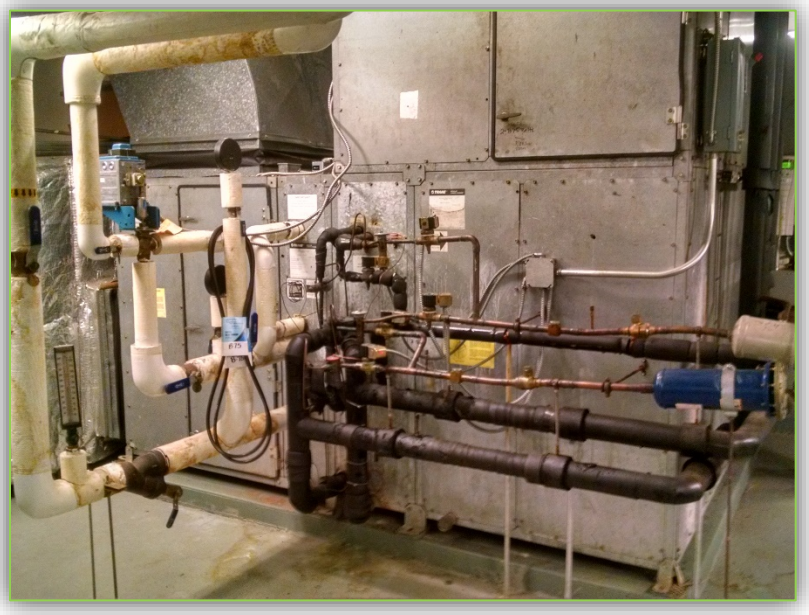
ECM #8 - Cooling Tower Fan VFD

Building	Unit Tag/Fan	Fan Motor HP	Replacement Motor Efficiency (Nmotor)	HRS	Energy Savings(kWh)
Courthouse	CT Fan	15.0	93.0%	3,391	23,665

ECM 9 – DX to CHW Conversion

Background & Existing Conditions

The PEER Building has (4) Air Handling Units serving a VAV System for the entire building. Each AHU has a Hot Water Pre-Heat Coil and a DX Cooling Coil. The Supply Fan for each unit is already equipped with a VFD. The DX Condensing Units for each AHU are installed on the roof and have multiple compressors with R22 Refrigerant. Converting this system from a DX system to chilled water will result in energy savings.

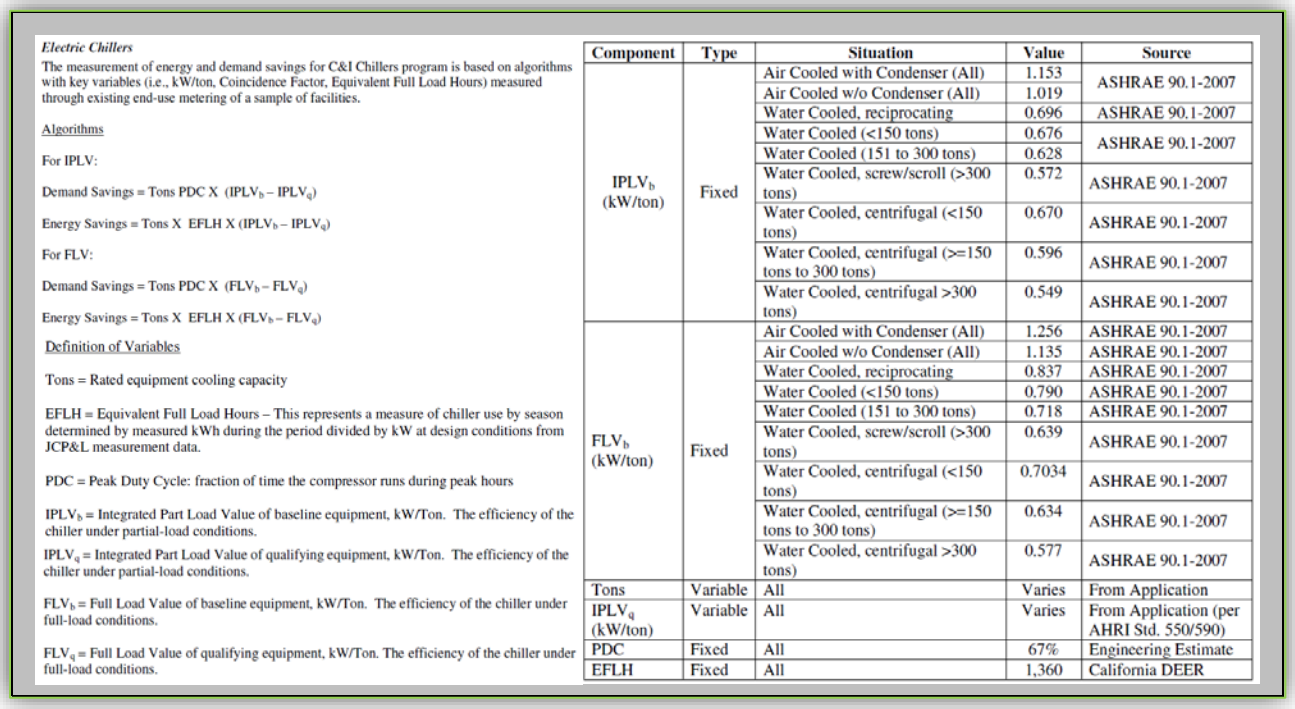


Scope of Work

- Demolish existing Condensing Units at the PEER Building
  - Disconnect power at the Condensing Unit
  - Reclaim and responsibly dispose of refrigerant
  - Remove existing and responsibly dispose of Condensing Unit
  - Remove the DX Coils from each AHU
  - Note:
    - Demolished equipment will become the property of the demolition contractor.
- Furnish and Install new Air Cooled Chiller
  - New chiller to be sized to match the Cooling Load of the building
  - Chiller to be provided with integral pumping package.
  - Furnish and install on existing structural steel
  - Install new pipe, valves, & fittings
  - Install insulation on new piping
  - Install necessary sensors, wells, and flow meters as required for complete system. Sensors, wells, and flow meters will be provided by the EMS Contractor.
  - Install new Chilled Water Coils in each of the existing AHUs
  - Installation check, start-up, performance test, & functional testing on the water cooled chiller system

ECM Calculations

Energy Savings from the installation of new higher efficiency chillers are based on the reduction in Electrical Consumption and Electrical Demand resulting from the increased efficiency of the baseline Chiller to the new Chiller. Per BPU Protocols, that formula is as follows:



Electric Chillers

The measurement of energy and demand savings for C&I Chillers program is based on algorithms with key variables (i.e., kW/ton, Coincidence Factor, Equivalent Full Load Hours) measured through existing end-use metering of a sample of facilities.

Algorithms

For IPLV:

Demand Savings = Tons PDC X ($IPLV_b - IPLV_q$)

Energy Savings = Tons X EFLH X ($IPLV_b - IPLV_q$)

For FLV:

Demand Savings = Tons PDC X ($FLV_b - FLV_q$)

Energy Savings = Tons X EFLH X ($FLV_b - FLV_q$)

Definition of Variables

Tons = Rated equipment cooling capacity

EFLH = Equivalent Full Load Hours – This represents a measure of chiller use by season determined by measured kWh during the period divided by kW at design conditions from JCP&L measurement data.

PDC = Peak Duty Cycle: fraction of time the compressor runs during peak hours

$IPLV_b$ = Integrated Part Load Value of baseline equipment, kW/Ton. The efficiency of the chiller under partial-load conditions.

$IPLV_q$ = Integrated Part Load Value of qualifying equipment, kW/Ton. The efficiency of the chiller under partial-load conditions.

FLV_b = Full Load Value of baseline equipment, kW/Ton. The efficiency of the chiller under full-load conditions.

FLV_q = Full Load Value of qualifying equipment, kW/Ton. The efficiency of the chiller under full-load conditions.

Component	Type	Situation	Value	Source
$IPLV_b$ (kW/ton)	Fixed	Air Cooled with Condenser (All)	1.153	ASHRAE 90.1-2007
		Air Cooled w/o Condenser (All)	1.019	
		Water Cooled, reciprocating	0.696	ASHRAE 90.1-2007
		Water Cooled (<150 tons)	0.676	ASHRAE 90.1-2007
		Water Cooled (151 to 300 tons)	0.628	
		Water Cooled, screw/scroll (>300 tons)	0.572	ASHRAE 90.1-2007
		Water Cooled, centrifugal (<150 tons)	0.670	ASHRAE 90.1-2007
		Water Cooled, centrifugal (>=150 tons to 300 tons)	0.596	ASHRAE 90.1-2007
		Water Cooled, centrifugal >300 tons)	0.549	ASHRAE 90.1-2007
FLV_b (kW/ton)	Fixed	Air Cooled with Condenser (All)	1.256	ASHRAE 90.1-2007
		Air Cooled w/o Condenser (All)	1.135	ASHRAE 90.1-2007
		Water Cooled, reciprocating	0.837	ASHRAE 90.1-2007
		Water Cooled (<150 tons)	0.790	ASHRAE 90.1-2007
		Water Cooled (151 to 300 tons)	0.718	ASHRAE 90.1-2007
		Water Cooled, screw/scroll (>300 tons)	0.639	ASHRAE 90.1-2007
		Water Cooled, centrifugal (<150 tons)	0.7034	ASHRAE 90.1-2007
		Water Cooled, centrifugal (>=150 tons to 300 tons)	0.634	ASHRAE 90.1-2007
		Water Cooled, centrifugal >300 tons)	0.577	ASHRAE 90.1-2007
Tons	Variable	All	Varies	From Application
$IPLV_q$ (kW/ton)	Variable	All	Varies	From Application (per AHRI Std. 550/590)
PDC	Fixed	All	67%	Engineering Estimate
EFLH	Fixed	All	1,360	California DEER

Based on BPU Protocols, the energy savings for ECM #4 – Chiller Replacement are the following:

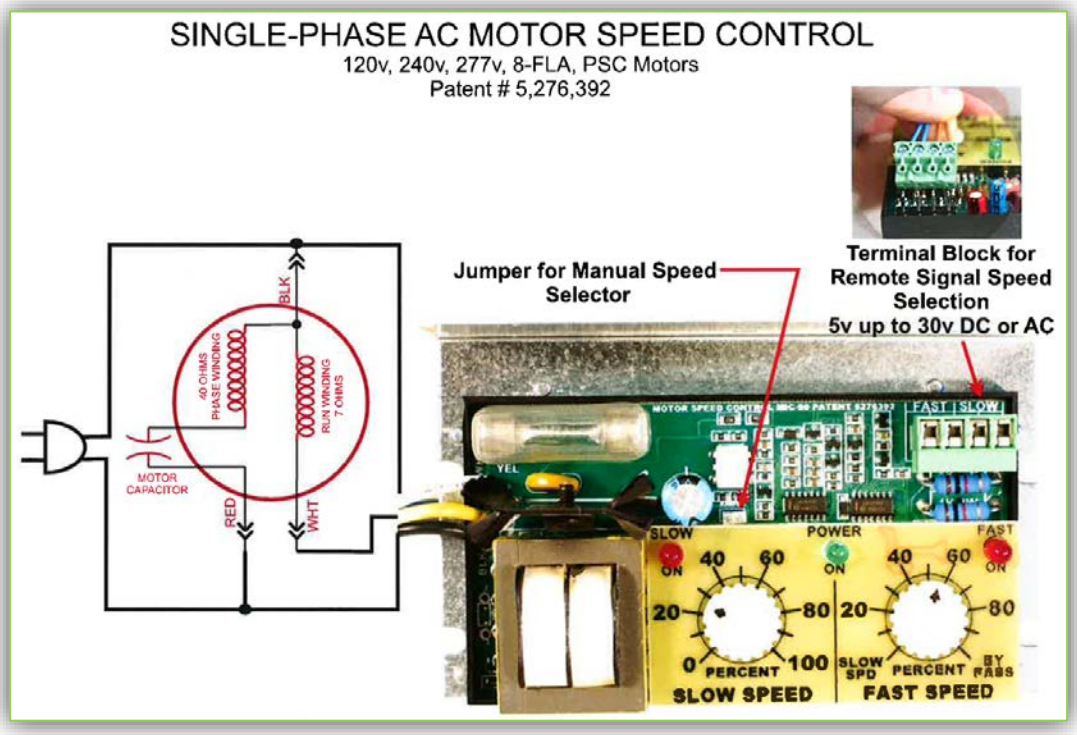
ECM #9 - DX To CHW Conversion									
BUILDING NAME	Size (Sq Ft)	Qty	Tons	EFLH	FLVb	FLVq	PDC	Demand Savings (kW)	Energy Savings (kWh)
P.E.E.R. Building/Parking Garage	504,670	1	155	1,360	1.256	1.148	67%	0.84	22766

ECM #9 - DX to CHW Conversion					
Building	Unit Tag/Fan	Pump Motor HP	Motor Efficiency	HRS	Energy Consumption (kWh)
P.E.E.R. Building/Parking Garage	CHWP	25.0	93.6%	1,392	(27,736)

ECM 10 – FCU Fan Speed Controller

Background & Existing Conditions

The Administration Building and the Courthouse contain 188 Fan Coil Units. Each of these units has a single phase fan motor that operates at full speed. Single-Phase AC Motor Speed Control added to each of the Fan Coil Units will save fan energy for each of the units in addition to providing tighter temperature control.



Each single phase motor speed controller will provide the following features:

- Accepts 120V, 240V, 277V AC Single Phase PSC Motors, 8 FLA
- Measures 4.5” X 2.5” X 2.3” and can fit into the end pocket of an FCU
- Low voltage input terminal block is available for input from the EMS System
- Two inputs select two speeds or single input varies speed in desired range
- A jumper sets the manual only controlled speed

Scope of Work

- Install single phase motor speed controller on each FCU
- Connect inputs to the EMS
- Balance each FCU using new controller

ECM Calculations

Energy Savings from the FCU Fan Speed Controllers are based on the reduction in Electric Consumption resulting from the addition of Fan Speed Control for each FCU. Per BPU Protocols, that formula is as follows. ***(ESF for Airfoil Fans was used)***:

Variable Frequency Drives

The measurement of energy and demand savings for C/I Variable Frequency Drive for VFD applications is for HVAC fans, water pumps, boiler feed water pumps and draft fans only. VFD applications for other than this use should follow the custom path.

Algorithms

Energy Savings (kWh) = $0.746*HP*HRS*(ESF/\eta_{motor})$

Demand Savings (kW) = $0.746*HP*(DSF/\eta_{motor})$

Definitions of Variables

HP = nameplate motor horsepower or manufacturer spec. sheet per application

η_{motor} = Motor efficiency at the peak load. Motor efficiency varies with load. At low loads relative to the rated hp (usually below 50%) efficiency often drops dramatically.

ESF = Energy Savings Factor. The energy savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions.

DSF = Demand Savings Factor. The demand savings factor is calculated by determining the ratio of the power requirement for baseline and VFD control at peak conditions

HRS = annual operating hours

Variable Frequency Drives

Component	Type	Value	Source
Motor HP	Variable	Nameplate/Manufacturer Spec. Sheet	Application
η_{motor}	Variable	Nameplate/Manufacturer Spec. Sheet	Application
ESF	Variable	See Table Below	Connecticut Ligh and Power
DSF	Variable	See Table Below	Connecticut Ligh and Power
HRS	Variable	>2,000	Application

VFD Savings Factors

Component	Energy Savings Factor, ESF	Demand Savings Factor, DSF
Airfoil/Backward Inclined Fans	0.475	0.448
Forward Curved Fans	0.240	0.216
Chilled Water Pumps	0.580	0.201
Cooling Tower Fans	0.580	0.000

ECM #10 - Fan Speed Controller Savings

Building	Quantity	Fan Motor HP	Replacement Motor Efficiency (Nmotor)	HRS	Energy Savings(kWh)
Administration	93	0.25	80.0%	3,391	34,922
Courthouse	95	0.25	80.0%	3,391	35,673

ECM 11 – Domestic Hot Water Heater Upgrade

Background & Existing Conditions

The following buildings contain existing domestic hot water tanks.

- Courthouse
- Prosecutor's Office
- Administration Building
- PEER Building

In a storage (tank) water heater, water is kept hot and ready for use in insulated storage tanks with capacities ranging from 20 to 400 gallons. Many fuel options are available, including electricity, natural gas, oil, and propane. One drawback of these units is the energy used to keep the water hot, otherwise known as "standby losses."

Condensing gas water heaters are high efficiency domestic water heaters and would save significant energy versus the existing domestic water heater.

Scope of Work

- Check existing service records
- Ensure drainage is locally available to installation location
- Coordinate installation time and duration to ensure operations are unaffected
- Lock-out tag-out of circuits on the electric water heater circuits
- Removal and disposal of existing domestic water heater
- Pipe Natural Gas to locations for new condensing hot water heater
- Install new flue for gas fired condensing water heaters
- Install new gas fired condensing hot water heater
- Start-up per manufacturer recommendations

ECM Calculations

Energy Savings from the Domestic Hot Water Upgrade are based on the reduction in Electric Consumption resulting from the removal of the existing domestic hot water heaters and replacing them with new gas fired, condensing, hot water heaters. Building demand was calculated and then doubled to cover for point of use heater sizing.

ECM #10 - Domestic Hot Water Upgrade									
BUILDING NAME	Size (Sq Ft)	Existing Tank Size (GAL)	Existing Heater kW	Existing DHW Efficiency	Energy Use Density	DHW Usage (BTU)	New DHW Efficiency	Electrical Savings (kWh)	Gas Savings (Therms)
Court House	108,800	119	12	0.98	1.6	174,080,000	0.90	52059	(1934)
Administration Building	45,500	119	27	0.98	1.6	72,800,000	0.90	21771	(809)
Prosecutor's Office	32,205	75	N/A	0.80	1.6	51,528,000	0.90	N/A	71
P.E.E.R. Building/Parking Garage	61,300	200.00	9.0	0.98	1.6	98,080,000	0.90	29331	(1090)

ECM 12 – Combined Heat & Power

In June of 2015, T&M Engineering conducted a CHP Study for the Justice Complex. This study is the basis for the CHP cost and savings included in the ESIP Project. The CHP used from the study is the 650 KW system identified as "Project C: Microgrid with HW & CHW" or "Option 3".

A full copy of the application has been provided for review in Appendix H. See below for the basic consumption and generation numbers used in the ESIP Project. These numbers can be found on page 13 of the CHP Application.

ECM #12 - CHP Savings	
Electric Generation (kWh)	**4,516,985**
CHP Recovered Heat	**Units**
Space Heating (mmBtu)	6,352
Domestic Heating (mmBtu)	3,285
Sub-Total	9,637
Heating Efficiency	72.7%
Natural Gas Saved (mmBtu)	13,256
CHP Gas Used (mmBtu)	40,656
Net Gas Savings (mmBtu)	(27,400)
Net Gas Savings (Therms)	(274,000)

Notes:

- 600 kW Savings for the CHP are included in the ESIP Project
- The Electric Output of 4,516,985 kWh is carried in the ESIP Project
- A Gas Consumption of –274,000 Therms is carried in the ESIP Project calculations.
- The Electric Savings of running the absorption chiller versus the electric chiller are not carried in the project.

ECM 13 - Commissioning

Background & Existing Conditions

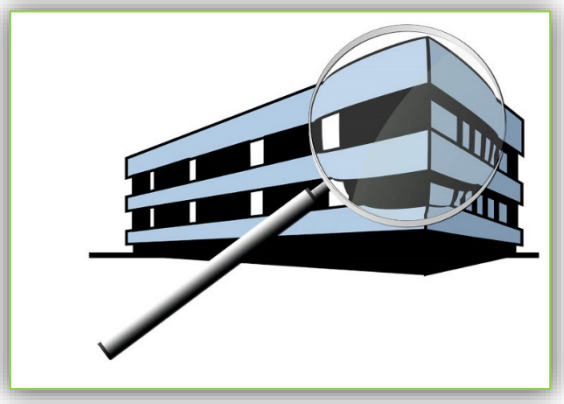
The commissioning of new systems to assure that they function as designed is a critical aspect of energy projects. However, when most existing buildings were built, energy efficiency was not a major concern. Nor have many commercial and institutional buildings undergone a comprehensive quality assurance program for their building systems. Even if the building automation system, for example, were correctly installed and commissioned when the building was new 20 years ago, it may not be programmed properly for today's operations. Adding to the complexity, building documentation often is incomplete, with components and equipment missing or incorrectly installed.

The result is a building using more energy to accomplish less. Even if it were fully commissioned when built, the building may not be operating at peak efficiency today. A comprehensive testing of building systems with the goal of improving quality — retro-commissioning — allows building deficiencies to be identified and corrected for optimum energy use.

Retro-commissioning is a systematic process to improve an existing building's performance. Using a whole-building systems approach, retro-commissioning seeks to identify operational improvements that will increase occupant comfort and save energy.

Commissioning and Retro-commissioning consists of four phases.

1. Design Phase
2. Construction Phase
3. Performance Phase
4. Post Occupancy Phase



Scope of Work

Design Phase

- Prepare a preliminary commissioning plan that outlines the extent of the commissioning program for both new systems and existing systems.
- In coordination with DCO Energy, prepare and format the required specification sections for systems to be commissioned and submit to the design professionals for inclusion in their final submission.
- Perform design review of MEP concepts for the Schematic, Design Development, and Construction Phase drawings and specifications.

Construction Phase

- Prepare and submit a construction phase commissioning plan to Ocean County and DCO Energy before the first construction phase commissioning meeting.
- Schedule the construction phase commissioning coordination meeting within 60 days of construction contract award. At this meeting, the complete commissioning process and construction phase commissioning plan will be reviewed in detail. Tentative schedules will be established for building systems orientation and installation verifications, O&M submittals, owner training, pipe and duct system flushing and testing requirements, start-up, test and balance (TAB) work and performance verification testing.
- Receive and review the equipment submittals for systems to be commissioned. Provide written comments.
- Check equipment installation against contract documents for adequate accessibility for maintenance and component replacement or repair. Provide and complete field installation verification reports for each component and system.
- Witness equipment, subsystem and system installation, start-up and testing for systems to be commissioned. Develop and perform functional performance test reports for start-up of the systems to be commissioned.
- Prior to the field test and balance work, meet with the TAB contractor. The TAB contractor is to outline the TAB procedures and get agreement from the HVAC design professional and the commissioning authority. The commissioning authority will verify that the air and hydronic balancing work are performed correctly and to the published procedural standards of the TAB firm's national certifying organization, i.e., NEBB or AABC.

Performance Phase

- Develop and conduct the performance verification tests for systems to be commissioned. The test data, along with the installation verification, start-up and functional test sheets, will be included in the commissioning report.
- During performance verification, the systems will not only be tested, but also optimized, by the commissioning team. This means optimizing the systems to operate at the best level of operational and energy performance using the given systems. Performance optimization includes adjustments of set points and schedules, and correction of control sequences.

Post Occupancy Phase

- Ensure that O&M manuals and other as-built records for commissioned systems have been updated to include modifications made during the construction phase. Request revisions to achieve accuracy.
- Training coordination for commissioned systems and documented verification of operator training.
- Develop a systems manual for commissioned systems. This manual provides for a standardized arrangement of O&M documents verified for application to the actual equipment installed.
- Prepare a commissioning report for commissioned systems. Installation, start-up, functional test and performance verification reports shall be included in the report, along with an up-to-date commissioning issues log.
- Repeat performance verification tests to accommodate opposite-season testing and oversee any corrections of performance deficiencies.
- Perform ongoing visits for the first year of occupancy as required to address space use needs, system issues, and to verify performance of commissioned systems.

ECM Calculations

Commissioning Savings is based on a 1% Reduction in Electrical and Natural Gas Consumption. Those savings are detailed below.

ECM #13 - Commissioning			
BUILDING NAME	**Size (Sq Ft)**	**kWh Saved**	**Therms Saved**
Court House	**108,800**	**18,625**	**333**
Administration Building	**45,500**	**16,938**	**306**
New Jail	**168,000**	**24,999**	**577**
Prosecutor's Office	**32,205**	**3,536**	**112**
Justice Complex	**163,600**	**40,797**	**2,459**
P.E.E.R. Building/Parking Garage	**504,670**	**16,669**	**418**

Note:

- To account for a potential billing anomaly, the gas consumption for the month of April, 2014 was removed from the gas savings calculation for the Justice Complex

ENERGY SAVINGS PLAN

SECTION 4 – FINANCIAL ANALYSIS

FORM VI

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ESCO's PRELIMINARY ANNUAL CASH FLOW ANALYSIS FORM
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: DCO Energy

Note: Respondents must use the following assumptions in all financial calculations:

(a) The cost of all types of energy should be assumed to inflate at **2.4% gas, 2.2% electric per year and**

1. Term of Agreement: 20 years
2. Construction Period [(2)] (months): 12 Months
3. Cash Flow Analysis Format:

Project Cost (1): **$15,736,469**
Cost of Issuance **$142,000**
Total Project: **$15,878,469**

Interest Rate to be Used for Proposal Purposes **2.28%**

Year	Annual Energy Savings	Annual Operational Savings	Energy Rebates/Incentives	Total Annual Savings	Annual Project Costs	Board Costs	Annual Service Costs	Net Cash-Flow to Client	Cumulative Cash Flow
Installation	$ 263,994			$ 263,994	$ (233,433)			$ 30,561	$ 30,561
Year 1	$ 740,516	$ 38,862	$ 646,641	$ 1,426,019	$ (1,416,019)			$ 10,000	$ 40,561
Year 2	$ 756,422	$ 39,756	$ 866,096	$ 1,662,275	$ (1,652,275)			$ 10,000	$ 50,561
Year 3	$ 772,670	$ 40,670	$ 227,925	$ 1,041,265	$ (1,031,265)			$ 10,000	$ 60,561
Year 4	$ 789,265	$ 41,606		$ 830,871	$ (820,871)			$ 10,000	$ 70,561
Year 5	$ 806,216	$ 42,563		$ 848,779	$ (838,779)			$ 10,000	$ 80,561
Year 6	$ 823,529			$ 823,529	$ (813,529)			$ 10,000	$ 90,561
Year 7	$ 841,214			$ 841,214	$ (831,214)			$ 10,000	$ 100,561
Year 8	$ 859,277			$ 859,277	$ (849,277)			$ 10,000	$ 110,561
Year 9	$ 877,727			$ 877,727	$ (867,727)			$ 10,000	$ 120,561
Year 10	$ 896,572			$ 896,572	$ (886,572)			$ 10,000	$ 130,561
Year 11	$ 915,820			$ 915,820	$ (905,820)			$ 10,000	$ 140,561
Year 12	$ 935,481			$ 935,481	$ (925,481)			$ 10,000	$ 150,561
Year 13	$ 955,562			$ 955,562	$ (945,562)			$ 10,000	$ 160,561
Year 14	$ 976,073			$ 976,073	$ (966,073)			$ 10,000	$ 170,561
Year 15	$ 997,023			$ 997,023	$ (987,023)			$ 10,000	$ 180,561
Year 16	$ 1,018,421			$ 1,018,421	$ (1,008,421)			$ 10,000	$ 190,561
Year 17	$ 1,040,277			$ 1,040,277	$ (1,030,277)			$ 10,000	$ 200,561
Year 18	$ 1,062,601			$ 1,062,601	$ (1,052,601)			$ 10,000	$ 210,561
Year 19	$ 1,085,402			$ 1,085,402	$ (1,075,402)			$ 10,000	$ 220,561
Year 20	$ 1,108,692			$ 1,108,692	$ (1,098,692)			$ 10,000	$ 230,561
Totals	$ 18,258,758	$ 203,457	$ 1,740,663	$ 20,466,872	$ (20,236,311)	$ -	$ -	$ 230,561	

NOTES:
(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"
(2) No payments are made by the Board during the construction period.
(3) Installation Year payment is Interest Payment

Note: Maintenance escalation rate of 2.3% used.

FORM V

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ESCOs PROPOSED FINAL PROJECT COST FORM FOR BASE CASE PROJECT
Ocean County
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: DCO Energy

PROPOSED CONSTRUCTION FEES

Fee Category	Fees [1] Dollar ($) Value	Percentage of Hard Costs
Estimated Value of Hard Costs [2]	$ 12,927,355	
Contingency/Non-Energy Related Projects	$ -	
	$ 12,927,355	
Project Service Fees		
Investment Grade Energy Audit	$ 168,056	1.30%
Design Engineering Fees	$ 1,036,774	8.02%
Construction Management & Project Administration	$ 400,748	3.10%
System Commissioning	$ 87,906	0.68%
Equipment Initial Training Fees	$ 64,637	0.50%
ESCO Overhead	$ 389,113	3.01%
ESCO Profit	$ 661,881	5.12%
ESCO Termination Fee	$ -	0.00%
Project Service Fees Sub Total	$ 1,758,120	13.68%
TOTAL FINANCED PROJECT COSTS:	$ 15,736,469	21.81%
ESCO Termination Fee (To be paid only if the District decides not to proceed beyond the ESP)		

PROPOSED ANNUAL SERVICE FEES

First Year Annual Service Fees	Fees [1] Dollar ($) Value	Percentage of Hard Costs
SAVINGS GUARANTEE (*OPTION*)	$78,857	0.61%
Measurement and Verification *(Associated with Savings Guarantee Option)*	$27,147	0.21%
ENERGY STAR Services (optional)	$0	
Post Construction Services *(if applicable)*	$0	
Performance Monitoring	w/ M&V	
On-going Training Services	w/ M&V	
Verification Reports	w/ M&V	
TOTAL FIRST YEAR ANNUAL SERVICES	$106,004	

ENERGY SAVINGS PLAN

SECTION 5 – PROJECT IMPLEMENTATION STRATEGY

ASSESSMENT OF RISKS, DESIGN & COMPLIANCE ISSUES

Moving from a conceptual design to engineered documents DCO has identified areas of the project that could change during the detailed design, construction and post-construction. The table below represents potential areas of concern that will need to be investigated further with a corresponding party responsible for the compliance of each item.

Issue	Category	Responsible Party
Alteration of expected Maintenance and Operational Savings	Risk	Ocean County
Disposition of Abandoned Equipment (Steam Piping, Condensate Piping, Oil Tanks, etc.)	Risk	Ocean County
New Natural Gas Distribution	Risk	Ocean County
Integrity of re-used Infrastructure	Risk	Ocean County
Life Safety System Coordination	Risk	Ocean County
Coordination with Ocean County Information Technology Department	Risk	Ocean County
Ventilation Compliance With Code	Compliance	Consulting Engineer
Temperature, Humidity and Air Change Compliance with Code	Compliance	Consulting Engineer
Boiler Capacity And Turndown	Design	Consulting Engineer
Natural Gas Regulator Compliance with PSE&G	Compliance	Consulting Engineer

Issue	Category	Responsible Party
Undocumented Underground Utilities	Risk	Consulting Engineer
Code Compliance of Existing Electrical Infrastructure	Compliance	Consulting Engineer
Lighting Levels	Compliance	Consulting Engineer
Design Light Consortium rating for bulbs	Compliance	Consulting Engineer
Underwriters Laboratory Testing for retrofitted LED Lighting Systems	Compliance	Consulting Engineer
Lighting Retrofits within hard ceilings for fixtures and occupancy sensors	Risk	Consulting Engineer
Street/Parking Lot Pole Structural Integrity	Risk	Consulting Engineer
Unrealized Energy Savings 1. Energy Modeling 2. Performance Monitoring 3. Capacity Of Equipment 4. Efficiency Of Equipment 5. Run Hours Of Equipment	Risk	DCO/ Consulting Engineer 1. DCO 2. DCO 3. Consulting Engineer / Basis of Design Vendor 4. Consulting Engineer / Basis of Design Vendor 5. Ocean County
Adaptation To New RTUs (Curb, Electric, Ductwork, Condensate)	Design	Consulting Engineer / Basis Of Design Manufacture
Structural Loads For Rooftop Equipment Replacement	Design	Consulting Engineer
Transformer Loading	Risk	Consulting Engineer
Site Work For Equipment	Design	Consulting Engineer

Issue	Category	Responsible Party
Condition Of Roof Under Units	Risk	Consulting Engineer
Adequate Crane Lifts & Clearances	Design	Consulting Engineer / Rigger
Physical Space Constraints And Clearance For Equipment Replacement	Design	Consulting Engineer
Refrigerant Reclaim / Refrigerant Disposal	Compliance	Contractor
Existing Tie In Locations	Design	Consulting Engineer
Schedule Oversight	Risk	DCO Energy
Impact Of Boiler Flue	Design	Consulting Engineer
Impact Of Space Usage During Construction	Risk	Consulting Engineer & Ocean County
Scope changes relating to requests by Authorities Having Jurisdiction.	Risk	Ocean County (via contingency)
Department of Environmental Protection Permitting	Risk	Consulting Engineer
Modifications of Energy Saving Control Sequences and Setpoints impacting Energy Savings and Incentives	Risk	Ocean County
Post Construction Calibration of Sensors, Meters, & Safety Devices	Risk	Ocean County
Adequate time and access for bidding contractor site surveys	Risk	Ocean County

MEASUREMENT & VERIFICATION (M&V) PLAN

Our approach to M&V of energy savings aligns with the International Performance Measurement & Verification Protocol. More detailed information may be found at www.ipmvp.org. It's most cost-effective to perform M&V using the least costly option that still adequately documents system performance and permits analysis of savings. This approach lowers the total cost of the program leaving more dollars available to perform more facility improvements. Depending upon which ECMs are implemented by County of Ocean, the M&V plan proposed by DCO would incorporate one or more of the following options which outlines the four most common approaches for M&V:

Option A – Retrofit Isolation with Key Parameter Measurement	This option is based on a combination of measured and estimated factors when variations in factors are not expected. Measurements are spot or short-term and are taken at the component or system level, both in the baseline and post-installation cases. Measurements should include the key performance parameter(s) which define the energy use of the ECM. Estimated factors are supported by historical or manufacturer's data. Savings are determined by means of engineering calculations of baseline and post-installation energy use based on measured and estimated values.	Direct measurements and estimated values, engineering calculations and/or component or system models often developed through regression analysis. Adjustments to models are not typically required.
Option B – Retrofit Isolation with Parameter Measurement	This option is based on periodic or continuous measurements of energy use taken at the component or system level when variations in factors are expected. Energy or proxies of energy use are measured continuously. Periodic spot or short-term measurements may suffice when variations in factors are not expected. Savings are determined form analysis of baseline and reporting period energy use of proxies of energy use.	Direct measurements, engineering calculations, and/or component or system models often developed through regression analysis. Adjustments to models may be required.`
Option C – Utility Data Analysis	This option is based on long-term, continuous, whole-building utility meter, facility level, or sub-meter energy (or water) data. Savings are determined from analysis of baseline and reporting period energy data. Typically, regression analysis is conducted to correlate with and adjust energy use to independent variables such as weather, but simple comparisons may also be used.	Based on regression analysis of utility meter data to account for factors that drive energy use. Adjustments to models are typically required.
Option D – Calibrated Computer Simulation	Computer simulation software is used to model energy performance of a whole-facility (or sub-facility). Models must be calibrated with actual hourly or monthly billing data from the facility. Implementation of simulation modeling requires engineering expertise. Inputs to the model include facility	Based on computer simulation model calibrated with whole-building or end-use metered data or both.

	characteristics; performance specifications of new and existing equipment or systems; engineering estimates, spot-, short-term, or long-term measurements of system components; and long-term whole-building utility meter data. After the model has been calibrated, savings are determined by comparing a simulation of the baseline with either a simulation of the performance period or actual utility data	Adjustments to models are required.

Each of the options can be used for a wide array of energy efficiency upgrades and each has different costs and complexities associated with it. When selecting an M&V approach, the following general rule of thumb can be applied:

OPTION A

- When magnitude of savings is low for the entire project or a portion of the project
- The risk for not achieving savings is low

OPTION B

- For simple equipment replacement projects
- When energy savings values per individual measure are desired
- When interactive effects are to be ignored or are estimated using estimating methods that do not involve long term measurements
- When sub-meters already exist that record the energy use of subsystems under consideration

OPTION C

- For complex equipment replacement and controls projects
- When predicted energy savings are in excess of 10 to 20 percent as compared with the record energy use
- When energy savings per individual measure are not desired
- When interactive effects are to be included
- When the independent variables that affect energy use are complex and excessively difficult or expensive

OPTION D

- When new construction projects are involved
- When energy savings values per measure are desired
- When Option C tools cannot cost effectively evaluate particular measures or their interactions with the building when complex baseline adjustments are anticipated

DCO will perform measurement and verification of the energy units savings at the conclusion of each month in the first year of the energy units guarantee. After the first year, M&V will be performed and presented within 30 days of year end. County of Ocean will work with DCO to provide necessary information and provide access to any buildings to allow DCO to properly verify and measure energy savings. DCO's energy guarantee will be based on units of energy saved as determined from the baseline provide in the RFP, or adjusted baseline if original baseline is determined by both parties to be inaccurate.

Adjustments to the baseline and associated savings will be taken for weather, hours of operation, building usage, utility rates increases, code or statute changes, requirements listed in Table 1, and any other actions that adversely affect the savings beyond the control of DCO. Any savings discrepancies will be resolved to the satisfaction of both the County of Ocean and DCO in a timely manner.

MAINTENANCE PLAN

Owner Tasks and Responsibilities:

As a general statement, County of Ocean or its 3rd party service providers shall be responsible for providing ongoing maintenance through the duration of the M&V period. DCO will review operational procedures and schedules associated with such things as the building automation/control upgrades as well as the manufacturers' published requirements for installed equipment be it: quarterly, semi-annually or annually. In most cases, County of Ocean is already aware of or self-implementing similar maintenance practices on campus or has contracted a 3rd party for such services. Failure to properly maintain the equipment may cause energy savings goals to fall short.

Specific Areas of Consideration:

In order to sustain energy savings County of Ocean's Staff will be required to implement new maintenance tasks and even modify existing policies and practices. Outlined are two examples of specific instances.

Example 1. Advanced Building Operations Programming:

County of Ocean will be given specific training on the changes and advancements in the environmental operations and energy savings strategies. County of Ocean will be responsible for following the agreed upon guidelines associated with programmed schedules and any use of override functions.

Example 2. Verification of Proper Operations: Mechanical Equipment

County of Ocean will be required to assure that proper mechanical maintenance continues to be implemented on its mechanical equipment. For example, outside air dampers will require proper operation with the appropriate seals in order to maintain ECM(s) such as demand ventilation. DCO will periodically spot check system operations to verify the Owner or its 3rd party representative is implementing proper maintenance. Any deficiencies that may be identified will be brought to County of Ocean's attention for correction.

ENERGY SAVINGS PLAN

SECTION 6 – OPERATION & MAINTENANCE

It is critical to the success of achieving continued energy savings that County of Ocean develop and implement an Operation and Maintenance Plan. In this section are some recommendations for maintenance tasks for various pieces of equipment and systems to assist County of Ocean and/or 3rd party maintenance contractors.

COMPREHENESIVE ANNUAL INSPECTION (AHU)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Inspect the unit for cleanliness.
   b) Inspect the fan wheel and shaft for wear and clearance.
   c) Check the sheaves and pulleys for wear and alignment.
   d) Check the belts for tension, wear, cracks, and glazing.
   e) Verify tight bolts, set screws, and locking collars.
   f) Check dampers for wear, security and linkage adjustment.
   g) Verify clean condensate pan.
   h) Verify proper operation of the condensate drain.
   i) Verify clean air filters.
   j) Verify clean coils.
   k) Verify proper operation of the spray pump, if applicable.
   l) Verify smooth fan operation.
   m) Log operating conditions after system has stabilized.
   n) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.
4. **Lubrication**
   a) Lubricate the fan shaft bearings, if applicable.

b) Lubricate the motor bearings, if applicable.

5. **Controls and Safeties**
   a) Test the operation of the low temperature safety device, if applicable.
   b) Test the operation of the high static pressure safety device, if applicable.
   c) Test the operation of the low static pressure safety device, if applicable.
   d) Check the thermal cutout on electric heaters, if applicable.
   e) Check the step controller, if applicable.
   f) Check and record supply air and control air pressure, if applicable.
   g) Verify the operation of the control system and dampers while the fan is operating.
6. **Motor and Starter**
   a) Clean the starter and cabinet.
   b) Inspect the wiring and connections for tightness and signs of overheating and discoloration. This includes wiring to the electric heat, if applicable.
   c) Check the condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
   e) Meg the motor and record readings.

HEATING INSPECTION (AHU)

1. **Gas Heat Option**
   a) Visually inspect the heat exchanger.
   b) Inspect the combustion air blower fan, and clean, if required.
   c) Lubricate the combustion air blower fan motor, if applicable.
   d) Verify the operation of the combustion air flow-proving device.
   e) Test the operation of the high gas pressure safety device, if applicable. Calibrate, if necessary.
   f) Test the operation of the low gas pressure safety device, if applicable. Calibrate, if necessary.
   g) Verify the operation of the flame detection device.
   h) Test the operation of the high temperature limit switch.
   i) Verify the integrity of the flue system.
   j) Verify the operation of the operating controls.
   k) Verify the burner sequence of operation.
   l) Verify proper gas pressure to the unit and/or at the manifold, if applicable.
   m) Perform combustion test. Make adjustments as necessary.
2. **Electric Heat Option**
   a) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   b) Check and calibrate operating and safety controls, if applicable.
   c) Verify the operation of the heating elements.
   d) Check voltage and amperage and compare readings with the watt rating on the heater.

3. **Hot Water / Steam Heat Option**
   a) Inspect control valves and traps.
   b) Check and calibrate operating and safety controls.
   c) Verify the operation of the heating coils.
   d) Verify the operation of the unit low temperature safety device.

SCHEDULED RUNNING INSPECTION (AHU)

1. Check the general condition of the fan.
2. Verify smooth fan operation.
3. Check and record supply and control air pressure, if applicable.
4. Verify the operation of the control system.
5. Log the operating conditions after the system has stabilized.
6. Review operating procedures with operating personnel.
7. Provide a written report of completed work, operating log, and indicate uncorrected deficiencies detected.

OIL SAMPLE/SPECTROGRAPHIC ANALYSIS

1. Pull oil sample for spectrographic analysis.

REFRIGERANT SAMPLE/ANALYSIS

1. Pull refrigerant sample for spectrographic analysis for contaminants (oil, water, and acid), using approved containers.

ANNUAL MAINTENANCE (BOILERS)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Secure and drain the boiler.
   b) Open the fire and water side for cleaning and inspection.
   c) Check heating surfaces and water side for corrosion, pitting, scale, blisters, bulges, and soot.
   d) Inspect refractory.
   e) Clean fire inspection glass.
   f) Check blow-down valve packing, and lubricate.
   g) Check and test boiler blow-down valve.

h) Perform hydrostatic test, if required.
i) Verify proper operation of the level float.
j) GAS TRAIN BURNER ASSEMBLY
   1. Check the gas train isolation valves for leaks.
   2. Check the gas supply piping for leaks.
   3. Check the gas pilot solenoid valve for wear and leaks.
   4. Check the main gas and the pilot gas regulators for wear and leaks.
   5. Test the low gas pressure switch. Calibrate and record setting.
   6. Test the high gas pressure switch. Calibrate and record setting.
   7. Verify the operation of the burner fan air flow switch.
   8. Inspect and clean the burner assembly.
   9. Inspect and clean the pilot igniter assembly.
   10. Inspect and clean the burner fan.
   11. Run the fan and check for vibration.
   12. Inspect the flue and flue damper.
   13. Burner Control Panel:
      a) Inspect the panel for cleanliness.
      b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
k) Clean burner fan wheel and air dampers. Check fan for vibration.
l) Verify tightness on linkage set screws.
m) Check gas valves for leakage (where test cocks are provided).
n) Verify proper operation of the feed water pump.
o) Verify proper operation of the feed water treating equipment.

4. Controls and Safeties

a) Disassemble and inspect low water cutoff safety device.
b) Reassemble boiler low water cutoff safety device with new gaskets.
c) Clean contacts in program timer, if applicable.
d) Check the operation of the low water cutoff safety device and feed controls.
e) Verify the setting and test the operation of the operating and limit controls.
f) Verify the operation of the water level control.

STARTUP/CHECKOUT PROCEDURE (BOILERS)

1. Verify proper water level in the boiler
2. Test the safety/relief valve after startup (full pressure test).
3. Clean or replace fuel filters.
4. Clean fuel nozzles.
5. Inspect, clean, and functionally test the flame scanner and flame safeguard relay.

6. Clean and adjust the ignition electrode.
7. Replace the vacuum tube in the flame safeguard control, if applicable.
8. Perform pilot turn down test.
9. Verify proper steam pressure.
10. Perform combustion test and adjust the burner for maximum efficiency.
11. Test the following items:
    a) Firing rate
    b) Fuel/air ratio
    c) CO2
    d) CO
    e) NOX
    f) Perform smoke test.
12. Review operating procedures.
13. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

MID-SEASON RUNNING INSPECTION (BOILERS)

1. Check the general condition of the unit.
2. Inspect the burner.
3. Adjust the burner controls to obtain proper combustion.
4. Check the operation of the pressure relief valve.
5. Check the operation of the low water cutoff and feed controls.
6. Check the setting and test the operation of the operating and limit controls.
7. Check the operation of the modulating motor.
8. Lift the safety/relief valves with at least 70% of rated pressure.
9. Blow down and try gauge cocks to confirm glass water level.
10. Check and test boiler blow down valve.
11. Log operating conditions after the system has stabilized.
12. Review operating procedures.
13. Provide a written report of completed work, operating log, and indicate uncorrected deficiencies detected.

SEASONAL SHUT-DOWN PROCEDURE (BOILERS)

1. Shut down boiler at boiler controls.
2. Shut off fuel lines at main valves.
3. Review operating procedures.

4. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

STARTUP/CHECKOUT PROCEDURE (COOLING TOWER)

1. Fill the basin and verify the float level.
2. Verify the operation of the basin heaters.
3. Verify the operation, setpoint, and sensitivity of the basin heater temperature control device.
4. Start the condenser water pumps.
5. Verify the balance of the return water through the distribution boxes.
6. Verify proper operation of the bypass valve(s), if applicable.
7. Operate fan and verify smooth operation.
8. Log operation after system has stabilized.
9. Review operating procedures.
10. Provide a written report of completed work, operating log, and indicate uncorrected deficiencies detected.

COMPREHENSIVE ANNUAL INSPECTION (COOLING TOWER)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly

a) STRUCTURE
   1. Disassemble screens and access panels for inspection.
   2. Inspect the conditions of the slats, if applicable.
   3. Inspect the condition of the tower fill.
   4. Inspect the condition of the support structure.
   5. Inspect the condition of the basins (upper and lower) and/or spray nozzles.
   6. Verify clean basins and strainer(s).
   7. Verify the condition and operation of the basin fill valve system.

b) MECHANICAL
   4. Inspect belts for wear, cracks, and glazing.
   5. Verify correct belt tension. Adjust the tension as necessary.
   6. Inspect sheaves and pulleys for wear, condition, and alignment.
   7. Inspect fan shaft and bearings for condition.

8. Inspect fan assembly for condition, security, and clearances. (e.g., blade tip clearance).

4. Lubrication System

a) Lubricate motor bearings.
b) Lubricate fan shaft bearings.

5. Motor And Starter

a) Clean the starter and cabinet.
b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
c) Check the condition of the contacts for wear and pitting.
d) Check the contactor(s) for free and smooth operation.
e) Meg the motor(s) and record readings.
f) Check disconnect terminal block for wear, tightness and signs of overheating and discoloration.
g) Check the condition and operation of the basin heater contactor(s).

SHUT-DOWN PROCEDURE (COOLING TOWER)

1. Check the general condition of the tower.
2. Turn off electrical power to basin heaters, tower fans, and pipe heaters as necessary.
3. Drain tower and condenser water piping.
4. Review operating procedures.
5. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

GAS TRAIN (BURNERS)

1. Check the gas train isolation valves for leaks.
2. Check the gas supply piping for leaks.
3. Check the gas pilot solenoid valve for wear and leaks.
4. Check the main gas and the pilot gas regulators for wear and leaks.
5. Test the low gas pressure switch. Calibrate and record setting.
6. Test the high gas pressure switch. Calibrate and record setting.
7. Verify the operation of the burner fan air flow switch.
8. Inspect and clean the burner assembly.
9. Inspect and clean the pilot ignitor assembly.
10. Inspect and clean the burner fan.
11. Run the fan and check for vibration.
12. Inspect the flue and flue damper.

13. Burner Control Panel:
    a) Inspect the panel for cleanliness.
    b) Inspect wiring and connections for tightness and signs of overheating.
14. Clean burner fan wheel and air dampers. Check the fan for vibration.
15. Verify tightness of the linkage set screws.
16. Check the gas valves against leakage (where test cocks are provided)

OIL TRAIN (BURNERS)

1. Check the gas train isolation valves for leaks.
2. Check the gas supply piping for leaks.
3. Check the gas pilot solenoid valve for wear and leaks.
4. Check the main gas and the pilot gas regulators for wear and leaks.
5. Test the low gas pressure switch. Calibrate and record setting.
6. Test the high gas pressure switch. Calibrate and record setting.
7. Verify the operation of the burner fan air flow switch.
8. Inspect and clean the burner assembly.
9. Inspect and clean the pilot ignitor assembly.
10. Inspect and clean the burner fan.
11. Run the fan and check for vibration.
12. Inspect the flue and flue damper.
13. Burner Control Panel:
    a) Inspect the panel for cleanliness.
    b) Inspect wiring and connections for tightness and signs of overheating.
14. Clean burner fan wheel and air dampers. Check the fan for vibration.
15. Verify tightness of the linkage set screws.
16. Check the gas valves against leakage (where test cocks are provided).

DUAL FUEL TRAIN (BURNERS)

1. Check the gas train isolation valves for leaks.
2. Check the gas supply piping for leaks.
3. Check the gas pilot solenoid valve for wear and leaks.
4. Check the main gas and the pilot gas regulators for wear and leaks.
5. Test the low gas pressure switch. Calibrate and record setting.
6. Test the high gas pressure switch. Calibrate and record setting.
7. Verify the operation of the burner fan air flow switch.

8. Inspect and clean the burner assembly.
9. Inspect and clean the pilot ignitor assembly.
10. Inspect and clean the burner fan.
11. Run the fan and check for vibration.
12. Inspect the flue and flue damper.
13. Burner Control Panel:
    a) Inspect the panel for cleanliness.
    b) Inspect wiring and connections for tightness and signs of overheating.
14. Clean burner fan wheel and air dampers. Check the fan for vibration.
15. Verify tightness of the linkage set screws.
16. Check the gas valves against leakage (where test cocks are provided).

MAINTENANCE INSPECTION (ENERGY MANAGEMENT SYSTEMS)

1. Review reports for operational problems and trends.
2. Make a back-up copy of the BAS program.
3. Check for loose or damaged parts or wiring.
4. Check for any accumulation of dirt or moisture. Clean if required.
5. Verify proper electrical grounding.
6. Verify control panel power supplies for proper output voltages.
7. Inspect interconnecting cables and electrical connections.
8. Verify that manual override switches are in the desired positions.
9. Check the operation of binary and analog outputs, if applicable.
10. Calibrate control devices, if applicable.
11. Verify the correct time and date.
12. Check and update the holiday schedules and daylight savings time.
13. Via terminal mode, view the event log and input/output points for any unusual status or override conditions.
14. Clean the external surfaces of the panel enclosure.
15. Review operating program and parameters.
16. Check cable connections for security.
17. Review operating procedures.
18. Provide a written report of completed work, and indicate any uncorrected deficiencies detected.

MAINTENANCE INSPECTION (CONTROL PANELS)

1. **Control Panel**
   a) Verify secure connections on internal wiring, LAN, and communication links.
   b) Check for loose or damaged parts or wiring.
   c) Check for any accumulation of dirt or moisture. Clean if required.
   d) Remove excessive dust from heat sink surfaces.
   e) Verify proper system electrical grounding.
   f) Verify proper output voltages on control panel power supplies.
   g) Check LED Indications to verify proper operation.
   h) Verify LAN communications.
   i) Verify that cards are seated and secured.
   j) Check wiring trunks and check for possible Error Code Indications.
   k) Check voltage level.
   l) Verify the proper operation of critical control processes and points associated with this unit an make adjustments if necessary.
   m) Check Volatile memory available.
   n) Check Non-volatile memory available.
   o) Check Processor idle time.
   p) Clean external surfaces of the panel enclosure.
   q) Check modem operation, if applicable.
   r) View the event log and input/output points for any unusual status or override conditions.
   s) Verify correct time and date.
   t) Check and update holiday schedules, if applicable, and daylight savings time.
   u) Review operating procedures with operating personnel.
   v) Provide a written report of completed work, and indicate any uncorrected deficiencies detected.

MAINTENANCE INSPECTION (EMS - SEQUENCE OF OPERATIONS)

Central Plant

In order to assure effective environmental conditioning while minimizing the cost to operate the equipment, technicians will review operating sequences and practices for the chiller plant. An initial survey of current equipment operating parameters will be conducted within the first 60 days of the contract term during cooling season. This survey will include:

1. Chiller(s) operation

2. Cooling tower(s) operation
3. Pump(s) operation
4. Economizer operation (where applicable)
5. Environmental safety

A detailed report of findings and recommendations for changes, if any, will be made. Agreed upon operational changes which require only adjustment of controls or programming will be made during regularly scheduled maintenance visits as part of this agreement at no additional cost. Any recommended alterations that require addition of devices or equipment will be accompanied by a guaranteed cost proposal reflecting the applicable discounts determined by this agreement.

Building Systems

In order to assure effective environmental conditioning while minimizing the cost to operate the equipment, technicians will review operating sequences and practices for covered airside systems. An initial survey of current systems operating parameters will be conducted within the first 60 days of the contract term, except seasonally operated systems, which will be surveyed during the appropriate operating season. This survey will include:

1. Time schedule(s)
2. Reset schedule(s)
3. Economizer changeover (where applicable)
4. Setpoints
5. Energy Management routines

A detailed report of findings and recommendations for changes, if any, will be made. Agreed upon operational changes which require only adjustment of controls or programming will be made during regularly scheduled maintenance visits as part of this agreement at no additional cost. Any recommended alterations that require addition of devices or equipment will be accompanied by a guaranteed cost proposal reflecting the applicable discounts determined by this agreement.

MAINTENANCE PROCEDURE

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Check the general condition of the unit.
   b) Verify tightness of the fan, fan guards, louvers, etc.

c) Verify clean burner assembly.
d) Check sheaves and pulleys for wear and alignment, if applicable.
e) Check belts for tension, wear, cracks, and/or glazing.

4. **Lubrication**
   a) Lubricate the fan motor, if applicable.
   b) Lubricate the fan bearings as necessary.
5. **Controls and Safeties**
   a) Verify proper operation of the temperature control device.
   b) Verify proper operation of the high temperature control device.
   c) Verify proper operation of the fan switch.
   d) Verify proper operation of the pilot safety device, if applicable.
6. **Electrical**
   a) Inspect wiring and connections for tightness and signs of overheating and discoloration.
7. **Startup and Checkout**
   a) Start the unit.
   b) Verify proper combustion air to the burner.
   c) Verify proper gas pressure to the burner.
   d) Check the flame for proper combustion.

COMPREHENSIVE ANNUAL INSPECTION (FANS)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Disassemble screens and panels necessary to gain access to the fan mechanism.
   b) Disassemble the control mechanism (AVPB only).
   c) Clean accessible rotor components to include control pitch mechanism (AVPB only).
   d) Inspect blades for wear.
   e) Inspect blade arms for wear (AVPB only).
   f) Check blade tip clearance.
   g) Check for oil leak on the blade bearing housing (AVPB only).
   h) Clean motor and fan housing.
   i) Reassemble removed screens and plates.
4. **Lubrication**
   a) Lubricate the motor bearings.
   b) Lubricate the shaft bearings (AVPA only).

5. **Controls and Safeties**
   a) Test the operation of the high static safety device. Calibrate and record setting.
   b) Test the operation of the low static safety device. Calibrate and record setting.
   c) Test the operation of the vibration safety device. Calibrate and record setting.
   d) Verify the operation of the phase monitor, if applicable.
   e) Inspect pneumatic and electrical controls for condition and calibration.
   f) Verify proper operation.
6. **Motor and Starter**
   a) Clean the starter and cabinet.
   b) Clean the disconnect switch and cabinet at the fan, if applicable.
   c) Inspect the wiring and connections for tightness and signs of overheating and discoloration.
   d) Check the condition of the contacts for wear and pitting.
   e) Check the contactors for free and smooth operation.
   f) Meg the motor and record readings.
7. **Startup / Checkout Procedure**
   a) Start the fan.
   b) Verify the operation of the starter.
   c) Check and record supply and control air pressure.
   d) Verify the operation of the control system while the fan is operating.
   e) Log the operating conditions after the system has stabilized.
   f) Review operating procedures with operating personnel.
   g) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

SCHEDULED RUNNING INSPECTION (FANS)

1. Check the general operation of the fan.
2. Check and record supply and control air pressure.
3. Verify the operation of the control system.
4. Log the operating conditions after the system has stabilized.
5. Review operating procedures with operating personnel.
6. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

COMPREHENSIVE ANNUAL INSPECTION (FANS)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Verify tight bolts, set screws, and locking collars.
   b) Inspect sheaves and pulleys for wear and alignment.
   c) Inspect belts for tension, wear, cracks, and glazing.
   d) Inspect dampers for wear, security, and clearances, if applicable.
   e) Verify clean air filters.
   f) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.
4. **Lubrication**
   a) Lubricate fan bearings.
   b) Lubricate motor bearings, if applicable.
5. **Controls and Safeties**
   a) Verify the operation of the control system while the fan is operating.
   b) Verify the setting of the low temperature safety device, if applicable.
   c) Verify the operation of the pre-heat control device, if applicable.
   d) Verify the operation of the cooling control device, if applicable.
   e) Verify the operation of the re-heat control device, if applicable.
   f) Verify the operation of the humidity control device, if applicable.
6. **Motor and Starter**
   a) Clean the starter and cabinet.
   b) Inspect the wiring and connections for tightness and signs of overheating and discoloration.
   c) Check the condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
   e) Meg the motor and record readings.
   f) Check volts and amps of the motor.

LUBRICATE/GREASE BEARINGS

1. Lubricate and/or grease bearings according to manufacturer's specifications.

MEG MOTOR

1. Check the integrity of the insulation on the motor windings and the motor leads, using a megohm meter.

MAINTENANCE PROCEDURE (COILS)

1. Record and report abnormal conditions.
2. Visually inspect the coil for leaks.
3. Inspect the coil for cleanliness.

ANNUAL INSPECTION (PUMP)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Check motor shaft and pump shaft for alignment, if applicable.
   b) Inspect the coupling for wear.
   c) Verify that the shaft guard is in place and tight, if applicable.
   d) Verify water flow through the pump.
   e) Check for leaks on the mechanical pump seals, if applicable.
   f) Verify proper drip rate on the pump seal packing, if applicable.
   g) Verify smooth operation of the pump.
   h) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.
4. **Lubrication**
   a) Lubricate the motor bearings as necessary.
   b) Lubricate the pump bearings as necessary.
5. **Motor and Starter**
   a) Clean the starter and cabinet.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Meg the motor.
   d) Verify tight connections on the motor terminals.
   e) Check the condition of the contacts for wear and pitting, if applicable.
   f) Check the contactors for free and smooth operation.
   g) Verify proper volts and amps.

PUMP RUN INSPECTION (PUMP)

1. Verify smooth operation of the pump.
2. Check for leaks on the mechanical pump seals, if applicable.
3. Verify proper drip rate on the pump seal packing, if applicable.
4. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

MECHANICAL STARTERS WITH ELECTRONIC CONTROLS

1. Clean the starter and cabinet.
2. Inspect wiring and connections for tightness and signs of overheating and discoloration.
3. Check condition of the contacts for wear and pitting.
4. Check contactors for free and smooth operation.
5. Check the mechanical linkages for wear, security, and clearances.
6. Verify the overload settings.

COMPREHENSIVE ANNUAL MAINTENANCE (VFD STARTERS)

1. Clean the starter and cabinet.
2. Inspect wiring and connections for tightness and signs of overheating and discoloration.
3. Check the tightness of the motor terminal connections.
4. Verify the operation of the cooling loop.
5. Verify proper operation of the frequency drive.

COMPREHENSIVE ANNUAL MAINTENANCE (RTU)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Inspect for leaks and report results.
   b) Calculate refrigerant loss rate and report to the customer.
   c) Repair minor leaks as required (e.g., valve packing, flare nuts).
   d) Visually inspect condenser tubes for cleanliness.

4. **Controls and Safeties**
   a) Inspect the control panel for cleanliness.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Verify the working condition of indicator/alarm lights, if applicable.
   d) Test the low water temperature control device. Calibrate and record setting.
   e) Test the low evaporator pressure safety device. Calibrate and record setting.
   f) Test the oil pressure safety device. Calibrate and record setting, if applicable.
   g) Check programmed parameters of RCM control, if applicable.
5. **Lubrication System**
   a) Check oil level in the compressor.
   b) Test oil for acid content and discoloration. Make recommendations to the customer based on the results of the test.
   c) Verify the operation of the oil heater. Measure amps and compare reading with the watt rating of the heater.
6. **Motor and Starter**
   a) Clean the starter and cabinet.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Check condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
   e) Check the tightness of the motor terminal connections.
   f) Meg the motor and record readings.
   g) Verify the operation of the electrical interlocks.
   h) Measure voltage and record. Voltage should be nominal voltage ± 10%.

COMPREHENSIVE MAINTANENCE INSPECTION (RTU HEATING CYCLE)

1. Perform heating inspection/maintenance applicable to the unit (steam/hot water, gas, electric).
2. Verify smooth operation of the fans.
3. Check the belts for tension, wear, cracks, and glazing.
4. Verify clean air filters.
5. **Gas Heat Option**
   a) Visually inspect the heat exchanger.
   b) Inspect the combustion air blower fan, and clean, if required.
   c) Lubricate the combustion air blower fan motor, if applicable.
   d) Verify the operation of the combustion air flow-proving device.
   e) Test the operation of the high gas pressure safety device, if applicable. Calibrate, if necessary.

f) Test the operation of the low gas pressure safety device, if applicable. Calibrate, if necessary.
g) Verify the operation of the flame detection device.
h) Test the operation of the high temperature limit switch (i.e., Verify the integrity of the flue system).
i) Verify the operation of the operating controls.
j) Verify the burner sequence of operation.
k) Verify proper gas pressure to the unit and/or at the manifold, if applicable.
l) Perform combustion test. Make adjustments as necessary.

6. **Electric Heat Option**
   a) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   b) Check and calibrate operating and safety controls, if applicable.
   c) Verify the operation of the heating elements.
   d) Check voltage and amperage and compare readings with the watt rating on the heater.
7. **Hot Water / Steam Heat Option**
   a) Inspect control valves and traps.
   b) Check and calibrate operating and safety controls.
   c) Verify the operation of the heating coils.
   d) Verify the operation of the unit low temperature safety device.

MID-SEASON COOLING INSPECTION (RTU)

1. Check the general condition of the unit.
2. Log the operating condition after system has stabilized.
3. Verify the operation of the control circuits.
4. Analyze the recorded data. Compare the data to the original design conditions.
5. Review operating procedures with operating personnel.
6. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

COMPREHENSIVE MAINTANENCE INSPECTION (RTU - COOLING CYCLE)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. **General Assembly**
   a) Inspect for leaks and report results.
   b) Calculate refrigerant loss rate and report to the customer.

c) Repair minor leaks as required (e.g., valve packing, flare nuts).
d) Check pulleys and sheaves for wear and alignment.
e) Check belts for tension, wear, cracks, and glazing.
f) Verify clean evaporator coil, blower wheel, and condensate pan.
g) Verify clean air filters.
h) Verify proper operation of the condensate drain.
i) Verify proper operation of the dampers and/or inlet guide vanes, if applicable.

4. Controls and Safeties

a) Inspect the control panel for cleanliness.
b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
c) Verify the working condition of indicator/alarm lights, if applicable.
d) Test the low evaporator pressure safety device. Calibrate and record setting, if applicable.
e) Test the high condenser pressure safety device. Calibrate and record setting, if applicable.
f) Test the oil pressure safety device, if applicable. Calibrate and record setting.
g) Test the high static pressure safety device, if applicable. Calibrate and record setting.
h) Verify the operation of the static pressure control device, if applicable.

5. Lubrication

a) Verify the operation of the oil heater, if applicable.
b) Lubricate the fan bearings as required.
c) Lubricate the fan motor bearings as required.
d) Lubricate the damper bearings, if applicable.

6. Motor and Starter

a) Clean the starter and cabinet.
b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
c) Check the condition of the contacts for wear and pitting.
d) Check the contactors for free and smooth operation.

7. Startup /Checkout Procedure

a) Verify the operation of the oil heater.
b) Verify full water system, including the cooling tower and the condenser.
c) Verify clean cooling tower and strainers.
d) Test flow-proving devices on the condenser water circuit.
e) Start the condenser water pump and the cooling tower fan(s).
f) Verify flow rate through the condenser.
g) Start the unit.
h) Verify smooth operation of the compressor(s) and fan(s).
i) Check the setpoint and sensitivity of the temperature control device.
j) Verify the operation of the condenser water temperature control device.

k) Verify clean condenser using pressure and temperature.
l) Check operation and setup of the Unit Control Module.
m) Check the superheat and subcooling on the refrigeration circuit(s).
n) Log the operating conditions after the system has stabilized.
o) Review operating procedures with operating personnel.
p) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

ENERGY SAVINGS PLAN

SECTION 7 – OPTIONAL ENERGY GUARANTEE

OPTIONAL ENERGY GUARANTEE OVERVIEW

NOTE: *The following is meant only to serve as a description of an optional energy guarantee and does not constitute any contractual obligations between the County of Ocean and DCO.* If County of Ocean chooses *to implement an energy guarantee contract, a separate document will be used based on mutual agreement and acceptance of parties of its terms and conditions.*

A successful energy project consists of a partnership between an ESCO and Owner. Both parties have defined roles and accept their individual responsibilities as well as support any joint initiatives of the program as defined in the RFP and this document. Both DCO and the County of Ocean will have a role in ongoing maintenance and operations as defined in the agreed-upon energy guarantee contractual documents. Both parties will be required to meet their obligations for the guaranteed energy units savings (referred to as "guarantee" or "savings") to be achieved and to ensure the guarantee stays intact.

DCO will guarantee County of Ocean will achieve 100% of the total energy units savings per the provisions of the agreed-upon energy guarantee contractual documents based on the final selection of ECMs and their associated energy savings as measured and verified by the Owner's third-party, independent firm. The energy savings will be in energy units, not dollars as DCO has no control over the costs of utilities. The energy units guarantee contract shall commence thirty (30) days after the start-up and commissioning of the last Energy Conservation Measure (ECM) and be enforced for a period of fifteen (15) years or until terminated by County of Ocean. If County of Ocean chooses to terminate or buy-out the contract early DCO will refund any unused portion of the associated and mutually, agreed-upon measurement and verification costs. County of Ocean may buy out the energy guarantee at any time by paying DCO a termination fee.

SAVINGS VERIFICATION

There are events that cause energy savings to change. County of Ocean and DCO will agree to baseline energy consumption that represents the facility's energy use and cost prior to the date of any Agreement (the "Base Year") and parameters, which affect the energy usage and cost of the facility, including but not limited to, utility rates, local weather profile, facility square footage, environmental conditions, schedules (e.g., lighting, HVAC) and an inventory of equipment in the facility. Energy savings are determined by comparing measured energy use or demand before and after implementation of an energy savings program.

ECM ENERGY SAVINGS = BASELINE ENERGY USE – POST INSTALLATION ENERGY USE +/- ADJUSTMENTS

Changes in estimated energy savings fall into two categories. These categories are Routine Adjustments and Non-Routine Adjustments. Routine Adjustments are expected changes during the savings reporting period to energy governing factors (e.g., weather). DCO uses IPMVP approved mathematical techniques to determine adjustments. Non-Routine Adjustments include energy-governing factors which are not usually expected to change, such as the facility size, the design and operation of installed equipment, occupancy and the type of occupants or any physical changes to the building or equipment that impact the facilities' utility use. These factors will be monitored for change throughout the reporting period.

DCO will perform monthly utility bill analysis and audit reports which compare the current year with base year energy consumption and costs. DCO will perform periodic on-site analysis to determine whether mechanical and electrical systems are operating at optimal efficiency and to assess the occupancy and operational schedules of the buildings.

ENERGY SAVINGS PLAN

APPENDICIES

APPENDIX LIST	
APPENDIX A	Construction Contingency Allowance
APPENDIX B	Design Bid Build Procedures
APPENDIX C	Operations & Maintenance Savings
APPENDIX D	Project Changes in Financing
APPENDIX E	Incentives In Debt Service
APPENDIX F	Operating Conditions
APPENDIX G	Lighting Line-By-Line
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ENERGY SAVINGS PLAN

APPENDIX A

CONSTRUCTION CONTINGENCY ALLOWANCE

APPENDIX A – CONSTRUCTION CONTIGNENCY ALLOWANCE

During the construction phase there are four categories of potential change of scope issues that benefit from having Construction Contingency Allowance (CCA).

- Unknown conditions
- Building inspector's modifications
- Project owner requested changes
- Design clarifications or modifications

Unknown Conditions

Renovations to older facilities have greater potential for revealing the unknown. Missing or inaccurate blueprints, deviations from the original blue prints by the original builder and unknown or undocumented modifications during the life of the facility are just a few examples.

Areas such as behind a wall/roof/equipment or under the slab can bring unforeseen conditions which can delay the new construction and change the anticipated scope of the work. This is why it is advisable to dedicate a CCA that is higher than that for new construction.

Building Inspection Modifications

A plan review by the local building jurisdiction reviews the construction documents prior to issuing a building permit. However, there remains the likelihood that the building inspector will request modifications to the plans based upon experience and their interpretation of the applicable building code.

While we can ask for code review and documentation if you hope to get a Certificate of Occupancy under a tight schedule from this same inspector, requested modifications will need to be implemented as successful appeals take time.

Whether it is adding an extra exit sign, smoke detector or fire extinguisher, or whether it is something more significant, it will make more work for the contractor, thus an added expense. The CCA is intended to be the source of funds necessary for these requested modifications.

Project Owner Requested Changes

It is nearly impossible to express your every desire during the design phase. You will always see something during construction that you would like to change. There is nothing necessarily wrong with that. The CCA is intended to be the source of funds necessary for these requested changes.

Design Clarifications or Modifications

No designer has ever developed the perfect set of construction documents.

There are always items that can be detailed better or more clearly. The design intent should be adequately reflected in the drawings and specifications so that the contractor can bid and build the ECM to meet the design intent.

However, there will be times during construction when the builder will not be readily able to identify the exact intent of particular details or systems. At that time the builder will submit a Request For Information (RFI) to the designer for clarification or more information. The designer will issue clarifications or directives so that the builder can continue to meet the design intent.

On occasion, the RFI will reveal that something more than was shown in the construction documents is necessary to fulfill the design intent. The clarification or modification may impact the scope of the work to a degree that additional construction costs become necessary.

As long as the design omission is not negligent, the CCA is intended to be the source of funds necessary for these design clarifications or modifications.

Allowance Method

1. Each bid package will instruct bidders to carry a lump sum allowance as listed.
    a. Allowance Amount (10% of Hard Costs)

BID PACKAGE ALLOWANCE SCHEDULE	
ECM	Allowance Amount
Combined Heat and Power	$410,000
Energy Management System	$194,978
Boiler Replacement	$179,786
Lighting Replacement (LED)	$113,950
Air Handling Unit Replacement	$102,998
Chiller Replacement	$66,228
Cooling Tower Replacement	$17,439
Roof Top Unit Replacement	$14,209
FCU Fan Speed Controller	$7,614
Domestic Hot Water Heater Upgrade	$6,750
Cooling Tower VFD	$2,650
DX To CHW Conversion	N/A
TOTAL	**$1,116,601**

2. An allowance adjustment request will be generated through and RFI and/or change order request through the contractor.
    a. Allowance will be carried as line item in contractors AIA schedule of values
    b. DCO ESIP Fee will be carried on allowance.
3. If under $3,000 and time is critical DCO has the authority to authorize the allowance adjustment.

4. If over $3,000 and/or the time is not critical DCO will present, by the next project status meeting:
    a. Type of allowance adjustment:
        - Unknown conditions
        - Building inspector's modifications
        - Project owner requested changes
        - Design clarifications or modifications
    b. Engineer's opinion on if the requested allowance adjustment is part of the base scope
    c. Allowance Impact on:
        i. ESIP Budget
        ii. Remaining Allowance
        iii. Energy Savings
        iv. Incentive
        v. Project Schedule
        vi. Operations and Maintenance Budget
5. Client will then approve or deny the construction allowance.
6. If approved DCO will authorize contractor to lower allowance line item and add line item in the same amount for authorized work.
7. At the end of the project if there is a remaining allowance DCO will issue deduct change order request to client to remove remaining allowance and credit owner.
8. In the event a particular bid package's contingency is below 0.5% of hard cost DCO will submit a change order to transfer contingency from another bid package.

Project total construction contingency allowance amount is 10% of hard costs or $TBD and is agreed upon.

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ENERGY SAVINGS PLAN

APPENDIX B

DESIGN BID BUILD

APPENDIX B – DESIGN-BID-BUILD PROCEDURES

Design–bid–build (or **design/bid/build**, and abbreviated **D–B–B** or **D/B/B** accordingly), also known as **Design–tender** (or "design/tender") **traditional method** or **hard bid** is the method of delivery for this project.

Design–bid–build is the traditional method for project delivery and differs in several substantial aspects from design–build.

There are three main sequential phases to the design–bid–build delivery method:

- The design phase
- The bidding (or tender) phase
- The construction phase

Design Phase

In this phase DCO will design and produce bid documents, including construction drawings and technical specifications, on which various contractors will in turn bid to construct the project.

The Energy Savings Plan (ESP) is intended to document owner's project requirements and provide a conceptual and/or schematic design and good faith estimates.

With the ESP DCO will bring in other design professionals including mechanical, electrical, and plumbing engineers (MEP engineers), a fire protection engineer, structural engineer, sometimes a civil engineer and a landscape architect to help complete the construction drawings and technical specifications.

The design document should reflect the intent of the Energy Savings Plan for scope, price, savings, operations & maintenance savings, incentive and schedule.

The finished bid documents are coordinated by the DCO and owner for issuance to contractors during the bid phase.

Bid (or tender) phase

Bidding is according to NJ Public Bid Law and is "open", in which any qualified bidder may participate.

The various contractors bidding obtain bid documents, and then put them out to multiple subcontractors for bids on sub-components of the project.

Questions may arise during the bid period, and DCO will issue clarifications or corrections to the bid documents in the form of addenda.

From these elements, the contractor compiles a complete bid for submission by the established closing date and time bid date.

Bids are be based on a base bid lump sum plus alternates, bid requirements and alternates are elucidated within the bid documents.

Once bids are received, DCO reviews the bids, seeks any clarifications required of the bidders, investigates contractor qualifications, ensures all documentation is in order (including bonding if required), and advises the owner as to the ranking of the bids.

If the bids fall in a range acceptable to the owner, the project is awarded to the contractor with the lowest reasonable bid.

In the event that the bids do not satisfy the needs of the owner the following options become available to DCO:

- Re-bid the construction of the project on a future when monies become available and/or construction costs go down.
- Revise the design of that ECM (at no cost to the client) so as to make the project smaller, or reduce features or elements of the project to bring the cost down. The revised bid documents can then be issued again for bid.
    - DCO will provide guidance on energy savings, operation and maintenance savings and incentives to ensure the project is self-funding.
- Revise the design of future ECM(s) (at no cost to the client) so as to make the project smaller, or reduce features or elements of the project to bring the cost down. The current bid package can then be contracted.
    - DCO will provide guidance on energy savings, operation and maintenance savings and incentives to ensure the project is self-funding.

Construction phase

Once the construction of the project has been awarded to the contractor, the bid documents (e.g., approved construction drawings and technical specifications) may not be altered.

The necessary permits (for example, a building permit) must be achieved from jurisdictional authorities in order for the construction process to begin.

Should design changes be necessary during construction, whether initiated by the contractor, owner, or as discovered by the architect, DCO will issue sketches or written clarifications and handle the project through allowance (See Appendix A).

The contractor may be required to document "as built" conditions to the owner.

Bidding Method

1. To achieve energy savings and fund debt service payments as rapidly as possible the bid packages will be bid in the following order:

BID METHOD SCHEDULE		
ECM	Cost + Allowance	Savings
Combined Heat and Power	$4,489,500	$257,281
Lighting Replacement (LED)	$1,253,449	$288,044
Energy Management System	$2,144,762	$72,661
Commissioning	$215,640	$18,991
Boiler Replacement	$1,977,650	$52,776
Air Handling Unit Replacement	$1,132,974	$17,899
Chiller Replacement	$728,503	$1,843
Cooling Tower Replacement	$191,829	$8,737
Roof Top Unit Replacement	$156,295	$3,157
FCU Fan Speed Controller	$83,754	$8,471
Domestic Hot Water Heater Upgrade	$74,250	$8,411
Cooling Tower VFD	$29,150	$2,840
DX To CHW Conversion	N/A	N/A
TOTAL	**$12,477,756**	**$741,112.06**

2. If bids in group 1 (Green) are within 15% of budget value they will be awarded.
3. Bids in group 2 (Yellow) may be value engineered from the project to meet budget.
    a. DCO will provide the impact of ECMs value engineered:
        i. Energy Savings
        ii. Operations and Maintenance Savings
        iii. Incentive
4. Bids in group 3 (Red) may be value engineered **or removed** from the project to meet budget
    a. DCO will provide the impact of ECMs value engineered or removed:
        i. Energy Savings
        ii. Operations and Maintenance Savings
        iii. Incentive
5. As per ESIP law DCO fee will be applied to the ECM hard cost.
    a. DCO will receive no compensation for bids that are under budget
    b. DCO will receive no penalty for bids that are over budget

Project bidding strategy is agreed upon.

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ENERGY SAVINGS PLAN

APPENDIX C

OPERATIONS AND MAINTENANCE SAVINGS

APPENDIX C – OPERATION & MAINTENANCE SAVINGS

Operations and Maintenance and other non-energy-related cost savings are allowable in NJ ESIPs, and are defined as reduction in expenses (other than energy cost savings) related to energy and water consuming equipment.

Energy-related cost savings can result from avoided expenditures for operations, maintenance, equipment repair, or equipment replacement due to the ESIP project.

Sources of O&M savings include:

- Termination of service personnel
- Lower maintenance service contract costs
- Decrease in repair costs
    - Avoided repair and replacement costs as a result of replacing old and unreliable equipment
    - Material savings due to new equipment warranties
    - Material savings due to the longer life items not needing replacement
        - In particular, reduction in florescent bulbs due to LED

Termination of service personnel

As a result of the ESIP, a number of the client's maintenance staff members may no longer be required. If there will be a reduction in the County's maintenance staff, O&M savings can be claimed.

A problem could arise if the maintenance staff is not reduced. Then it would be necessary to determine what new O&M responsibilities the facility has taken on, or savings should not be claimed. For example, it could be that a new building was constructed. During the performance period, it is important to establish that any increased maintenance was not due to the equipment installed under the ESIP.

Lower maintenance service contract costs

Prior to the implementation of the ESIP mechanical and electrical equipment was maintained by a third party under a maintenance contract. The ESPC replaces the aging equipment with newer, more efficient equipment, which can reduce the service costs to the client.

Decrease in repair costs

The client is responsible for maintenance both before and after the equipment installation. Although there is no reduction in staff for which to claim labor savings, there will be cost savings on replacement materials.

Material-related savings frequently result from lighting and lighting controls projects.

For this project, lighting maintenance savings will result from the following:

1. Reduced material requirements (e.g., lamps)
2. Reduced operating time — Control measures increase equipment life by reducing the burn time of lamps and ballasts
3. Warranty-related savings — newly installed lamps, and fixtures come with a manufacturer warranty of 10 years.

O&M Savings

1. The project contains the following Operations and Maintenance savings that the client will allocate to fund debt service. This amount was provided by the County as an estimated cost of maintaining/buying replacement bulbs and the labor cost associated with bulb replacement.

O&M SAVINGS SCHEDULE	
ECM	SAVINGS
Lighting Replacement (LED)	$38,862

Project total O&M savings to fund debt service amount $38,862 and these savings need to begin to accrue no later than 1/1/2017.

Project O&M Savings strategy is agreed upon.

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ENERGY SAVINGS PLAN

APPENDIX D

PROJECT CHANGES IN FINANCING

APPENDIX D – PROJECT CHANGES IN FINANCING

The Energy savings plan has been approved using:

Interest rate of 2.28%
Term.....20 Years
Construction Term .....1 Year
Construction Interest Only Payment of $260,799
Annual Surplus of no less than $2,000

During financing DCO will provide assistance but does not guarantee the timing of savings or incentives.

While beneficial to the client financing changes are the responsibility of the client, bond counsel and/or financial advisor. DCO represents in no way advice on these financial items

Financial items may include but are not limited to:

- Timing of payments
- Splitting payments into bi-annual, tri-annual, etc.
- Coordination with the clients fiscal year
- Local finance board material, forms and presentations
- Multiple tiered interest rates

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ENERGY SAVINGS PLAN

APPENDIX E

INCENTIVES IN DEBT SERVICE

APPENDIX E – INCENTIVES IN DEBT SERVICE

The Energy savings plan has been approved using 100% of the incentive(s) to fund debt service.

Incentives sorted by building and incentive type are listed below:

INCENTIVES SCHEDULE			
ECM	P4P INCENTIVE	D.I. INCENTIVE	CHP INCENTIVE
Court House	$71,213		
Administration Building	$48,644		
New Jail	$126,524		
Prosecutor's Office	N/A	$34,024	
Justice Complex	$166,306		$1,100,000
P.E.E.R. Building/Parking Garage	$181,972		
TOTAL	**$594,659**	**$34,024**	**$1,100,000**

No implied and/or written guarantee are being made with respective to the receipt of incentives.

Incentives estimates carry inherent risks that may jeopardize the receipt of them.

Therefore, the client acknowledges and accepts that any project proposed should not rely on the receipt of incentives as a reason to implement it.

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ENERGY SAVINGS PLAN

APPENDIX F

OPERATING CONDITIONS

APPENDIX F – OPERATING CONDITIONS

The Energy savings plan has been approved using the following operating conditions for energy savings calculations.

Room Type/Description	Winter Temperature Setpoint (ºF)	Winter Unoccupied Temperature Setpoint (ºF)	Summer Temperature Setpoint (ºF)	Summer Unoccupied Temperature Setpoint (ºF)
Academic	70	60	72	85
Office / Admin	70	60	72	85
Student Housing	70	70	72	85
Sports Related	70	60	72	85
Auditoriums	70	60	72	85
Shops	68	55	74	88
MEP Storage	65	55	75	88

Room Type/Description	Holidays	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Academic	Unocc	8am-4pm	8am-4pm	8am-4pm	8am-4pm	8am-4pm	Unocc	Unocc
Office / Admin	Unocc	8am-4pm	8am-4pm	8am-4pm	8am-4pm	8am-4pm	Unocc	Unocc
Student Housing	Unocc	Occ	Occ	Occ	Occ	Occ	Occ	Occ
Sports Related	Unocc	8am-9pm	8am-9pm	8am-9pm	8am-9pm	8am-9pm	12pm-10pm	12pm-10pm
Auditoriums	Unocc	8am-9pm	8am-9pm	8am-9pm	8am-9pm	8am-9pm	12pm-10pm	12pm-10pm
Shops	Unocc	8am-6pm	8am-6pm	8am-6pm	8am-6pm	8am-6pm	Unocc	Unocc
MEP Storage	Unocc	7am-7pm	7am-7pm	7am-7pm	7am-7pm	7am-7pm	Unocc	Unocc

Lighting Run Hours

Building Type	Equivalent Full Load Runtime hours/year, NJ Protocols
Education – Primary School	1,440
Education – Secondary School	2,305
Education – Community College	3,792
Education – University	3,073
Education – Other School	2,305
Grocery	5,824
Lodging Hotel (Guest Rooms)	1,145
Lodging Motel	8,736
Manufacturing – Light Industrial	4,290
Medical – Hospital	8,736
Medical – Clinic	4,212
Office- Large	2,808
Office-Small	2,808
Residential – Common Area	7,665
Residential – Tenant Area & Related	See below
Restaurant – Sit-Down	4,368
Restaurant – Fast-Food	6,188
Retail – 3-Story Large	4,259
Retail – Single-Story Large	4,368
Retail – Small	4,004
Storage Conditioned	4,290
Storage Heated or Unconditioned	4,290
Warehouse	3,900
Average = Miscellaneous	4,242

The Energy savings plan has been approved using the above referenced operating conditions for energy savings calculations. Any deviations to these conditions will require a remodeling of the savings and or baseline.

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ENERGY SAVINGS PLAN

APPENDIX G

LIGHTING LINE-BY-LINE

	LOCATION:			EXISTING				PROPOSED			SAVINGS				EXISTING LIGHTING CONTROL				
Line Ref	LOCATION:	Building	Print Area	Existing Hrs. per Year	Existing QTY	Existing Lighting Descriptio	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Descriptio	Proposed WATT / Fixture	KWH Saved	AC KWH Saved	KW Saved		LOCATION:	Existing Hrs. per Year	Lighting Qty	Existing Control Description	WATT / Fixture
1	304 Conf. Rn	Administration	0	3000	12	2x2 2 Lamp,	62	12	2 LAMP 2' 9\	18	1,584	0	0.528		304 Conf. Rn	3,000	12	2 LAMP 2' 9\	18
2	3RD Flr. Ele	Administration	0	4,500	4	2x4 3 Lamp,	93	4	3 LAMP 4' 1\	45	864	0	0.192		3RD Flr. Ele	4,500	4	3 LAMP 4' 1\	45
3	3rd Flr. Corri	Administration	0	4,500	9	2x4 3 Lamp,	93	9	3 LAMP 4' 1\	45	1,944	0	0.432		3rd Flr. Corri	4,500	9	3 LAMP 4' 1\	45
4	341 Manag.	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		341 Manag.	3,000	6	2 LAMP 2' 9\	18
5	341 Manag.	Administration	0	3,000	3	2x2 2 Lamp,	62	3	2 LAMP 2' 9\	18	396	0	0.132		341 Manag.	3,000	3	2 LAMP 2' 9\	18
6	340 Manag.	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9\	18	1,188	0	0.396		340 Manag.	3,000	9	2 LAMP 2' 9\	18
7	339 Copy RN	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		339 Copy RN	3,000	6	2 LAMP 2' 9\	18
8	338 LOCKED	Administration	0	3,000	2	2x2 2 Lamp,	62	2	2 LAMP 2' 9\	18	264	0	0.088		338 LOCKED	3,000	2	2 LAMP 2' 9\	18
9	337 Private-L	Administration	0	3,000	1	2x4 3 Lamp,	93	1	3 LAMP 4' 1\	45	144	0	0.048		337 Private-L	3,000	1	3 LAMP 4' 1\	45
10	335 Admin's	Administration	0	3,000	7	2x2 2 Lamp,	62	7	2 LAMP 2' 9\	18	924	0	0.308		335 Admin's	3,000	7	2 LAMP 2' 9\	18
11	335 Admin's	Administration	0	3,000	4	2x2 2 Lamp,	62	4	2 LAMP 2' 9\	18	528	0	0.176		335 Admin's	3,000	4	2 LAMP 2' 9\	18
12	334 Admin's	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		334 Admin's	3,000	6	2 LAMP 2' 9\	18
13	328 Clerk of	Administration	0	3,000	20	2x2 2 Lamp,	62	20	2 LAMP 2' 9\	18	2,640	0	0.88		328 Clerk of	3,000	20	2 LAMP 2' 9\	18
14	329 (COTB)	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		329 (COTB)	3,000	6	2 LAMP 2' 9\	18
15	329 Kit/Close	Administration	0	3,000	6	1x2 1 Lamp,	25	6	1 LAMP 2' 9\	9	288	0	0.096		329 Kit/Close	3,000	6	1 LAMP 2' 9\	9
16	330 (COTB)	Administration	0	3,000	5	2x2 2 Lamp,	62	5	2 LAMP 2' 9\	18	660	0	0.22		330 (COTB)	3,000	5	2 LAMP 2' 9\	18
17	(COTB) Vaul	Administration	0	3,000	8	2x4 2 Lamp,	62	8	2 LAMP 4' 1\	30	768	0	0.256		(COTB) Vaul	3,000	8	2 LAMP 4' 1\	30
18	Men's Restro	Administration	0	4,500	2	1x4 2 Lamp,	62	2	2 LAMP 4' 1\	30	288	0	0.064		Men's Restro	4,500	2	2 LAMP 4' 1\	30
19	Women's Re	Administration	0	4,500	2	1x4 2 Lamp,	62	2	2 LAMP 4' 1\	30	288	0	0.064		Women's Re	4,500	2	2 LAMP 4' 1\	30
20	Corridor by R	Administration	0	4,500	11	2x2 2 Lamp,	62	11	2 LAMP 2' 9\	18	2,178	0	0.484		Corridor by R	4,500	11	2 LAMP 2' 9\	18
21	316 Freehold	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		316 Freehold	3,000	6	2 LAMP 2' 9\	18
22	317 Freehold	Administration	0	3,000	9	2x2 2 Lamp,	33	9	2 LAMP 2' 9\	18	405	0	0.135		317 Freehold	3,000	9	2 LAMP 2' 9\	18
23	317 Freehold	Administration	0	3,000	1	1x2 1 Lamp,	25	1	1 LAMP 2' 9\	9	48	0	0.016		317 Freehold	3,000	1	1 LAMP 2' 9\	9
24	314 Freehold	Administration	0	3,000	8	2x2 2 Lamp,	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		314 Freehold	3,000	8	2 LAMP 2' 9\	18
25	315 Freehold	Administration	0	3,000	8	2x2 2 Lamp,	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		315 Freehold	3,000	8	2 LAMP 2' 9\	18
26	315 Freehold	Administration	0	3,000	1	1x2 1 Lamp,	25	1	1 LAMP 2' 9\	9	48	0	0.016		315 Freehold	3,000	1	1 LAMP 2' 9\	9
27	312 Freehold	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		312 Freehold	3,000	6	2 LAMP 2' 9\	18
28	313 Freehold	Administration	0	3,000	10	2x2 2 Lamp,	62	10	2 LAMP 2' 9\	18	1,320	0	0.44		313 Freehold	3,000	10	2 LAMP 2' 9\	18
29	313 Freehold	Administration	0	3,000	1	1x2 1 Lamp,	25	1	1 LAMP 2' 9\	9	48	0	0.016		313 Freehold	3,000	1	1 LAMP 2' 9\	9
30	311 Freehold	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		311 Freehold	3,000	6	2 LAMP 2' 9\	18
31	310 Freehold	Administration	0	3,000	7	2x2 2 Lamp,	62	7	2 LAMP 2' 9\	18	924	0	0.308		310 Freehold	3,000	7	2 LAMP 2' 9\	18
32	310 Freehold	Administration	0	3,000	5	6" 100w PAR	100	5	29W PAR38	29	1,065	0	0.355		310 Freehold	3,000	5	29W PAR38	29
33	310 Freehold	Administration	0	3,000	1	1x2 1 Lamp,	25	1	1 LAMP 2' 9\	9	48	0	0.016		310 Freehold	3,000	1	1 LAMP 2' 9\	9
34	308 Freehold	Administration	0	3,000	5	2x2 2 Lamp,	62	5	2 LAMP 2' 9\	18	660	0	0.22		308 Freehold	3,000	5	2 LAMP 2' 9\	18
35	309 Freehold	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		309 Freehold	3,000	6	2 LAMP 2' 9\	18
36	309 Freehold	Administration	0	3,000	1	1x2 1 Lamp,	25	1	1 LAMP 2' 9\	9	48	0	0.016		309 Freehold	3,000	1	1 LAMP 2' 9\	9
37	305 Receptio	Administration	0	3,000	10	2x2 2 Lamp,	62	10	2 LAMP 2' 9\	18	1,320	0	0.44		305 Receptio	3,000	10	2 LAMP 2' 9\	18
38	Elevator Hall	Administration	0	4,500	3	2x2 2 Lamp,	62	3	2 LAMP 2' 9\	18	594	0	0.132		Elevator Hall	4,500	3	2 LAMP 2' 9\	18
39	Utility Closet	Administration	0	2,000	1	1x4 2 Lamp,	62	1	2 LAMP 4' 1\	30	64	0	0.032		Utility Closet	2,000	1	2 LAMP 4' 1\	30
40	Elevator	Administration	0	8,760	6	4" 45w BR20	45	6	10W BR20 L	10	1,840	0	0.21		Elevator	8,760	6	10W BR20 L	10
41	Not An Exit P	Administration	0	2,000	0	Jan-00	0	0		0	0	0	0		Not An Exit P	2,000	0	Jan-00	0
42	Men's Restro	Administration	0	4,500	1	1x3 2 Lamp,	79	1	2 LAMP 3' 1\	24	248	0	0.055		Men's Restro	4,500	1	2 LAMP 3' 1\	24
43	Women's Re	Administration	0	4,500	1	1x3 2 Lamp,	79	1	2 LAMP 3' 1\	24	248	0	0.055		Women's Re	4,500	1	2 LAMP 3' 1\	24
44	319 Break R	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		319 Break R	3,000	6	2 LAMP 2' 9\	18
45	318 Copy RN	Administration	0	3,000	4	2x2 2 Lamp,	62	4	2 LAMP 2' 9\	18	528	0	0.176		318 Copy RN	3,000	4	2 LAMP 2' 9\	18
46	South Stairca	Administration	0	8,760	5	2x4 4 Lamp,	114	5	4 LAMP 4' 1\	60	2,365	0	0.27		South Stairca	8,760	5	4 LAMP 4' 1\	60
47	South Stairca	Administration	0	8,760	3	2x4 2 Lamp,	62	3	2 LAMP 4' 1\	30	841	0	0.096		South Stairca	8,760	3	2 LAMP 4' 1\	30
48	2ND Flr. Ele	Administration	0	4,500	2	2x4 3 Lamp,	93	2	3 LAMP 4' 1\	45	432	0	0.096		2ND Flr. Ele	4,500	2	3 LAMP 4' 1\	45
49	2ND Flr. Cor	Administration	0	4,500	9	2x4 3 Lamp,	93	9	3 LAMP 4' 1\	45	1,944	0	0.432		2ND Flr. Cor	4,500	9	3 LAMP 4' 1\	45
50	203 Employe	Administration	0	3,000	18	2x4 3 Lamp,	93	18	3 LAMP 4' 1\	45	2,592	0	0.864		203 Employe	3,000	18	3 LAMP 4' 1\	45
51	203 Employe	Administration	0	3,000	4	2x4 3 Lamp,	93	4	3 LAMP 4' 1\	45	576	0	0.192		203 Employe	3,000	4	3 LAMP 4' 1\	45
52	203 Employe	Administration	0	3,000	3	2x4 3 Lamp,	93	3	3 LAMP 4' 1\	45	432	0	0.144		203 Employe	3,000	3	3 LAMP 4' 1\	45
53	203-13 Conf	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		203-13 Conf	3,000	6	2 LAMP 2' 9\	18
54	225 Risk Ma	Administration	0	3,000	9	2x4 3 Lamp,	93	9	3 LAMP 4' 1\	45	1,296	0	0.432		225 Risk Ma	3,000	9	3 LAMP 4' 1\	45
55	225 Risk Ma	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		225 Risk Ma	3,000	6	2 LAMP 2' 9\	18
56	225 Risk Ma	Administration	0	3,000	2	2x4 3 Lamp,	93	2	3 LAMP 4' 1\	45	288	0	0.096		225 Risk Ma	3,000	2	3 LAMP 4' 1\	45
57	225 Risk Ma	Administration	0	3,000	2	2x4 3 Lamp,	93	2	3 LAMP 4' 1\	45	288	0	0.096		225 Risk Ma	3,000	2	3 LAMP 4' 1\	45
58	224 Copy RN	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		224 Copy RN	3,000	6	2 LAMP 2' 9\	18
59	224 Purchas	Administration	0	3,000	23	2x2 2 Lamp,	62	23	2 LAMP 2' 9\	18	3,036	0	1.012		224 Purchas	3,000	23	2 LAMP 2' 9\	18
60	224 Back RN	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		224 Back RN	3,000	6	2 LAMP 2' 9\	18
61	224 Office ne	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9\	18	792	0	0.264		224 Office ne	3,000	6	2 LAMP 2' 9\	18
62	224 Back Off	Administration	0	3,000	2	2x2 2 Lamp,	62	2	2 LAMP 2' 9\	18	264	0	0.088		224 Back Off	3,000	2	2 LAMP 2' 9\	18
63	224 Back Off	Administration	0	3,000	8	2x4 3 Lamp,	93	8	3 LAMP 4' 1\	45	1,152	0	0.384		224 Back Off	3,000	8	3 LAMP 4' 1\	45
64	224 Back Off	Administration	0	3,000	10	2x4 3 Lamp,	93	10	3 LAMP 4' 1\	45	1,440	0	0.48		224 Back Off	3,000	10	3 LAMP 4' 1\	45
65	224 Back Off	Administration	0	3,000	8	2x4 2 Lamp,	62	8	2 LAMP 4' 1\	30	768	0	0.256		224 Back Off	3,000	8	2 LAMP 4' 1\	30
66	224 Payroll C	Administration	0	3,000	6	2x4 3 Lamp,	93	6	3 LAMP 4' 1\	45	864	0	0.288		224 Payroll C	3,000	6	3 LAMP 4' 1\	45
67	224 Finance	Administration	0	3,000	24	2x4 3 Lamp,	93	24	3 LAMP 4' 1\	45	3,456	0	1.152		224 Finance	3,000	24	3 LAMP 4' 1\	45
68	224 Finance	Administration	0	3,000	5	6" 13w 2 DT	26	5	2 LAMP 13W	26	0	0	0		224 Finance	3,000	5	6" 13w 2 DT	26
69	224 Payroll C	Administration	0	3,000	2	2x4 3 Lamp,	93	2	3 LAMP 4' 1\	45	288	0	0.096		224 Payroll C	3,000	2	3 LAMP 4' 1\	45
70	224 Payroll C	Administration	0	3,000	2	2x4 3 Lamp,	93	2	3 LAMP 4' 1\	45	288	0	0.096		224 Payroll C	3,000	2	3 LAMP 4' 1\	45
71	224 Payroll C	Administration	0	3,000	3	2x4 3 Lamp,	93	3	3 LAMP 4' 1\	45	432	0	0.144		224 Payroll C	3,000	3	3 LAMP 4' 1\	45
72	224 Payroll C	Administration	0	3,000	5	2x4 3 Lamp,	93	5	3 LAMP 4' 1\	45	720	0	0.24		224 Payroll C	3,000	5	3 LAMP 4' 1\	45
73	Payroll Hallw	Administration	0	4,500	2	2x4 3 Lamp,	93	2	3 LAMP 4' 1\	45	432	0	0.096		Payroll Hallw	4,500	2	3 LAMP 4' 1\	45
74	218 LOCKED	Administration	0	3,000	1	1x4 2 Lamp,	62	1	2 LAMP 4' 1\	30	96	0	0.032		218 LOCKED	3,000	1	2 LAMP 4' 1\	30
75	218 Employe	Administration	0	3,000	11	2x4 3 Lamp,	93	11	3 LAMP 4' 1\	45	1,584	0	0.528		218 Employe	3,000	11	3 LAMP 4' 1\	45
76	218 Office	Administration	0	3,000	4	2x4 3 Lamp,	93	4	3 LAMP 4' 1\	45	576	0	0.192		218 Office	3,000	4	3 LAMP 4' 1\	45
77	218 Office	Administration	0	3,000	6	2x4 3 Lamp,	93	6	3 LAMP 4' 1\	45	864	0	0.288		218 Office	3,000	6	3 LAMP 4' 1\	45
78	1st Flr. Main	Administration	0	4,500	21	2x4 3 Lamp,	93	21	3 LAMP 4' 1\	45	4,536	0	1.008		1st Flr. Main	4,500	21	3 LAMP 4' 1\	45
79	1st Flr. Main	Administration	0	4,500	6	2x4 3 Lamp,	93	6	3 LAMP 4' 1\	45	1,296	0	0.288		1st Flr. Main	4,500	6	3 LAMP 4' 1\	45

80	115 Telephor	Administration	0	3,000	3	2x4 3 Lamp,	93	3	3 LAMP 4' 1	45	432	0	0.144		115 Telephor	3,000	3	3 LAMP 4' 1	45
81	119 Freehold	Administration	0	3,000	42	2x2 2 Lamp,	62	42	2 LAMP 2' 9	18	5,544	0	1.848		119 Freehold	3,000	42	2 LAMP 2' 9	18
82	117 Conferer	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	1,188	0	0.396		117 Conferer	3,000	9	2 LAMP 2' 9	18
83	109 Bus & T	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	1,188	0	0.396		109 Bus & T	3,000	9	2 LAMP 2' 9	18
84	108 Bus & T	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	1,188	0	0.396		108 Bus & T	3,000	9	2 LAMP 2' 9	18
85	109 Bus & T	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		109 Bus & T	3,000	6	2 LAMP 2' 9	18
86	109 Bus & T	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	1,188	0	0.396		109 Bus & T	3,000	9	2 LAMP 2' 9	18
87	109 Bus & T	Administration	0	4,500	3	2x2 2 Lamp,	62	3	2 LAMP 2' 9	18	594	0	0.132		109 Bus & T	4,500	3	2 LAMP 2' 9	18
88	107 Public R	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	1,188	0	0.396		107 Public R	3,000	9	2 LAMP 2' 9	18
89	107 Public R	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		107 Public R	3,000	6	2 LAMP 2' 9	18
90	131 Receptic	Administration	0	4,500	13	2x2 2 Lamp,	62	13	2 LAMP 2' 9	18	2,574	0	0.572		131 Receptic	4,500	13	2 LAMP 2' 9	18
91	131 Office 1	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		131 Office 1	3,000	6	2 LAMP 2' 9	18
92	131 Office 2	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		131 Office 2	3,000	6	2 LAMP 2' 9	18
93	131 Office 3	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		131 Office 3	3,000	6	2 LAMP 2' 9	18
94	131 Office C	Administration	0	3,000	8	2x2 2 Lamp,	62	8	2 LAMP 2' 9	18	1,056	0	0.352		131 Office C	3,000	8	2 LAMP 2' 9	18
95	131 Conferer	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		131 Conferer	3,000	6	2 LAMP 2' 9	18
96	131 Big Offic	Administration	0	3,000	18	2x2 2 Lamp,	62	18	2 LAMP 2' 9	18	2,376	0	0.792		131 Big Offic	3,000	18	2 LAMP 2' 9	18
97	130 Office 6	Administration	0	3,000	24	2x2 2 Lamp,	62	24	2 LAMP 2' 9	18	3,168	0	1.056		130 Office 6	3,000	24	2 LAMP 2' 9	18
98	Men's Restro	Administration	0	4,500	2	1x4 2 Lamp,	62	2	2 LAMP 4' 1	30	288	0	0.064		Men's Restro	4,500	2	2 LAMP 4' 1	30
99	Women's Re	Administration	0	4,500	2	1x4 2 Lamp,	62	2	2 LAMP 4' 1	30	288	0	0.064		Women's Re	4,500	2	2 LAMP 4' 1	30
100	Room next to	Administration	0	3,000	1	2x2 2 Lamp,	62	1	2 LAMP 2' 9	18	132	0	0.044		Room next to	3,000	1	2 LAMP 2' 9	18
101	Utility Closet	Administration	0	2,000	2	1x4 2 Lamp,	62	2	2 LAMP 4' 1	30	128	0	0.064		Utility Closet	2,000	2	2 LAMP 4' 1	30
102	Freeholders	Administration	0	3,000	8	2x2 2 Lamp,	62	8	2 LAMP 2' 9	18	1,056	0	0.352		Freeholders	3,000	8	2 LAMP 2' 9	18
103	Training RM	Administration	0	3,000	16	2x2 2 Lamp,	62	16	2 LAMP 2' 9	18	2,112	0	0.704		Training RM	3,000	16	2 LAMP 2' 9	18
104	9 Lunch RM	Administration	0	3,000	8	2x4 3 Lamp,	93	8	3 LAMP 4' 1	45	1,152	0	0.384		9 Lunch RM	3,000	8	3 LAMP 4' 1	45
105	Men's Restro	Administration	0	4,500	2	1x4 2 Lamp,	62	2	2 LAMP 4' 1	30	288	0	0.064		Men's Restro	4,500	2	2 LAMP 4' 1	30
106	8 Room	Administration	0	2,600	3	2x2 2 Lamp,	62	3	2 LAMP 2' 9	18	343	0	0.132		8 Room	2,600	3	2 LAMP 2' 9	18
107	7 Room	Administration	0	2,600	15	2x2 2 Lamp,	62	15	2 LAMP 2' 9	18	1,716	0	0.66		7 Room	2,600	15	2 LAMP 2' 9	18
108	RM 5/6 Hallv	Administration	0	4,500	1	2x2 2 Lamp,	62	1	2 LAMP 2' 9	18	198	0	0.044		RM 5/6 Hallv	4,500	1	2 LAMP 2' 9	18
109	5 Room - LO	Administration	0	2,600	4	1x4 2 Lamp,	62	4	2 LAMP 4' 1	30	333	0	0.128		5 Room - LO	2,600	4	2 LAMP 4' 1	30
110	6 Room - LO	Administration	0	2,600	4	1x4 2 Lamp,	62	4	2 LAMP 4' 1	30	333	0	0.128		6 Room - LO	2,600	4	2 LAMP 4' 1	30
111	25 IT Server	Administration	0	3,000	13	2x2 2 Lamp,	62	13	2 LAMP 2' 9	18	1,716	0	0.572		25 IT Server	3,000	13	2 LAMP 2' 9	18
112	25 IT Server	Administration	0	3,000	12	2x4 4 Lamp,	114	12	4 LAMP 4' 1	60	1,944	0	0.648		25 IT Server	3,000	12	4 LAMP 4' 1	60
113	25 IT Server	Administration	0	3,000	8	1x4 2 Lamp,	62	8	2 LAMP 4' 1	30	768	0	0.256		25 IT Server	3,000	8	2 LAMP 4' 1	30
114	Basement H	Administration	0	4,500	12	2x4 3 Lamp,	93	12	3 LAMP 4' 1	45	2,592	0	0.576		Basement H	4,500	12	3 LAMP 4' 1	45
115	Basement Ha	Administration	0	800	2	2x2 2 Lamp,	62	2	2 LAMP 2' 9	18	70	0	0.088		Basement Ha	800	2	2 LAMP 2' 9	18
116	B&G Storage	Administration	0	2,000	9	2x4 3 Lamp,	93	9	3 LAMP 4' 1	45	864	0	0.432		B&G Storage	2,000	9	3 LAMP 4' 1	45
117	B&G Storage	Administration	0	4,500	5	2x2 2 Lamp,	62	5	2 LAMP 2' 9	18	990	0	0.22		B&G Storage	4,500	5	2 LAMP 2' 9	18
118	B&G Storage	Administration	0	4,500	1	1x4 2 Lamp,	62	1	2 LAMP 4' 1	30	144	0	0.032		B&G Storage	4,500	1	2 LAMP 4' 1	30
119	Pump Room	Administration	0	2,000	1	1x4 2 Lamp,	62	1	2 LAMP 4' 1	30	64	0	0.032		Pump Room	2,000	1	2 LAMP 4' 1	30
120	16 Mechanic	Administration	0	2,000	8	1x4 2 Lamp,	62	8	2 LAMP 4' 1	30	512	0	0.256		16 Mechanic	2,000	8	2 LAMP 4' 1	30
121	16 Mechanic	Administration	0	2,000	4	1x4 3 Lamp,	93	4	2 LAMP 4' 1	30	504	0	0.252		16 Mechanic	2,000	4	2 LAMP 4' 1	30
122	Back Mechar	Administration	0	2,000	9	1x4 2 Lamp,	62	9	2 LAMP 4' 1	30	576	0	0.288		Back Mechar	2,000	9	2 LAMP 4' 1	30
123	Back Mechar	Administration	0	2,000	2	1x4 3 Lamp,	93	2	2 LAMP 4' 1	30	252	0	0.126		Back Mechar	2,000	2	2 LAMP 4' 1	30
124	Back Mechar	Administration	0	4,500	2	1x4 2 Lamp,	70	2	2 LAMP 4' 1	30	360	0	0.08		Back Mechar	4,500	2	2 LAMP 4' 1	30
125	Utility Stairs	Administration	0	8,760	2	2x4 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		Utility Stairs	8,760	2	2 LAMP 4' 1	30
126	Room 11/12	Administration	0	4,500	2	2x2 2 Lamp,	62	2	2 LAMP 2' 9	18	396	0	0.088		Room 11/12	4,500	2	2 LAMP 2' 9	18
127	Room 11/12	Administration	0	2,000	6	2x4 2 Lamp,	62	6	2 LAMP 4' 1	30	384	0	0.192		Room 11/12	2,000	6	2 LAMP 4' 1	30
128	Room 11/12	Administration	0	2,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	792	0	0.396		Room 11/12	2,000	9	2 LAMP 2' 9	18
129	Room 11/12	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		Room 11/12	3,000	6	2 LAMP 2' 9	18
130	Office #6	Administration	0	3,000	9	2x2 2 Lamp,	62	9	2 LAMP 2' 9	18	1,188	0	0.396		Office #6	3,000	9	2 LAMP 2' 9	18
131	Office #8	Administration	0	3,000	6	2x2 2 Lamp,	62	6	2 LAMP 2' 9	18	792	0	0.264		Office #8	3,000	6	2 LAMP 2' 9	18
132	North Stairca	Administration	0	8,760	5	2x4 4 Lamp,	114	5	4 LAMP 4' 1	60	2,365	0	0.27		North Stairca	8,760	5	4 LAMP 4' 1	60
133	North Stairca	Administration	0	8,760	2	2x4 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		North Stairca	8,760	2	2 LAMP 4' 1	30
134	Penthouse E	Administration	0	2,000	4	1x4 2 Lamp,	62	4	2 LAMP 4' 1	30	256	0	0.128		Penthouse E	2,000	4	2 LAMP 4' 1	30
135	Jan-00	Administration	0	2,000	2	1x4 3 Lamp,	93	2	2 LAMP 4' 1	30	252	0	0.126		0	2,000	2	2 LAMP 4' 1	30
136	Penthouse M	Administration	0	2,000	12	1x4 2 Lamp,	62	12	2 LAMP 4' 1	30	768	0	0.384		Penthouse M	2,000	12	2 LAMP 4' 1	30
137	Jan-00	Administration	0	2,000	4	1x4 3 Lamp,	93	4	2 LAMP 4' 1	30	504	0	0.252		0	2,000	4	2 LAMP 4' 1	30
138	North Side E	Administration	0	4,000	1	1-Lamp 13w	13	1	1 LAMP 13W	13	0	0	0		North Side E	4,000	1	1-Lamp 13w	13
139	South Side E	Administration	0	4,000	1	1-Lamp 13w	13	1	1 LAMP 13W	13	0	0	0		South Side E	4,000	1	1-Lamp 13w	13
140	Back Area	Administration	0	4,000	1	1-Lamp 13w	13	1	1 LAMP 13W	13	0	0	0		Back Area	4,000	1	1-Lamp 13w	13
141	Back Area	Administration	0	4,000	1	70w HID Wa	92	1	12W LED R8	12	320	0	0.08		Back Area	4,000	1	12W LED R8	12
142	Back Area	Administration	0	4,000	1	70w HID Wa	92	1	12W LED R8	12	320	0	0.08		Back Area	4,000	1	12W LED R8	12
143	Back Area	Administration	0	4,000	1	1-Lamp 13w	13	1	1 LAMP 13W	13	0	0	0		Back Area	4,000	1	1-Lamp 13w	13
	Formula Line	Jan-00	0		0	Jan-00	0	0		0	0	0	0		Formula Line		0	Jan-00	0
end	insert above this line				0	Jan-00	0	0		0	0		0		insert above		0	Jan-00	0
	Original Estimate Totals: Administration Building							**901**			**127,156**	**0**	**39**		**Original Estimate Totals:**	**901**			
	Courthouse														**Courthouse**				
1	143A - 1st F	Courthouse	0	2,600	25	2-Lamp T8-U	62	25	2 LAMP 2' 9	18	2,860	0	1.1		143A - 1st F	2,600	25	2 LAMP 2' 9	18
2	143B - Office	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9	18	686	0	0.264		143B - Office	2,600	6	2 LAMP 2' 9	18
3	143C - Bathr	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		143C - Bathr	2,600	1	2 LAMP 2' 9	18
4	143D - Bathr	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		143D - Bathr	2,600	1	2 LAMP 2' 9	18
5	145A - Judge	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9	18	458	0	0.176		145A - Judge	2,600	4	2 LAMP 2' 9	18
6	145A - Judge	Courthouse	0	2,600	2	2-Lamp CFL	42	2	2 LAMP 11W	22	104	0	0.04		145A - Judge	2,600	2	2 LAMP 11W	22
7	Back Offices	Courthouse	0	2,600	3	3-Lamp T8 F	93	3	3 LAMP 4' 1	45	374	0	0.144		Back Offices	2,600	3	3 LAMP 4' 1	45
8	Back Offices	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		Back Offices	2,600	1	2 LAMP 2' 9	18
9	Back Offices	Courthouse	0	2,600	1	2-Lamp CFL	42	1	2 LAMP 11W	22	52	0	0.02		Back Offices	2,600	1	2 LAMP 11W	22
10	142 - Courtro	Courthouse	0	2,600	20	2-Lamp T8-U	62	20	2 LAMP 2' 9	18	2,288	0	0.88		142 - Courtro	2,600	20	2 LAMP 2' 9	18
11	142 - Courtro	Courthouse	0	2,600	6	2-Lamp CFL	42	6	2 LAMP 11W	22	312	0	0.12		142 - Courtro	2,600	6	2 LAMP 11W	22
12	142A	Courthouse	0	2,600	3	3-Lamp T8 F	93	3	3 LAMP 4' 1	45	374	0	0.144		142A	2,600	3	3 LAMP 4' 1	45
13	142B	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		142B	2,600	1	2 LAMP 2' 9	18
14	141 - Office	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	229	0	0.088		141 - Office	2,600	2	2 LAMP 2' 9	18
15	141 - Office	Courthouse	0	2,600	5	2-Lamp CFL	42	5	2 LAMP 11W	22	260	0	0.1		141 - Office	2,600	5	2 LAMP 11W	22
16	141B - Judge	Courthouse	0	2,600	5	2-Lamp T8-U	62	5	2 LAMP 2' 9	18	572	0	0.22		141B - Judge	2,600	5	2 LAMP 2' 9	18

17	141B - Judge	Courthouse	0	2,600	6	2-Lamp CFL	42	6	2 LAMP 11W	22	312	0	0.12		141B - Judge	2,600	6	2 LAMP 11W	22
18	141B - Judge	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9\	18	114	0	0.044		141B - Judge	2,600	1	2 LAMP 2' 9\	18
19	141A - Office	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 15	45	250	0	0.096		141A - Office	2,600	2	3 LAMP 4' 15	45
20	129 - Court R	Courthouse	0	2,600	20	2-Lamp T8-U	62	20	2 LAMP 2' 9\	18	2,288	0	0.88		129 - Court R	2,600	20	2 LAMP 2' 9\	18
21	Office	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 15	45	250	0	0.096		Office	2,600	2	3 LAMP 4' 15	45
22	132 - Office	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		132 - Office	2,600	6	2 LAMP 2' 9\	18
23	Judge Office	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		Judge Office	2,600	4	2 LAMP 2' 9\	18
24	Judge Office	Courthouse	0	2,600	6	2-Lamp CFL	42	6	2 LAMP 11W	22	312	0	0.12		Judge Office	2,600	6	2 LAMP 11W	22
25	Court Room	Courthouse	0	2,600	28	2-Lamp T8-U	62	28	2 LAMP 2' 9\	18	3,203	0	1.232		Court Room	2,600	28	2 LAMP 2' 9\	18
26	127 - Office	Courthouse	0	2,600	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,030	0	0.396		127 - Office	2,600	9	2 LAMP 2' 9\	18
27	127 - Office	Courthouse	0	2,600	1	2-Lamp T8 2	33	1	2 LAMP 2' 9\	18	39	0	0.015		127 - Office	2,600	1	2 LAMP 2' 9\	18
28	Bathrooms	Courthouse	0	2,600	2	1-Lamp T8 4	32	2	1 LAMP 4' 15	15	88	0	0.034		Bathrooms	2,600	2	1 LAMP 4' 15	15
29	130 - Judge	Courthouse	0	2,600	10	2-Lamp T8-U	62	10	2 LAMP 2' 9\	18	1,144	0	0.44		130 - Judge	2,600	10	2 LAMP 2' 9\	18
30	130 - Judge	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		130 - Judge	2,600	6	2 LAMP 2' 9\	18
31	130 - Judge	Courthouse	0	2,600	1	2-Lamp CFL	64	1	2 LAMP 11W	22	109	0	0.042		130 - Judge	2,600	1	2 LAMP 11W	22
32	137 - Office	Courthouse	0	2,600	6	3-Lamp T8 F	93	6	3 LAMP 4' 15	45	749	0	0.288		137 - Office	2,600	6	3 LAMP 4' 15	45
33	Security Entr	Courthouse	0	3,000	12	3-Lamp T8 F	93	12	3 LAMP 4' 15	45	1,728	0	0.576		Security Entr	3,000	12	3 LAMP 4' 15	45
34	Security Entr	Courthouse	0	3,000	8	3-Lamp T8 F	93	8	3 LAMP 4' 15	45	1,152	0	0.384		Security Entr	3,000	8	3 LAMP 4' 15	45
35	151A - Hallw	Courthouse	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		151A - Hallw	3,000	8	2 LAMP 2' 9\	18
36	152 - Office	Courthouse	0	2,600	4	3-Lamp T8 F	93	4	3 LAMP 4' 15	45	499	0	0.192		152 - Office	2,600	4	3 LAMP 4' 15	45
37	153 - Office	Courthouse	0	2,600	3	3-Lamp T8 F	93	3	3 LAMP 4' 15	45	374	0	0.144		153 - Office	2,600	3	3 LAMP 4' 15	45
38	Jun-00	Courthouse	0	2,600	4	3-Lamp T8 F	93	4	3 LAMP 4' 15	45	499	0	0.192		155	2,600	4	3 LAMP 4' 15	45
39	154 - Office	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 15	45	250	0	0.096		154 - Office	2,600	2	3 LAMP 4' 15	45
40	101A - Secur	Courthouse	0	3,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,188	0	0.396		101A - Secur	3,000	9	2 LAMP 2' 9\	18
41	101A - Secur	Courthouse	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	264	0	0.088		101A - Secur	3,000	2	2 LAMP 2' 9\	18
42	150 - Sheriff'	Courthouse	0	2,600	1	3-Lamp T8 F	93	1	3 LAMP 4' 15	45	125	0	0.048		150 - Sheriff'	2,600	1	3 LAMP 4' 15	45
43	150 - Sheriff'	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9\	18	114	0	0.044		150 - Sheriff'	2,600	1	2 LAMP 2' 9\	18
44	252 - Judge	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		252 - Judge	2,600	6	2 LAMP 2' 9\	18
45	241 - Judge	Courthouse	0	2,600	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	343	0	0.132		241 - Judge	2,600	3	2 LAMP 2' 9\	18
46	241 - Judge	Courthouse	0	2,600	1	4-Lamp T8 F	114	1	4 LAMP 4' 15	60	140	0	0.054		241 - Judge	2,600	1	4 LAMP 4' 15	60
47	241 - Judge	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		241 - Judge	2,600	6	2 LAMP 2' 9\	18
48	247 - Court R	Courthouse	0	2,600	28	2-Lamp 4' T8	62	28	2 LAMP 4' 15	30	2,330	0	0.896		247 - Court R	2,600	28	2 LAMP 4' 15	30
49	247 - Court R	Courthouse	0	2,600	6	2-Lamp 4' T8	62	6	2 LAMP 4' 15	30	499	0	0.192		247 - Court R	2,600	6	2 LAMP 4' 15	30
50	247 - Court R	Courthouse	0	2,600	1	1-Lamp CFL	21	1	18W A21 LE	18	8	0	0.003		247 - Court R	2,600	1	18W A21 LE	18
51	247 - Court R	Courthouse	0	2,600	1	1-Lamp CFL	21	1	18W A21 LE	18	8	0	0.003		247 - Court R	2,600	1	18W A21 LE	18
52	245 - Court R	Courthouse	0	2,600	28	2-Lamp 4' T8	62	28	2 LAMP 4' 15	30	2,330	0	0.896		245 - Court R	2,600	28	2 LAMP 4' 15	30
53	241 - Judge	Courthouse	0	2,600	12	2-Lamp T8-U	62	12	2 LAMP 2' 9\	18	1,373	0	0.528		241 - Judge	2,600	12	2 LAMP 2' 9\	18
54	241 - Judge	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 15	45	250	0	0.096		241 - Judge	2,600	2	3 LAMP 4' 15	45
55	240D - Office	Courthouse	0	2,600	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	343	0	0.132		240D - Office	2,600	3	2 LAMP 2' 9\	18
56	300 - Judge	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		300 - Judge	2,600	6	2 LAMP 2' 9\	18
57	300 - Judge	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		300 - Judge	2,600	2	2 LAMP 2' 9\	18
58	300 - Judge	Courthouse	0	2,600	1	1-Lamp CFL	21	1	18W A21 LE	18	8	0	0.003		300 - Judge	2,600	1	18W A21 LE	18
59	310 - Office	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		310 - Office	2,600	6	2 LAMP 2' 9\	18
60	310 - Office	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		310 - Office	2,600	6	2 LAMP 2' 9\	18
61	309 - Office	Courthouse	0	2,600	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	343	0	0.132		309 - Office	2,600	3	2 LAMP 2' 9\	18
62	Court Room	Courthouse	0	2,600	28	2-Lamp 4' T8	62	28	2 LAMP 4' 15	30	2,330	0	0.896		Court Room	2,600	28	2 LAMP 4' 15	30
63	303 - Court R	Courthouse	0	2,600	28	2-Lamp 4' T8	62	28	2 LAMP 4' 15	30	2,330	0	0.896		303 - Court R	2,600	28	2 LAMP 4' 15	30
64	309 - Judge	Courthouse	0	2,600	12	2-Lamp T8-U	62	12	2 LAMP 2' 9\	18	1,373	0	0.528		309 - Judge	2,600	12	2 LAMP 2' 9\	18
65	Judge Vincer	Courthouse	0	2,600	18	1-Lamp CFL	21	18	1 LAMP 13W	13	374	0	0.144		Judge Vincer	2,600	18	1 LAMP 13W	13
66	Historic Cour	Courthouse	0	2,600	4	15-Lamp Cha	375	4	5W LED TOI	5	3,848	0	1.48		Historic Cour	2,600	4	5W LED TOI	5
67	Historic Cour	Courthouse	0	2,600	12	1-Lamp Wall	25	12	5W LED TOI	5	624	0	0.24		Historic Cour	2,600	12	5W LED TOI	5
68	Historic Cour	Courthouse	0	2,600	27	1-Lamp Rece	21	27	16W A21 LE	16	351	0	0.135		Historic Cour	2,600	27	16W A21 LE	16
69	Historic Cour	Courthouse	0	2,600	4	1-Lamp MH \	92	4	29W PAR38	29	655	0	0.252		Historic Cour	2,600	4	29W PAR38	29
70	Historic Cour	Courthouse	0	2,600	1	4-Lamp T8 F	114	1	4 LAMP 4' 15	60	140	0	0.054		Historic Cour	2,600	1	4 LAMP 4' 15	60
71	Historic Cour	Courthouse	0	2,600	4	1-Lamp CFL	21	4	1 LAMP 13W	13	83	0	0.032		Historic Cour	2,600	4	1 LAMP 13W	13
72	Historic Cour	Courthouse	0	2,600	1	1-Lamp T12	46	1	1 LAMP 4' 15	15	81	0	0.031		Historic Cour	2,600	1	1 LAMP 4' 15	15
73	Judge Cham	Courthouse	0	2,600	12	1-Lamp CFL	21	12	1 LAMP 13W	13	250	0	0.096		Judge Cham	2,600	12	1 LAMP 13W	13
74	Judge Cham	Courthouse	0	2,600	6	2-Lamp T12	88	6	2 LAMP 4' 15	30	905	0	0.348		Judge Cham	2,600	6	2 LAMP 4' 15	30
75	Historic Cour	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 15	60	1,206	0	0.464		Historic Cour	2,600	4	4 LAMP 4' 15	60
76	West Wing L	Courthouse	0	3,000	4	1-Lamp CFL	21	4	1 LAMP 13W	13	96	0	0.032		West Wing L	3,000	4	1 LAMP 13W	13
77	225 - Office	Courthouse	0	2,600	2	2-Lamp T12	88	2	2 LAMP 4' 15	30	302	0	0.116		225 - Office	2,600	2	2 LAMP 4' 15	30
78	200 - Office	Courthouse	0	2,600	2	4-Lamp 8' T8	320	2	4 LAMP 4' 15	60	1,352	0	0.52		200 - Office	2,600	2	4 LAMP 4' 15	60
79	201 - Office	Courthouse	0	2,600	2	4-Lamp 8' T8	320	2	4 LAMP 4' 15	60	1,352	0	0.52		201 - Office	2,600	2	4 LAMP 4' 15	60
80	202 - Office	Courthouse	0	2,600	2	4-Lamp 8' T8	320	2	4 LAMP 4' 15	60	1,352	0	0.52		202 - Office	2,600	2	4 LAMP 4' 15	60
81	202 - Office	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 15	30	83	0	0.032		202 - Office	2,600	1	2 LAMP 4' 15	30
82	203 - Office	Courthouse	0	2,600	12	2-Lamp T12	88	12	2 LAMP 4' 15	30	1,810	0	0.696		203 - Office	2,600	12	2 LAMP 4' 15	30
83	215 - Office	Courthouse	0	2,600	3	4-Lamp T8 F	114	3	4 LAMP 4' 15	60	421	0	0.162		215 - Office	2,600	3	4 LAMP 4' 15	60
84	205 - Storag	Courthouse	0	2,600	2	4-Lamp T8 F	114	2	4 LAMP 4' 15	60	281	0	0.108		205 - Storag	2,600	2	4 LAMP 4' 15	60
85	222 - Office	Courthouse	0	2,600	3	4-Lamp T8 F	114	3	4 LAMP 4' 15	60	421	0	0.162		222 - Office	2,600	3	4 LAMP 4' 15	60
86	223 - Office	Courthouse	0	2,600	6	4-Lamp T12	176	6	4 LAMP 4' 15	60	1,810	0	0.696		223 - Office	2,600	6	4 LAMP 4' 15	60
87	224 - Board	Courthouse	0	2,600	3	2-Lamp T8 F	62	3	2 LAMP 4' 15	30	250	0	0.096		224 - Board	2,600	3	2 LAMP 4' 15	30
88	Surrogaate J	Courthouse	0	2,600	7	1-Lamp CFL	21	7	1 LAMP 13W	13	146	0	0.056		Surrogaate J	2,600	7	1 LAMP 13W	13
89	216 - Office	Courthouse	0	2,600	40	4-Lamp T12	176	40	4 LAMP 4' 15	60	12,064	0	4.64		216 - Office	2,600	40	4 LAMP 4' 15	60
90	217 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 15	60	1,206	0	0.464		217 - Office	2,600	4	4 LAMP 4' 15	60
91	Men's Toilet	Courthouse	0	2,600	2	2-Lamp T12	88	2	2 LAMP 4' 15	30	302	0	0.116		Men's Toilet	2,600	2	2 LAMP 4' 15	30
92	212A - Office	Courthouse	0	2,600	3	4-Lamp T8 F	114	3	4 LAMP 4' 15	60	421	0	0.162		212A - Office	2,600	3	4 LAMP 4' 15	60
93	212A - Office	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 15	30	83	0	0.032		212A - Office	2,600	1	2 LAMP 4' 15	30
94	212A - Office	Courthouse	0	2,600	4	4-Lamp T8 F	114	4	4 LAMP 4' 15	60	562	0	0.216		212A - Office	2,600	4	4 LAMP 4' 15	60
95	212A - Office	Courthouse	0	2,600	1	3-Lamp CFL	86	1	3 LAMP 4' 15	45	107	0	0.041		212A - Office	2,600	1	3 LAMP 4' 15	45
96	212A - Office	Courthouse	0	2,600	1	1-Lamp T12	42	1	1 LAMP 4' 15	15	70	0	0.027		212A - Office	2,600	1	1 LAMP 4' 15	15
97	211 - Offices	Courthouse	0	2,600	14	2-Lamp T8-U	62	14	2 LAMP 2' 9\	18	1,602	0	0.616		211 - Offices	2,600	14	2 LAMP 2' 9\	18
98	Court Room	Courthouse	0	2,600	32	2-Lamp T8-U	62	32	2 LAMP 2' 9\	18	3,661	0	1.408		Court Room	2,600	32	2 LAMP 2' 9\	18
99	Judge Peters	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		Judge Peters	2,600	6	2 LAMP 2' 9\	18
100	Judge Peters	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		Judge Peters	2,600	2	2 LAMP 2' 9\	18

101	Judge Peters	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		Judge Peters	2,600	4	2 LAMP 2' 9\	18
102	Judge Peters	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9\	18	114	0	0.044		Judge Peters	2,600	1	2 LAMP 2' 9\	18
103	Judge Office	Courthouse	0	2,600	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	915	0	0.352		Judge Office	2,600	8	2 LAMP 2' 9\	18
104	114 - Public	Courthouse	0	2,600	48	4-Lamp T8 F	114	48	4 LAMP 4' 1\	60	6,739	0	2.592		114 - Public	2,600	48	4 LAMP 4' 1\	60
105	115 - Offices	Courthouse	0	2,600	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,030	0	0.396		115 - Offices	2,600	9	2 LAMP 2' 9\	18
106	114 - County	Courthouse	0	2,600	5	4-Lamp T8 F	114	5	4 LAMP 4' 1\	60	702	0	0.27		114 - County	2,600	5	4 LAMP 4' 1\	60
107	111 - Office	Courthouse	0	800	7	2-Lamp T8-U	62	7	2 LAMP 2' 9\	18	246	0	0.308		111 - Office	800	7	2 LAMP 2' 9\	18
108	111 - Office	Courthouse	0	2,600	1	2-Lamp T12	72	1	2 LAMP 2' 9\	18	140	0	0.054		111 - Office	2,600	1	2 LAMP 2' 9\	18
109	109 - Copy R	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		109 - Copy R	2,600	4	2 LAMP 2' 9\	18
110	112 - Office	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		112 - Office	2,600	4	2 LAMP 2' 9\	18
111	108 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		108 - Office	2,600	4	4 LAMP 4' 1\	60
112	107 - Office	Courthouse	0	2,600	6	3-Lamp T8 F	93	6	3 LAMP 4' 1\	45	749	0	0.288		107 - Office	2,600	6	3 LAMP 4' 1\	45
113	106 - Office	Courthouse	0	2,600	5	4-Lamp T8 F	114	5	4 LAMP 4' 1\	60	702	0	0.27		106 - Office	2,600	5	4 LAMP 4' 1\	60
114	100 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		100 - Office	2,600	4	4 LAMP 4' 1\	60
115	101 - Office	Courthouse	0	2,600	10	2-Lamp T8-U	62	10	2 LAMP 2' 9\	18	1,144	0	0.44		101 - Office	2,600	10	2 LAMP 2' 9\	18
116	101 - Office	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		101 - Office	2,600	2	2 LAMP 2' 9\	18
117	103 - Office	Courthouse	0	2,600	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	915	0	0.352		103 - Office	2,600	8	2 LAMP 2' 9\	18
118	103 - Office	Courthouse	0	2,600	4	4-Lamp T8 F	114	4	4 LAMP 4' 1\	60	562	0	0.216		103 - Office	2,600	4	4 LAMP 4' 1\	60
119	104 - Office	Courthouse	0	2,600	4	4-Lamp T8 F	114	4	4 LAMP 4' 1\	60	562	0	0.216		104 - Office	2,600	4	4 LAMP 4' 1\	60
120	104 - Office	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 1\	30	83	0	0.032		104 - Office	2,600	1	2 LAMP 4' 1\	30
121	104 - Office	Courthouse	0	2,600	1	1-Lamp T8 2	22	1	2 LAMP 2' 9\	18	10	0	0.004		104 - Office	2,600	1	2 LAMP 2' 9\	18
122	104 - Office	Courthouse	0	2,600	2	2-Lamp T12	88	2	2 LAMP 4' 1\	30	302	0	0.116		104 - Office	2,600	2	2 LAMP 4' 1\	30
123	104 - Office	Courthouse	0	2,600	2	4-Lamp T8 F	114	2	4 LAMP 4' 1\	60	281	0	0.108		104 - Office	2,600	2	4 LAMP 4' 1\	60
124	113 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		113 - Office	2,600	4	4 LAMP 4' 1\	60
125	119 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		119 - Office	2,600	4	4 LAMP 4' 1\	60
126	121 - Office	Courthouse	0	2,600	20	2-Lamp T8-U	62	20	2 LAMP 2' 9\	18	2,288	0	0.88		121 - Office	2,600	20	2 LAMP 2' 9\	18
127	123 - Office	Courthouse	0	2,600	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	686	0	0.264		123 - Office	2,600	6	2 LAMP 2' 9\	18
128	123 - Office	Courthouse	0	2,600	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,030	0	0.396		123 - Office	2,600	9	2 LAMP 2' 9\	18
129	Entrance 118	Courthouse	0	3,000	12	2-Lamp T8-U	62	12	2 LAMP 2' 9\	18	1,584	0	0.528		Entrance 118	3,000	12	2 LAMP 2' 9\	18
130	Jan-00	Courthouse	0	2,600	33	2-Lamp T8-U	62	33	2 LAMP 2' 9\	18	3,775	0	1.452		5	2,600	33	2 LAMP 2' 9\	18
131	006 - Boiler F	Courthouse	0	2,600	2	1-Lamp CFL	21	2	1 LAMP 13W	13	42	0	0.016		006 - Boiler F	2,600	2	1 LAMP 13W	13
132	003 - Storage	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		003 - Storage	2,600	4	4 LAMP 4' 1\	60
133	007 - Storage	Courthouse	0	2,600	2	4-Lamp T12	176	2	4 LAMP 4' 1\	60	603	0	0.232		007 - Storage	2,600	2	4 LAMP 4' 1\	60
134	002 - Office	Courthouse	0	2,600	8	4-Lamp T12	176	8	4 LAMP 4' 1\	60	2,413	0	0.928		002 - Office	2,600	8	4 LAMP 4' 1\	60
135	002 - Office	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9\	18	114	0	0.044		002 - Office	2,600	1	2 LAMP 2' 9\	18
136	001 - Storage	Courthouse	0	2,600	6	2-Lamp T8 F	62	6	2 LAMP 4' 1\	30	499	0	0.192		001 - Storage	2,600	6	2 LAMP 4' 1\	30
137	001 - Storage	Courthouse	0	2,600	2	2-Lamp 8' T8	160	2	2 LAMP 4' 1\	30	676	0	0.26		001 - Storage	2,600	2	2 LAMP 4' 1\	30
138	014 - Office	Courthouse	0	2,600	3	2-Lamp T8 F	62	3	2 LAMP 4' 1\	30	250	0	0.096		014 - Office	2,600	3	2 LAMP 4' 1\	30
139	014 - Office	Courthouse	0	2,600	3	2-Lamp T12	88	3	2 LAMP 4' 1\	30	452	0	0.174		014 - Office	2,600	3	2 LAMP 4' 1\	30
140	011 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		011 - Office	2,600	4	4 LAMP 4' 1\	60
141	009 - Office	Courthouse	0	2,600	4	4-Lamp T12	176	4	4 LAMP 4' 1\	60	1,206	0	0.464		009 - Office	2,600	4	4 LAMP 4' 1\	60
142	010 - Office	Courthouse	0	2,600	1	2-Lamp T12	72	1	2 LAMP 2' 9\	18	140	0	0.054		010 - Office	2,600	1	2 LAMP 2' 9\	18
143	010 - Office	Courthouse	0	2,600	34	3-Lamp T8 F	93	34	3 LAMP 4' 1\	45	4,243	0	1.632		010 - Office	2,600	34	3 LAMP 4' 1\	45
144	3rd Floor B&	Courthouse	0	2,600	1	1-Lamp CFL	21	1	1 LAMP 13W	13	21	0	0.008		3rd Floor B&	2,600	1	1 LAMP 13W	13
145	3.1 - Elevator	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		3.1 - Elevator	2,600	4	2 LAMP 2' 9\	18
146	B3.1 - Men's	Courthouse	0	2,600	2	2-Lamp T8 F	62	2	2 LAMP 4' 1\	30	166	0	0.064		B3.1 - Men's	2,600	2	2 LAMP 4' 1\	30
147	350 - Office	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		350 - Office	2,600	4	2 LAMP 2' 9\	18
148	3.2 - 3rd Floo	Courthouse	0	3,000	10	2-Lamp T8-U	62	10	2 LAMP 2' 9\	18	1,320	0	0.44		3.2 - 3rd Floo	3,000	10	2 LAMP 2' 9\	18
149	B3.2 - Wome	Courthouse	0	2,600	2	2-Lamp T8 F	62	2	2 LAMP 4' 1\	30	166	0	0.064		B3.2 - Wome	2,600	2	2 LAMP 4' 1\	30
150	2nd Floor B&	Courthouse	0	2,600	1	1-Lamp CFL	21	1	1 LAMP 13W	13	21	0	0.008		2nd Floor B&	2,600	1	1 LAMP 13W	13
151	2.1 - Elevator	Courthouse	0	3,000	5	2-Lamp T8-U	62	5	2 LAMP 2' 9\	18	660	0	0.22		2.1 - Elevator	3,000	5	2 LAMP 2' 9\	18
152	240F - Confe	Courthouse	0	2,600	1	3-Lamp T8 F	93	1	3 LAMP 4' 1\	45	125	0	0.048		240F - Confe	2,600	1	3 LAMP 4' 1\	45
153	240E - Confe	Courthouse	0	2,600	1	3-Lamp T8 F	93	1	3 LAMP 4' 1\	45	125	0	0.048		240E - Confe	2,600	1	3 LAMP 4' 1\	45
154	B2.1 - Men's	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 1\	30	83	0	0.032		B2.1 - Men's	2,600	1	2 LAMP 4' 1\	30
155	Closet Next t	Courthouse	0	2,600	1	1-Lamp Inc.	60	1	18W A21 LE	18	109	0	0.042		Closet Next t	2,600	1	18W A21 LE	18
156	B2.2 - Wome	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 1\	30	83	0	0.032		B2.2 - Wome	2,600	1	2 LAMP 4' 1\	30
157	2.2 - Hallway	Courthouse	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	396	0	0.132		2.2 - Hallway	3,000	3	2 LAMP 2' 9\	18
158	2.3 - Hallway	Courthouse	0	3,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,188	0	0.396		2.3 - Hallway	3,000	9	2 LAMP 2' 9\	18
159	243 - Confer	Courthouse	0	2,600	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	458	0	0.176		243 - Confer	2,600	4	2 LAMP 2' 9\	18
160	B2.3 - Wome	Courthouse	0	2,600	2	4-Lamp T8 F	114	2	4 LAMP 4' 1\	60	281	0	0.108		B2.3 - Wome	2,600	2	4 LAMP 4' 1\	60
161	1.1 - First Flo	Courthouse	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		1.1 - First Flo	3,000	8	2 LAMP 2' 9\	18
162	1.2 - Elevator	Courthouse	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		1.2 - Elevator	3,000	8	2 LAMP 2' 9\	18
163	1st Floor Clo	Courthouse	0	2,600	1	1-Lamp CFL	21	1	1 LAMP 13W	13	21	0	0.008		1st Floor Clo	2,600	1	1 LAMP 13W	13
164	1.3 - Hallway	Courthouse	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		1.3 - Hallway	3,000	8	2 LAMP 2' 9\	18
165	1.4 - Hallway	Courthouse	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	264	0	0.088		1.4 - Hallway	3,000	2	2 LAMP 2' 9\	18
166	1.5 - Hallway	Courthouse	0	3,000	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	792	0	0.264		1.5 - Hallway	3,000	6	2 LAMP 2' 9\	18
167	1.6 - Hallway	Courthouse	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	264	0	0.088		1.6 - Hallway	3,000	2	2 LAMP 2' 9\	18
168	150 - Sheriff	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		150 - Sheriff	2,600	2	2 LAMP 2' 9\	18
169	1.7 - Hallway	Courthouse	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	396	0	0.132		1.7 - Hallway	3,000	3	2 LAMP 2' 9\	18
170	1.8 - Hallway	Courthouse	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		1.8 - Hallway	3,000	8	2 LAMP 2' 9\	18
171	B1.7 - Men's	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		B1.7 - Men's	2,600	2	2 LAMP 2' 9\	18
172	Closet by B1	Courthouse	0	2,600	1	1-Lamp Inc.	0	1	1 LAMP 13W	13	(34)	0	-0.013		Closet by B1	2,600	1	1 LAMP 13W	13
173	B1.8 - Wome	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		B1.8 - Wome	2,600	2	2 LAMP 2' 9\	18
174	1.9 - Hallway	Courthouse	0	3,000	7	2-Lamp T8-U	62	7	2 LAMP 2' 9\	18	924	0	0.308		1.9 - Hallway	3,000	7	2 LAMP 2' 9\	18
175	0.1 - Elevator	Courthouse	0	3,000	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	792	0	0.264		0.1 - Elevator	3,000	6	2 LAMP 2' 9\	18
176	B0.1 - Men's	Courthouse	0	2,600	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	229	0	0.088		B0.1 - Men's	2,600	2	2 LAMP 2' 9\	18
177	0.2 - Hallway	Courthouse	0	3,000	10	2-Lamp T8-U	62	10	2 LAMP 2' 9\	18	1,320	0	0.44		0.2 - Hallway	3,000	10	2 LAMP 2' 9\	18
178	17A - Networ	Courthouse	0	2,000	2	4-Lamp T8 2	114	2	4 LAMP 4' 1\	60	216	0	0.108		17A - Networ	2,000	2	4 LAMP 4' 1\	60
179	16 - Café	Courthouse	0	2,600	10	3-Lamp T8 F	93	10	3 LAMP 4' 1\	45	1,248	0	0.48		16 - Café	2,600	10	3 LAMP 4' 1\	45
180	16A - Café H	Courthouse	0	2,600	1	3-Lamp T8 F	93	1	3 LAMP 4' 1\	45	125	0	0.048		16A - Café H	2,600	1	3 LAMP 4' 1\	45
181	16A - Café H	Courthouse	0	2,600	1	3-Lamp T8 2	93	1	3 LAMP 4' 1\	45	125	0	0.048		16A - Café H	2,600	1	3 LAMP 4' 1\	45
182	18D - Jury R	Courthouse	0	2,600	12	2-Lamp T8-U	62	12	2 LAMP 2' 9\	18	1,373	0	0.528		18D - Jury R	2,600	12	2 LAMP 2' 9\	18
183	18A - Confer	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 1\	45	250	0	0.096		18A - Confer	2,600	2	3 LAMP 4' 1\	45
184	18B - Confer	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 1\	45	250	0	0.096		18B - Confer	2,600	2	3 LAMP 4' 1\	45

185	18 - Sitting R	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 1	45	250	0	0.096		18 - Sitting R	2,600	2	3 LAMP 4' 1	45
186	18 - Sitting R	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		18 - Sitting R	2,600	1	2 LAMP 2' 9	18
187	18C - Recep	Courthouse	0	3,000	2	3-Lamp T8 F	93	2	3 LAMP 4' 1	45	288	0	0.096		18C - Recep	3,000	2	3 LAMP 4' 1	45
188	0.3 - Hallway	Courthouse	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		0.3 - Hallway	3,000	2	2 LAMP 2' 9	18
189	19A - Small (	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 1	45	250	0	0.096		19A - Small (	2,600	2	3 LAMP 4' 1	45
190	19B - Small (	Courthouse	0	2,600	2	3-Lamp T8 F	93	2	3 LAMP 4' 1	45	250	0	0.096		19B - Small (	2,600	2	3 LAMP 4' 1	45
191	19C - Walk \	Courthouse	0	3,000	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	132	0	0.044		19C - Walk \	3,000	1	2 LAMP 2' 9	18
192	19D - Small (	Courthouse	0	2,600	12	3-Lamp T8 F	93	12	3 LAMP 4' 1	45	1,498	0	0.576		19D - Small (	2,600	12	3 LAMP 4' 1	45
193	0.3 - Hallway	Courthouse	0	3,000	5	2-Lamp T8-U	62	5	2 LAMP 2' 9	18	660	0	0.22		0.3 - Hallway	3,000	5	2 LAMP 2' 9	18
194	B0.5 - Wome	Courthouse	0	2,600	2	2-Lamp T8 2	33	2	2 LAMP 2' 9	18	78	0	0.03		B0.5 - Wome	2,600	2	2 LAMP 2' 9	18
195	B0.5 - Wome	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 1	30	83	0	0.032		B0.5 - Wome	2,600	1	2 LAMP 4' 1	30
196	026 - Closet	Courthouse	0	2,600	1	1-Lamp CFL	21	1	1 LAMP 13W	13	21	0	0.008		026 - Closet	2,600	1	1 LAMP 13W	13
197	023 - Boiler F	Courthouse	0	2,600	3	2-Lamp T8 2	62	3	2 LAMP 4' 1	30	250	0	0.096		023 - Boiler F	2,600	3	2 LAMP 4' 1	30
198	023 - Boiler F	Courthouse	0	2,600	1	2-Lamp T8 1	62	1	2 LAMP 4' 1	30	83	0	0.032		023 - Boiler F	2,600	1	2 LAMP 4' 1	30
199	023 - Boiler F	Courthouse	0	2,600	5	1-Lamp CFL	21	5	1 LAMP 13W	13	104	0	0.04		023 - Boiler F	2,600	5	1 LAMP 13W	13
200	023 - Boiler F	Courthouse	0	2,600	2	1-Lamp 100W	122	2	16W LED R8	16	551	0	0.212		023 - Boiler F	2,600	2	16W LED R8	16
201	023 - Boiler F	Courthouse	0	2,600	1	1-Lamp 100W	122	1	16W LED R8	16	276	0	0.106		023 - Boiler F	2,600	1	16W LED R8	16
202	023A - Boiler	Courthouse	0	2,600	1	1-Lamp CFL	21	1	1 LAMP 13W	13	21	0	0.008		023A - Boiler	2,600	1	1 LAMP 13W	13
203	023A - Boiler	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 1	30	83	0	0.032		023A - Boiler	2,600	1	2 LAMP 4' 1	30
204	023B - Boiler	Courthouse	0	2,600	2	2-Lamp T8 4	62	2	2 LAMP 4' 1	30	166	0	0.064		023B - Boiler	2,600	2	2 LAMP 4' 1	30
205	023B - Boiler	Courthouse	0	2,600	3	1-Lamp 100W	122	3	16W LED R8	16	827	0	0.318		023B - Boiler	2,600	3	16W LED R8	16
206	023B - Boiler	Courthouse	0	2,600	1	2-Lamp T8 F	62	1	2 LAMP 4' 1	30	83	0	0.032		023B - Boiler	2,600	1	2 LAMP 4' 1	30
207	050 - Break I	Courthouse	0	2,600	6	3-Lamp T8 F	93	6	3 LAMP 4' 1	45	749	0	0.288		050 - Break I	2,600	6	3 LAMP 4' 1	45
208	27A - Wome	Courthouse	0	2,600	6	3-Lamp T8 F	93	6	3 LAMP 4' 1	45	749	0	0.288		27A - Wome	2,600	6	3 LAMP 4' 1	45
209	0.4 - Hallway	Courthouse	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9	18	1,056	0	0.352		0.4 - Hallway	3,000	8	2 LAMP 2' 9	18
210	051 - Server/	Courthouse	0	2,000	10	2-Lamp T8-U	62	10	2 LAMP 2' 9	18	880	0	0.44		051 - Server/	2,000	10	2 LAMP 2' 9	18
211	052 - Compu	Courthouse	0	2,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9	18	792	0	0.396		052 - Compu	2,000	9	2 LAMP 2' 9	18
212	052A - Office	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		052A - Office	2,600	1	2 LAMP 2' 9	18
213	052B - Close	Courthouse	0	2,600	1	1-Lamp CFL	21	1	1 LAMP 13W	13	21	0	0.008		052B - Close	2,600	1	1 LAMP 13W	13
214	0.5 - Hallway	Courthouse	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9	18	396	0	0.132		0.5 - Hallway	3,000	3	2 LAMP 2' 9	18
215	Closet 0.1	Courthouse	0	2,600	1	1-Lamp 4-Pir	21	1	1 LAMP 13W	13	21	0	0.008		Closet 0.1	2,600	1	1 LAMP 13W	13
216	033A - Gene	Courthouse	0	2,600	1	2-Lamp T8 4	62	1	2 LAMP 4' 1	30	83	0	0.032		033A - Gene	2,600	1	2 LAMP 4' 1	30
217	033 - Storag	Courthouse	0	2,600	4	2-Lamp T8 F	62	4	2 LAMP 4' 1	30	333	0	0.128		033 - Storag	2,600	4	2 LAMP 4' 1	30
218	055 - Storag	Courthouse	0	2,600	3	1-Lamp CFL	21	3	1 LAMP 13W	13	62	0	0.024		055 - Storag	2,600	3	1 LAMP 13W	13
219	055 - Storag	Courthouse	0	2,600	1	1-Lamp CFL	21	1	18W A21 LE	18	8	0	0.003		055 - Storag	2,600	1	18W A21 LE	18
220	055 - Storag	Courthouse	0	2,600	1	1-Lamp Inc.	60	1	1 LAMP 13W	13	122	0	0.047		055 - Storag	2,600	1	1 LAMP 13W	13
221	050 - Men's I	Courthouse	0	2,600	5	3-Lamp T8 F	93	5	3 LAMP 4' 1	45	624	0	0.24		050 - Men's I	2,600	5	3 LAMP 4' 1	45
222	050 - Men's I	Courthouse	0	2,600	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	114	0	0.044		050 - Men's I	2,600	1	2 LAMP 2' 9	18
223	B0.6 - Men's	Courthouse	0	2,600	2	2-Lamp T8 F	62	2	2 LAMP 4' 1	30	166	0	0.064		B0.6 - Men's	2,600	2	2 LAMP 4' 1	30
224	Stairwell A	Courthouse	0	3,000	1	1-Lamp T8 4	32	1	1 LAMP 4' 1	15	51	0	0.017		Stairwell A	3,000	1	1 LAMP 4' 1	15
225	Stairwell A	Courthouse	0	3,000	9	1-Lamp T8 4	32	9	1 LAMP 4' 1	15	459	0	0.153		Stairwell A	3,000	9	1 LAMP 4' 1	15
226	Stairwell A	Courthouse	0	3,000	1	4-Lamp T8 F	114	1	4 LAMP 4' 1	60	162	0	0.054		Stairwell A	3,000	1	4 LAMP 4' 1	60
227	Stairwell B	Courthouse	0	3,000	15	1-Lamp CFL	21	15	1 LAMP 13W	13	360	0	0.12		Stairwell B	3,000	15	1 LAMP 13W	13
228	Stairwell B	Courthouse	0	3,000	3	1-Lamp Inc.	60	3	29W PAR38	29	279	0	0.093		Stairwell B	3,000	3	29W PAR38	29
229	Stairwell B	Courthouse	0	3,000	1	1-Lamp 65W	65	1	17W PAR38	17	144	0	0.048		Stairwell B	3,000	1	17W PAR38	17
230	Stairwell B	Courthouse	0	3,000	1	1-Lamp Spot	0	1	29W PAR38	29	(87)	0	-0.029		Stairwell B	3,000	1	29W PAR38	29
231	Elevator 1	Courthouse	0	2,600	3	2-Lamp T8 2	62	3	2 LAMP 4' 1	30	250	0	0.096		Elevator 1	2,600	3	2 LAMP 4' 1	30
232	Elevator 2	Courthouse	0	2,600	3	2-Lamp T8 2	62	3	2 LAMP 4' 1	30	250	0	0.096		Elevator 2	2,600	3	2 LAMP 4' 1	30
233	May-00	Courthouse	0	2,600	1	3-Lamp T8 F	93	1	3 LAMP 4' 1	45	125	0	0.048		144	2,600	1	3 LAMP 4' 1	45
234	144 - Mech (	Courthouse	0	2,600	1	2-Lamp T8 4	62	1	2 LAMP 4' 1	30	83	0	0.032		144 - Mech (	2,600	1	2 LAMP 4' 1	30
235	Penthouse	Courthouse	0	2,000	5	Screw In Per	21	5	18W A21 LE	18	30	0	0.015		Penthouse	2,000	5	18W A21 LE	18
236	Penthouse	Courthouse	0	2,000	2	100W A Fixt	110	2	18W A21 LE	18	368	0	0.184		Penthouse	2,000	2	18W A21 LE	18
237	Penthouse	Courthouse	0	2,000	3	CFL 42W Fix	42	3	18W A21 LE	18	144	0	0.072		Penthouse	2,000	3	18W A21 LE	18
238	Exterior	Courthouse	0	4,000	10	1-Lamp T8 1	15	10	1 LAMP 18"	7	320	0	0.08		Exterior	4,000	10	1 LAMP 18"	7
239	Exterior	Courthouse	0	4,000	3	1-Lamp 250W	295	3	27W LED R8	27	3,216	0	0.804		Exterior	4,000	3	27W LED R8	27
	Jan-00	Jan-00	0		0	Jan-00	0	0		0	0	0	0		0		0	Jan-00	0
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	Courthouse Totals				**1,335**			**1,335**			**167,241**	**0**	**63**		**Courthouse Totals**		**1,335**		
	Jail '85														**Jail '85**				
1	Capt's Office	Jail '85	0	2,600	4	2x4, 4 Lamp	148	4	4 LAMP 4' 1	60	915	0	0.352		Capt's Office	2,600	4	4 LAMP 4' 1	60
2	Office Restro	Jail '85	0	2,600	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1	30	109	0	0.042		Office Restro	2,600	1	2 LAMP 4' 1	30
3	Attic Stairs	Jail '85	0	1,200	3	1x4, 2-Lamp	72	3	2 LAMP 4' 1	30	151	0	0.126		Attic Stairs	1,200	3	2 LAMP 4' 1	30
4	Elev Mech R	Jail '85	0	1,200	6	1x4, 2-Lamp	72	6	2 LAMP 4' 1	30	302	0	0.252		Elev Mech R	1,200	6	2 LAMP 4' 1	30
5	Elev Lobby	Jail '85	0	8,760	2	1x4, 2-Lamp	72	2	2 LAMP 4' 1	30	736	0	0.084		Elev Lobby	8,760	2	2 LAMP 4' 1	30
6	Corridor - Ea	Jail '85	0	8,760	24	1x4, 2-Lamp	72	24	2 LAMP 4' 1	30	8,830	0	1.008		Corridor - Ea	8,760	24	2 LAMP 4' 1	30
7	East - Large	Jail '85	0	5,840	48	2', 2 Lamp, T	50	48	2 LAMP 2' 9	18	8,970	0	1.536		East - Large	5,840	48	2 LAMP 2' 9	18
8	East - Large	Jail '85	0	5,840	3	26w CFL	26	3	1 LAMP 13W	13	228	0	0.039		East - Large	5,840	3	1 LAMP 13W	13
9	East - Large	Jail '85	0	5,840	45	1x4, 4-Lamp	148	45	4 LAMP 4' 1	60	23,126	0	3.96		East - Large	5,840	45	4 LAMP 4' 1	60
10	East - Small	Jail '85	0	5,840	16	2', 2 Lamp, T	50	16	2 LAMP 2' 9	18	2,990	0	0.512		East - Small	5,840	16	2 LAMP 2' 9	18
11	East - Small	Jail '85	0	5,840	2	26w CFL	26	2	1 LAMP 13W	13	152	0	0.026		East - Small	5,840	2	1 LAMP 13W	13
12	East - Small	Jail '85	0	5,840	30	1x4, 4-Lamp	148	30	4 LAMP 4' 1	60	15,418	0	2.64		East - Small	5,840	30	4 LAMP 4' 1	60
13	Control Roon	Jail '85	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		Control Roon	8,760	3	2 LAMP 4' 1	30
14	Storage	Jail '85	0	1,200	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1	30	50	0	0.042		Storage	1,200	1	2 LAMP 4' 1	30
15	Elec Room	Jail '85	0	1,200	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1	30	50	0	0.042		Elec Room	1,200	1	2 LAMP 4' 1	30
16	North - Smal	Jail '85	0	5,840	32	2', 2 Lamp, T	50	32	2 LAMP 2' 9	18	5,980	0	1.024		North - Smal	5,840	32	2 LAMP 2' 9	18
17	North - Smal	Jail '85	0	5,840	4	26w CFL	26	4	1 LAMP 13W	13	304	0	0.052		North - Smal	5,840	4	1 LAMP 13W	13
18	North - Smal	Jail '85	0	5,840	60	1x4, 4-Lamp	148	60	4 LAMP 4' 1	60	30,835	0	5.28		North - Smal	5,840	60	4 LAMP 4' 1	60
19	Mop Closet	Jail '85	0	1,200	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1	30	50	0	0.042		Mop Closet	1,200	1	2 LAMP 4' 1	30
20	Rec Yard 1	Jail '85	0	4,400	2	400w HPS F	465	2	125W LED F	125	2,992	0	0.68		Rec Yard 1	4,400	2	125W LED F	125
21	Rec Yard 2&	Jail '85	0	4,400	2	400w HPS F	465	2	125W LED F	125	2,992	0	0.68		Rec Yard 2&	4,400	2	125W LED F	125
22	Rec Office	Jail '85	0	8,760	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1	30	368	0	0.042		Rec Office	8,760	1	2 LAMP 4' 1	30
23	Corridor - No	Jail '85	0	8,760	16	1x4, 2-Lamp	72	16	2 LAMP 4' 1	30	5,887	0	0.672		Corridor - No	8,760	16	2 LAMP 4' 1	30
24	Control Roon	Jail '85	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		Control Roon	8,760	2	2 LAMP 4' 1	30
25	South - Large	Jail '85	0	5,840	16	2', 2 Lamp, T	50	16	2 LAMP 2' 9	18	2,990	0	0.512		South - Large	5,840	16	2 LAMP 2' 9	18

26	South - Large	Jail '85	0	5,840	1	26w CFL	26	1	1 LAMP 13W	13	76	0	0.013		South - Large	5,840	1	1 LAMP 13W	13
27	South - Large	Jail '85	0	5,840	15	1x4, 4-Lamp	148	15	4 LAMP 4' 1S	60	7,709	0	1.32		South - Large	5,840	15	4 LAMP 4' 1S	60
28	South - Small	Jail '85	0	5,840	16	2', 2 Lamp, T	50	16	2 LAMP 2' 9W	18	2,990	0	0.512		South - Small	5,840	16	2 LAMP 2' 9W	18
29	South - Small	Jail '85	0	5,840	2	26w CFL	26	2	1 LAMP 13W	13	152	0	0.026		South - Small	5,840	2	1 LAMP 13W	13
30	South - Small	Jail '85	0	5,840	30	1x4, 4-Lamp	148	30	4 LAMP 4' 1S	60	15,418	0	2.64		South - Small	5,840	30	4 LAMP 4' 1S	60
31	Corridor - So	Jail '85	0	8,760	6	1x4, 2-Lamp	72	6	2 LAMP 4' 1S	30	2,208	0	0.252		Corridor - So	8,760	6	2 LAMP 4' 1S	30
32	Video Court \	Jail '85	0	8,760	1	2x2, 2 Lamp,	78	1	2 LAMP 2' 9W	18	526	0	0.06		Video Court \	8,760	1	2 LAMP 2' 9W	18
33	Video Court \	Jail '85	0	8,760	1	2x4, 4 Lamp,	148	1	4 LAMP 4' 1S	60	771	0	0.088		Video Court \	8,760	1	4 LAMP 4' 1S	60
34	Video Court I	Jail '85	0	8,760	4	2x4, 4 Lamp,	148	4	4 LAMP 4' 1S	60	3,084	0	0.352		Video Court I	8,760	4	4 LAMP 4' 1S	60
35	Video Court I	Jail '85	0	8,760	1	2x2, 2 Lamp,	78	1	2 LAMP 2' 9W	18	526	0	0.06		Video Court I	8,760	1	2 LAMP 2' 9W	18
36	Classroom	Jail '85	0	8,760	20	2x4, 4 Lamp,	148	20	4 LAMP 4' 1S	60	15,418	0	1.76		Classroom	8,760	20	4 LAMP 4' 1S	60
37	Classroom C	Jail '85	0	2,600	1	2x4, 4 Lamp,	148	1	4 LAMP 4' 1S	60	229	0	0.088		Classroom C	2,600	1	4 LAMP 4' 1S	60
38	Classroom	Jail '85	0	8,760	20	2x4, 4 Lamp,	148	20	4 LAMP 4' 1S	60	15,418	0	1.76		Classroom	8,760	20	4 LAMP 4' 1S	60
39	Video Court I	Jail '85	0	8,760	4	2x4, 4 Lamp,	148	4	4 LAMP 4' 1S	60	3,084	0	0.352		Video Court I	8,760	4	4 LAMP 4' 1S	60
40	Video Court I	Jail '85	0	8,760	1	2x2, 2 Lamp,	78	1	2 LAMP 2' 9W	18	526	0	0.06		Video Court I	8,760	1	2 LAMP 2' 9W	18
41	Classroom C	Jail '85	0	2,600	1	2x4, 4 Lamp,	148	1	4 LAMP 4' 1S	60	229	0	0.088		Classroom C	2,600	1	4 LAMP 4' 1S	60
42	Video Court \	Jail '85	0	8,760	1	2x2, 2 Lamp,	78	1	2 LAMP 2' 9W	18	526	0	0.06		Video Court \	8,760	1	2 LAMP 2' 9W	18
43	Video Court \	Jail '85	0	8,760	2	2x4, 4 Lamp,	148	2	4 LAMP 4' 1S	60	1,542	0	0.176		Video Court \	8,760	2	4 LAMP 4' 1S	60
44	Corridor - W	Jail '85	0	8,760	24	1x4, 2-Lamp	72	24	2 LAMP 4' 1S	30	8,830	0	1.008		Corridor - W	8,760	24	2 LAMP 4' 1S	30
45	West - Large	Jail '85	0	5,840	48	2', 2 Lamp, T	50	48	2 LAMP 2' 9W	18	8,970	0	1.536		West - Large	5,840	48	2 LAMP 2' 9W	18
46	West - Large	Jail '85	0	5,840	3	26w CFL	26	3	1 LAMP 13W	13	228	0	0.039		West - Large	5,840	3	1 LAMP 13W	13
47	West - Large	Jail '85	0	5,840	45	1x4, 4-Lamp	148	45	4 LAMP 4' 1S	60	23,126	0	3.96		West - Large	5,840	45	4 LAMP 4' 1S	60
48	West - Small	Jail '85	0	5,840	16	2', 2 Lamp, T	50	16	2 LAMP 2' 9W	18	2,990	0	0.512		West - Small	5,840	16	2 LAMP 2' 9W	18
49	West - Small	Jail '85	0	5,840	2	26w CFL	26	2	1 LAMP 13W	13	152	0	0.026		West - Small	5,840	2	1 LAMP 13W	13
50	West - Small	Jail '85	0	5,840	30	1x4, 4-Lamp	148	30	4 LAMP 4' 1S	60	15,418	0	2.64		West - Small	5,840	30	4 LAMP 4' 1S	60
51	Break Throug	Jail '85	0	8,760	4	1x4, 2-Lamp	72	4	2 LAMP 4' 1S	30	1,472	0	0.168		Break Throug	8,760	4	2 LAMP 4' 1S	30
52	Laundry	Jail '85	0	8,760	9	1x4, 2 Lamp,	62	9	2 LAMP 4' 1S	30	2,523	0	0.288		Laundry	8,760	9	2 LAMP 4' 1S	30
53	Corridors	Jail '85	0	8,760	28	2x2, 2 Lamp,	62	28	2 LAMP 2' 9W	18	10,792	0	1.232		Corridors	8,760	28	2 LAMP 2' 9W	18
54	Office - Serv	Jail '85	0	8,760	6	1x4, 2 Lamp,	62	6	2 LAMP 4' 1S	30	1,682	0	0.192		Office - Serv	8,760	6	2 LAMP 4' 1S	30
55	Lunch Room	Jail '85	0	8,760	14	1x4, 2 Lamp,	62	14	2 LAMP 4' 1S	30	3,924	0	0.448		Lunch Room	8,760	14	2 LAMP 4' 1S	30
56	Kitchen	Jail '85	0	8,760	38	1x4, 2 Lamp,	62	38	2 LAMP 4' 1S	30	10,652	0	1.216		Kitchen	8,760	38	2 LAMP 4' 1S	30
57	Kit. Hood	Jail '85	0	8,760	10	100w A19 In	100	10	18W A21 LE	18	7,183	0	0.82		Kit. Hood	8,760	10	18W A21 LE	18
58	Wash Area	Jail '85	0	8,760	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 1S	45	2,575	0	0.294		Wash Area	8,760	6	3 LAMP 4' 1S	45
59	Kit. Office	Jail '85	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1S	30	280	0	0.032		Kit. Office	8,760	1	2 LAMP 4' 1S	30
60	Kit Storage	Jail '85	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1S	30	2,243	0	0.256		Kit Storage	8,760	8	2 LAMP 4' 1S	30
61	Walkin	Jail '85	0	8,760	2	100w A19 In	100	2	18W A21 LE	18	1,437	0	0.164		Walkin	8,760	2	18W A21 LE	18
62	Walkin/Rece	Jail '85	0	8,760	10	1x4, 2 Lamp,	62	10	2 LAMP 4' 1S	30	2,803	0	0.32		Walkin/Rece	8,760	10	2 LAMP 4' 1S	30
63	Dry Storage	Jail '85	0	8,760	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1S	30	368	0	0.042		Dry Storage	8,760	1	2 LAMP 4' 1S	30
64	Dry Storage	Jail '85	0	8,760	1	1x4, 2-Lamp	72	1	2 LAMP 4' 1S	30	368	0	0.042		Dry Storage	8,760	1	2 LAMP 4' 1S	30
65	Garbage Car	Jail '85	0	8,760	2	1x4, 2-Lamp	72	2	2 LAMP 4' 1S	30	736	0	0.084		Garbage Car	8,760	2	2 LAMP 4' 1S	30
66	Garbage Car	Jail '85	0	8,760	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1S	45	858	0	0.098		Garbage Car	8,760	2	3 LAMP 4' 1S	45
67	Holding Cell	Jail '85	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1S	30	841	0	0.096		Holding Cell	8,760	3	2 LAMP 4' 1S	30
68	Holding Cell	Jail '85	0	8,760	6	1x4, 2 Lamp,	62	6	2 LAMP 4' 1S	30	1,682	0	0.192		Holding Cell	8,760	6	2 LAMP 4' 1S	30
69	Elev Mech R	Jail '85	0	1,200	2	1x4, 2-Lamp	72	2	2 LAMP 4' 1S	30	101	0	0.084		Elev Mech R	1,200	2	2 LAMP 4' 1S	30
70	L Room	Jail '85	0	8,760	7	1x4, 2-Lamp	72	7	2 LAMP 4' 1S	30	2,575	0	0.294		L Room	8,760	7	2 LAMP 4' 1S	30
71	East Court E	Jail '85	0	8,760	2	2x2, 2 Lamp,	78	2	2 LAMP 2' 9W	18	1,051	0	0.12		East Court E	8,760	2	2 LAMP 2' 9W	18
72	Officers Offic	Jail '85	0	8,760	2	2x2, 2 Lamp,	78	2	2 LAMP 2' 9W	18	1,051	0	0.12		Officers Offic	8,760	2	2 LAMP 2' 9W	18
73	Officers Offic	Jail '85	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1S	30	2,243	0	0.256		Officers Offic	8,760	8	2 LAMP 4' 1S	30
74	Storage 179	Jail '85	0	1,200	3	1x4, 2-Lamp	72	3	2 LAMP 4' 1S	30	151	0	0.126		Storage 179	1,200	3	2 LAMP 4' 1S	30
75	West Court E	Jail '85	0	8,760	2	2x2, 2 Lamp,	78	2	2 LAMP 2' 9W	18	1,051	0	0.12		West Court E	8,760	2	2 LAMP 2' 9W	18
76	Corridor to N	Jail '85	0	8,760	8	1x4, 2-Lamp	72	8	2 LAMP 4' 1S	30	2,943	0	0.336		Corridor to N	8,760	8	2 LAMP 4' 1S	30
77	Corridor to N	Jail '85	0	8,760	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 1S	45	1,717	0	0.196		Corridor to N	8,760	4	3 LAMP 4' 1S	45
78	Corridor - Ou	Jail '85	0	8,760	12	2x2, 2 Lamp,	78	12	2 LAMP 2' 9W	18	6,307	0	0.72		Corridor - Ou	8,760	12	2 LAMP 2' 9W	18
79	Storage	Jail '85	0	1,200	1	2x2, 2 Lamp,	78	1	2 LAMP 2' 9W	18	72	0	0.06		Storage	1,200	1	2 LAMP 2' 9W	18
80	storage	Jail '85	0	1,200	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1S	45	118	0	0.098		storage	1,200	2	3 LAMP 4' 1S	45
81	Staff Develop	Jail '85	0	8,760	9	2x4, 3 Lamp,	94	9	3 LAMP 4' 1S	45	3,863	0	0.441		Staff Develop	8,760	9	3 LAMP 4' 1S	45
82	B12	Jail '85	0	8,760	9	2x4, 3 Lamp,	94	9	3 LAMP 4' 1S	45	3,863	0	0.441		B12	8,760	9	3 LAMP 4' 1S	45
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	Jail '85 Totals				**842**			**842**			**325,496**	**0**	**49**		**Jail '85 Totals**		**842**		
	Justice Non-Jail														**Justice Non-Jail**				
1	181 Temp Se	Justice Non-Jail	0	4,000	2	3-Lamp T8 2	93	2	3 LAMP 4' 1S	45	384	0	0.096		181 Temp Se	4,000	2	3 LAMP 4' 1S	45
2	181 Temp Se	Justice Non-Jail	0	4,000	6	1-Lamp CFL	18	6	1 LAMP 13W	13	120	0	0.03		181 Temp Se	4,000	6	1 LAMP 13W	13
3	11 Court RM	Justice Non-Jail	0	3,000	5	3-Lamp T8 2	53	5	3 LAMP 4' 1S	45	120	0	0.04		11 Court RM	3,000	5	3 LAMP 4' 1S	45
4	11 Court RM	Justice Non-Jail	0	3,000	18	1-Lamp T8 4	32	18	1 LAMP 4' 1S	15	918	0	0.306		11 Court RM	3,000	18	1 LAMP 4' 1S	15
5	11 Court RM	Justice Non-Jail	0	3,000	12	1-Lamp T8 4	32	12	1 LAMP 4' 1S	15	612	0	0.204		11 Court RM	3,000	12	1 LAMP 4' 1S	15
6	131 Jury RM	Justice Non-Jail	0	3,000	6	3-Lamp T8 2	53	6	3 LAMP 4' 1S	45	144	0	0.048		131 Jury RM	3,000	6	3 LAMP 4' 1S	45
7	131 Jury - R	Justice Non-Jail	0	1,200	1	1-Lamp T12	46	1	1 LAMP 4' 1S	15	37	0	0.031		131 Jury - R	1,200	1	1 LAMP 4' 1S	15
8	131 Jury - H	Justice Non-Jail	0	4,000	2	2-Lamp T12	72	2	2 LAMP 2' 9W	18	432	0	0.108		131 Jury - H	4,000	2	2 LAMP 2' 9W	18
9	124 Women'	Justice Non-Jail	0	4,000	1	1-Lamp T12	46	1	1 LAMP 4' 1S	15	124	0	0.031		124 Women'	4,000	1	1 LAMP 4' 1S	15
10	123 Men's R	Justice Non-Jail	0	4,000	1	2-Lamp T8 4	62	1	2 LAMP 4' 1S	30	128	0	0.032		123 Men's R	4,000	1	2 LAMP 4' 1S	30
11	121 Copy RM	Justice Non-Jail	0	3,000	2	3-Lamp T12	127	2	3 LAMP 4' 1S	45	492	0	0.164		121 Copy RM	3,000	2	3 LAMP 4' 1S	45
12	128 Office	Justice Non-Jail	0	3,000	2	4-Lamp T8 2	114	2	4 LAMP 4' 1S	60	324	0	0.108		128 Office	3,000	2	4 LAMP 4' 1S	60
13	128 Office	Justice Non-Jail	0	3,000	1	2-Lamp T8-U	62	1	2 LAMP 2' 9W	18	132	0	0.044		128 Office	3,000	1	2 LAMP 2' 9W	18
14	128 Office	Justice Non-Jail	0	3,000	1	1-Lamp CFL	18	1	1 LAMP 13W	13	15	0	0.005		128 Office	3,000	1	1 LAMP 13W	13
15	11 Judges C	Justice Non-Jail	0	3,000	1	4-Lamp T8 2	114	1	4 LAMP 4' 1S	60	162	0	0.054		11 Judges C	3,000	1	4 LAMP 4' 1S	60
16	11 Judges C	Justice Non-Jail	0	3,000	1	8-Lamp T8 4	228	1	8 LAMP 4' 1S	120	324	0	0.108		11 Judges C	3,000	1	8 LAMP 4' 1S	120
17	11 Judges C	Justice Non-Jail	0	4,000	1	1-Lamp T12	46	1	1 LAMP 4' 1S	15	124	0	0.031		11 Judges C	4,000	1	1 LAMP 4' 1S	15
18	11 Judges C	Justice Non-Jail	0	2,000	1	1-Lamp CFL	18	1	1 LAMP 13W	13	10	0	0.005		11 Judges C	2,000	1	1 LAMP 13W	13
19	11 Court RM	Justice Non-Jail	0	4,000	7	2-Lamp T8-U	62	7	2 LAMP 2' 9W	18	1,232	0	0.308		11 Court RM	4,000	7	2 LAMP 2' 9W	18
20	12 Court RM	Justice Non-Jail	0	3,000	12	2-Lamp T8 4	62	12	2 LAMP 4' 1S	30	1,152	0	0.384		12 Court RM	3,000	12	2 LAMP 4' 1S	30
21	12 Court RM	Justice Non-Jail	0	3,000	24	1-Lamp T8 4	32	24	1 LAMP 4' 1S	15	1,224	0	0.408		12 Court RM	3,000	24	1 LAMP 4' 1S	15
22	112 Office	Justice Non-Jail	0	3,000	6	4-Lamp T12	176	6	4 LAMP 4' 1S	60	2,088	0	0.696		112 Office	3,000	6	4 LAMP 4' 1S	60
23	117 Office	Justice Non-Jail	0	3,000	2	4-Lamp T8 2	114	2	4 LAMP 4' 1S	60	324	0	0.108		117 Office	3,000	2	4 LAMP 4' 1S	60
24	118 Office	Justice Non-Jail	0	3,000	1	2-Lamp T8-U	62	1	2 LAMP 2' 9W	18	132	0	0.044		118 Office	3,000	1	2 LAMP 2' 9W	18

25	Judge Office	Justice Non-Jail	0	3,000	1	4-Lamp T8 2	114	1	4 LAMP 4' 1	60	162	0	0.054		Judge Office	3,000	1	4 LAMP 4' 1	60
26	Judge Office	Justice Non-Jail	0	3,000	1	8-Lamp T8 4	228	1	8 LAMP 4' 1	120	324	0	0.108		Judge Office	3,000	1	8 LAMP 4' 1	120
27	Judge Office	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		Judge Office	3,000	2	2 LAMP 2' 9	18
28	Men's Bathro	Justice Non-Jail	0	4,000	4	2-Lamp T12	88	4	2 LAMP 4' 1	30	928	0	0.232		Men's Bathro	4,000	4	2 LAMP 4' 1	30
29	Judge Marqu	Justice Non-Jail	0	4,000	7	4-Lamp T8 2	114	7	4 LAMP 4' 1	60	1,512	0	0.378		Judge Marqu	4,000	7	4 LAMP 4' 1	60
30	108A Office	Justice Non-Jail	0	3,000	14	1-Lamp CFL	18	14	1 LAMP 13W	13	210	0	0.07		108A Office	3,000	14	1 LAMP 13W	13
31	Hallway	Justice Non-Jail	0	4,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	352	0	0.088		Hallway	4,000	2	2 LAMP 2' 9	18
32	106 Office	Justice Non-Jail	0	3,000	4	4-Lamp T12	176	4	4 LAMP 4' 1	60	1,392	0	0.464		106 Office	3,000	4	4 LAMP 4' 1	60
33	106 Office	Justice Non-Jail	0	3,000	1	8-Lamp T12	352	1	8 LAMP 4' 1	120	696	0	0.232		106 Office	3,000	1	8 LAMP 4' 1	120
34	Courtroom B	Justice Non-Jail	0	3,000	6	8-Lamp T12	352	6	8 LAMP 4' 1	120	4,176	0	1.392		Courtroom B	3,000	6	8 LAMP 4' 1	120
35	Courtroom B	Justice Non-Jail	0	3,000	12	1-Lamp T8 4	32	12	1 LAMP 4' 1	15	612	0	0.204		Courtroom B	3,000	12	1 LAMP 4' 1	15
36	Courtroom B	Justice Non-Jail	0	3,000	6	1-Lamp T8 4	32	6	1 LAMP 4' 1	15	306	0	0.102		Courtroom B	3,000	6	1 LAMP 4' 1	15
37	Courtroom B	Justice Non-Jail	0	3,000	12	1-Lamp T8 4	32	12	1 LAMP 4' 1	15	612	0	0.204		Courtroom B	3,000	12	1 LAMP 4' 1	15
38	104 Office	Justice Non-Jail	0	3,000	6	4-Lamp T12	176	6	4 LAMP 4' 1	60	2,088	0	0.696		104 Office	3,000	6	4 LAMP 4' 1	60
39	102 Office	Justice Non-Jail	0	3,000	2	4-Lamp T12	176	2	4 LAMP 4' 1	60	696	0	0.232		102 Office	3,000	2	4 LAMP 4' 1	60
40	Judge Office	Justice Non-Jail	0	3,000	14	1-Lamp CFL	18	14	1 LAMP 13W	13	210	0	0.07		Judge Office	3,000	14	1 LAMP 13W	13
41	Judge Office	Justice Non-Jail	0	1,200	1	1-Lamp T12	36	1	1 LAMP 2' 9	9	32	0	0.027		Judge Office	1,200	1	1 LAMP 2' 9	9
42	Office Hallwa	Justice Non-Jail	0	4,000	3	2-Lamp T12-	72	3	2 LAMP 2' 9	18	648	0	0.162		Office Hallwa	4,000	3	2 LAMP 2' 9	18
43	107 Office	Justice Non-Jail	0	3,000	2	3-Lamp T12	127	2	3 LAMP 4' 1	45	492	0	0.164		107 Office	3,000	2	3 LAMP 4' 1	45
44	105 Office	Justice Non-Jail	0	3,000	14	2-Lamp T8-U	62	14	2 LAMP 2' 9	18	1,848	0	0.616		105 Office	3,000	14	2 LAMP 2' 9	18
45	107A Office	Justice Non-Jail	0	3,000	1	3-Lamp T12	127	1	3 LAMP 4' 1	45	246	0	0.082		107A Office	3,000	1	3 LAMP 4' 1	45
46	Bathroom By	Justice Non-Jail	0	4,000	1	1-Lamp T8 2	22	1	1 LAMP 2' 9	9	52	0	0.013		Bathroom By	4,000	1	1 LAMP 2' 9	9
47	102A Office	Justice Non-Jail	0	3,000	4	4-Lamp T12	176	4	4 LAMP 4' 1	60	1,392	0	0.464		102A Office	3,000	4	4 LAMP 4' 1	60
48	102B Office	Justice Non-Jail	0	3,000	4	4-Lamp T12	176	4	4 LAMP 4' 1	60	1,392	0	0.464		102B Office	3,000	4	4 LAMP 4' 1	60
49	Hallway Near	Justice Non-Jail	0	4,000	11	2-Lamp T12-	72	11	2 LAMP 2' 9	18	2,376	0	0.594		Hallway Near	4,000	11	2 LAMP 2' 9	18
50	103 Office	Justice Non-Jail	0	3,000	1	4-Lamp T12	176	1	4 LAMP 4' 1	60	348	0	0.116		103 Office	3,000	1	4 LAMP 4' 1	60
51	100A Office	Justice Non-Jail	0	3,000	6	4-Lamp T12	176	6	4 LAMP 4' 1	60	2,088	0	0.696		100A Office	3,000	6	4 LAMP 4' 1	60
52	100B Office	Justice Non-Jail	0	3,000	1	4-Lamp T12	176	1	4 LAMP 4' 1	60	348	0	0.116		100B Office	3,000	1	4 LAMP 4' 1	60
53	100 Judge O	Justice Non-Jail	0	3,000	16	1-Lamp Incar	60	16	16W A21 LE	16	2,112	0	0.704		100 Judge O	3,000	16	16W A21 LE	16
54	Hallway Near	Justice Non-Jail	0	4,000	4	2-Lamp T12-	72	4	2 LAMP 2' 9	18	864	0	0.216		Hallway Near	4,000	4	2 LAMP 2' 9	18
55	101C Office	Justice Non-Jail	0	3,000	1	4-Lamp T12	176	1	4 LAMP 4' 1	60	348	0	0.116		101C Office	3,000	1	4 LAMP 4' 1	60
56	101A Office	Justice Non-Jail	0	3,000	1	3-Lamp T12	127	1	3 LAMP 4' 1	45	246	0	0.082		101A Office	3,000	1	3 LAMP 4' 1	45
57	101D Office	Justice Non-Jail	0	3,000	1	3-Lamp T12	127	1	3 LAMP 4' 1	45	246	0	0.082		101D Office	3,000	1	3 LAMP 4' 1	45
58	Office Near 1	Justice Non-Jail	0	3,000	1	2-Lamp T8-U	62	1	2 LAMP 2' 9	18	132	0	0.044		Office Near 1	3,000	1	2 LAMP 2' 9	18
59	Courtroom B	Justice Non-Jail	0	3,000	6	8-Lamp T12	352	6	8 LAMP 4' 1	120	4,176	0	1.392		Courtroom B	3,000	6	8 LAMP 4' 1	120
60	Courtroom B	Justice Non-Jail	0	3,000	6	1-Lamp CFL	18	6	1 LAMP 13W	13	90	0	0.03		Courtroom B	3,000	6	1 LAMP 13W	13
61	154 H9	Justice Non-Jail	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9	18	396	0	0.132		154 H9	3,000	3	2 LAMP 2' 9	18
62	151 Judge O	Justice Non-Jail	0	3,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9	18	1,188	0	0.396		151 Judge O	3,000	9	2 LAMP 2' 9	18
63	151 Judge O	Justice Non-Jail	0	3,000	6	2-Lamp T8-U	62	6	2 LAMP 2' 9	18	792	0	0.264		151 Judge O	3,000	6	2 LAMP 2' 9	18
64	Closet Wall	Justice Non-Jail	0	2,000	1	1-Lamp CFL	18	1	1 LAMP 13W	13	10	0	0.005		Closet Wall	2,000	1	1 LAMP 13W	13
65	Court RM 16	Justice Non-Jail	0	3,000	12	1-Lamp T8 4	32	12	1 LAMP 4' 1	15	612	0	0.204		Court RM 16	3,000	12	1 LAMP 4' 1	15
66	Court RM 16	Justice Non-Jail	0	3,000	24	2-Lamp T8-U	62	24	2 LAMP 2' 9	18	3,168	0	1.056		Court RM 16	3,000	24	2 LAMP 2' 9	18
67	Hallway by C	Justice Non-Jail	0	4,000	7	2-Lamp T8-U	62	7	2 LAMP 2' 9	18	1,232	0	0.308		Hallway by C	4,000	7	2 LAMP 2' 9	18
68	153 Men's R	Justice Non-Jail	0	4,000	1	1-Lamp T12	46	1	1 LAMP 4' 1	15	124	0	0.031		153 Men's R	4,000	1	1 LAMP 4' 1	15
69	147 Copy RM	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		147 Copy RM	3,000	2	2 LAMP 2' 9	18
70	146 Elevator	Justice Non-Jail	0	4,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	352	0	0.088		146 Elevator	4,000	2	2 LAMP 2' 9	18
71	143 Judge O	Justice Non-Jail	0	3,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9	18	1,188	0	0.396		143 Judge O	3,000	9	2 LAMP 2' 9	18
72	143 Judge O	Justice Non-Jail	0	4,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	352	0	0.088		143 Judge O	4,000	2	2 LAMP 2' 9	18
73	143 Judge O	Justice Non-Jail	0	2,000	1	1-Lamp CFL	18	1	1 LAMP 13W	13	10	0	0.005		143 Judge O	2,000	1	1 LAMP 13W	13
74	144 Bathroor	Justice Non-Jail	0	4,000	1	1-Lamp T8 4	32	1	1 LAMP 4' 1	15	68	0	0.017		144 Bathroor	4,000	1	1 LAMP 4' 1	15
75	141 Office	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		141 Office	3,000	2	2 LAMP 2' 9	18
76	141 Office - (	Justice Non-Jail	0	2,000	1	1-Lamp CFL	18	1	1 LAMP 13W	13	10	0	0.005		141 Office - (	2,000	1	1 LAMP 13W	13
77	17 Court RM	Justice Non-Jail	0	3,000	24	2-Lamp T8-U	62	24	2 LAMP 2' 9	18	3,168	0	1.056		17 Court RM	3,000	24	2 LAMP 2' 9	18
78	17 Court RM	Justice Non-Jail	0	3,000	12	2-Lamp T8 4	62	12	2 LAMP 4' 1	30	1,152	0	0.384		17 Court RM	3,000	12	2 LAMP 4' 1	30
79	Secuirity Ent	Justice Non-Jail	0	4,000	4	2-Lamp T8-U	62	4	2 LAMP 2' 9	18	704	0	0.176		Secuirity Ent	4,000	4	2 LAMP 2' 9	18
80	Secuirity Ent	Justice Non-Jail	0	4,000	13	2-Lamp T8-U	62	13	2 LAMP 2' 9	18	2,288	0	0.572		Secuirity Ent	4,000	13	2 LAMP 2' 9	18
81	Secuirity Cer	Justice Non-Jail	0	4,000	2	4-Lamp T8 2	114	2	4 LAMP 4' 1	60	432	0	0.108		Secuirity Cer	4,000	2	4 LAMP 4' 1	60
82	214 Admin. F	Justice Non-Jail	0	3,000	23	2-Lamp T8-U	62	23	2 LAMP 2' 9	18	3,036	0	1.012		214 Admin. F	3,000	23	2 LAMP 2' 9	18
83	210 Family D	Justice Non-Jail	0	3,000	15	4-Lamp T12	176	15	4 LAMP 4' 1	60	5,220	0	1.74		210 Family D	3,000	15	4 LAMP 4' 1	60
84	210 Family D	Justice Non-Jail	0	3,000	1	2-Lamp T12-	72	1	2 LAMP 2' 9	18	162	0	0.054		210 Family D	3,000	1	2 LAMP 2' 9	18
85	210 Family D	Justice Non-Jail	0	2,600	8	4-Lamp T12	176	8	4 LAMP 4' 1	60	2,413	0	0.928		210 Family D	2,600	8	4 LAMP 4' 1	60
86	209 Family D	Justice Non-Jail	0	3,000	24	2-Lamp T8-U	62	24	2 LAMP 2' 9	18	3,168	0	1.056		209 Family D	3,000	24	2 LAMP 2' 9	18
87	209 Family D	Justice Non-Jail	0	3,000	2	2-Lamp T12-	72	2	2 LAMP 2' 9	18	324	0	0.108		209 Family D	3,000	2	2 LAMP 2' 9	18
88	209 Family D	Justice Non-Jail	0	2,600	1	2-Lamp T12	88	1	2 LAMP 4' 1	30	151	0	0.058		209 Family D	2,600	1	2 LAMP 4' 1	30
89	209 Family D	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		209 Family D	3,000	2	2 LAMP 2' 9	18
90	209 Family D	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		209 Family D	3,000	2	2 LAMP 2' 9	18
91	209 Family D	Justice Non-Jail	0	3,000	4	2-Lamp T8-U	62	4	2 LAMP 2' 9	18	528	0	0.176		209 Family D	3,000	4	2 LAMP 2' 9	18
92	209 Family D	Justice Non-Jail	0	3,000	9	4-Lamp T8 2	114	9	4 LAMP 4' 1	60	1,458	0	0.486		209 Family D	3,000	9	4 LAMP 4' 1	60
93	201 File Stor	Justice Non-Jail	0	2,600	2	3-Lamp T12	127	2	3 LAMP 4' 1	45	426	0	0.164		201 File Stor	2,600	2	3 LAMP 4' 1	45
94	Finance & Pu	Justice Non-Jail	0	3,000	6	3-Lamp T8 2	93	6	3 LAMP 4' 1	45	864	0	0.288		Finance & Pu	3,000	6	3 LAMP 4' 1	45
95	Finance & Pu	Justice Non-Jail	0	3,000	4	2-Lamp T12	88	4	2 LAMP 4' 1	30	696	0	0.232		Finance & Pu	3,000	4	2 LAMP 4' 1	30
96	Finance & Pu	Justice Non-Jail	0	3,000	1	3-Lamp T8 2	93	1	3 LAMP 4' 1	45	144	0	0.048		Finance & Pu	3,000	1	3 LAMP 4' 1	45
97	Finance & Pu	Justice Non-Jail	0	3,000	2	3-Lamp T8 2	93	2	3 LAMP 4' 1	45	288	0	0.096		Finance & Pu	3,000	2	3 LAMP 4' 1	45
98	Finance & Pu	Justice Non-Jail	0	3,000	2	3-Lamp T8 2	93	2	3 LAMP 4' 1	45	288	0	0.096		Finance & Pu	3,000	2	3 LAMP 4' 1	45
99	Finance & Pu	Justice Non-Jail	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9	18	396	0	0.132		Finance & Pu	3,000	3	2 LAMP 2' 9	18
100	Finance & Pu	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9	18	264	0	0.088		Finance & Pu	3,000	2	2 LAMP 2' 9	18
101	234 Office	Justice Non-Jail	0	3,000	6	3-Lamp T8 2	93	6	3 LAMP 4' 1	45	864	0	0.288		234 Office	3,000	6	3 LAMP 4' 1	45
102	235 Office	Justice Non-Jail	0	3,000	4	3-Lamp T8 2	93	4	3 LAMP 4' 1	45	576	0	0.192		235 Office	3,000	4	3 LAMP 4' 1	45
103	240 Administ	Justice Non-Jail	0	3,000	12	3-Lamp T8 2	93	12	3 LAMP 4' 1	45	1,728	0	0.576		240 Administ	3,000	12	3 LAMP 4' 1	45
104	237 Office	Justice Non-Jail	0	3,000	4	3-Lamp T8 2	93	4	3 LAMP 4' 1	45	576	0	0.192		237 Office	3,000	4	3 LAMP 4' 1	45
105	239 Office	Justice Non-Jail	0	3,000	2	3-Lamp T8 2	93	2	3 LAMP 4' 1	45	288	0	0.096		239 Office	3,000	2	3 LAMP 4' 1	45
106	Office 1 - Ac	Justice Non-Jail	0	3,000	6	3-Lamp T8 2	93	6	3 LAMP 4' 1	45	864	0	0.288		Office 1 - Ac	3,000	6	3 LAMP 4' 1	45
107	Office 2 - Ac	Justice Non-Jail	0	800	9	2-Lamp T8-U	62	9	2 LAMP 2' 9	18	317	0	0.396		Office 2 - Ac	800	9	2 LAMP 2' 9	18
108	Office 3 - Ac	Justice Non-Jail	0	3,000	4	2-Lamp T8-U	62	4	2 LAMP 2' 9	18	528	0	0.176		Office 3 - Ac	3,000	4	2 LAMP 2' 9	18

109	Office 4 - Ac	Justice Non-Jail	0	3,000	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	528	0	0.176		Office 4 - Ac	3,000	4	2 LAMP 2' 9\	18
110	Office 5 - Ac	Justice Non-Jail	0	3,000	4	2-Lamp T8-U	62	4	2 LAMP 2' 9\	18	528	0	0.176		Office 5 - Ac	3,000	4	2 LAMP 2' 9\	18
111	247 Break R	Justice Non-Jail	0	3,000	3	4-Lamp T12	176	3	4 LAMP 4' 1\	60	1,044	0	0.348		247 Break R	3,000	3	4 LAMP 4' 1\	60
112	Hallway Outs	Justice Non-Jail	0	4,000	7	2-Lamp T12-	72	7	2 LAMP 2' 9\	18	1,512	0	0.378		Hallway Outs	4,000	7	2 LAMP 2' 9\	18
113	221 Admin R	Justice Non-Jail	0	3,000	39	2-Lamp T8-U	62	39	2 LAMP 2' 9\	18	5,148	0	1.716		221 Admin R	3,000	39	2 LAMP 2' 9\	18
114	221 Admin -	Justice Non-Jail	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	396	0	0.132		221 Admin -	3,000	3	2 LAMP 2' 9\	18
115	221 Admin -	Justice Non-Jail	0	3,000	3	2-Lamp T8-U	62	3	2 LAMP 2' 9\	18	396	0	0.132		221 Admin -	3,000	3	2 LAMP 2' 9\	18
116	223 Storage	Justice Non-Jail	0	2,600	5	2-Lamp T8-U	62	5	2 LAMP 2' 9\	18	572	0	0.22		223 Storage	2,600	5	2 LAMP 2' 9\	18
117	221 Office	Justice Non-Jail	0	3,000	8	2-Lamp T8-U	62	8	2 LAMP 2' 9\	18	1,056	0	0.352		221 Office	3,000	8	2 LAMP 2' 9\	18
118	220 Admin R	Justice Non-Jail	0	3,000	20	3-Lamp T8 2	93	20	3 LAMP 4' 1\	45	2,880	0	0.96		220 Admin R	3,000	20	3 LAMP 4' 1\	45
119	220 Admin -	Justice Non-Jail	0	2,600	9	3-Lamp T8 2	93	9	3 LAMP 4' 1\	45	1,123	0	0.432		220 Admin -	2,600	9	3 LAMP 4' 1\	45
120	220 Admin -	Justice Non-Jail	0	2,000	1	2-Lamp T8 4	62	1	2 LAMP 4' 1\	30	64	0	0.032		220 Admin -	2,000	1	2 LAMP 4' 1\	30
121	220 Admin -	Justice Non-Jail	0	3,000	2	3-Lamp T12	127	2	3 LAMP 4' 1\	45	492	0	0.164		220 Admin -	3,000	2	3 LAMP 4' 1\	45
122	220 Admin -	Justice Non-Jail	0	3,000	2	3-Lamp T12	127	2	3 LAMP 4' 1\	45	492	0	0.164		220 Admin -	3,000	2	3 LAMP 4' 1\	45
123	Sherrif Rece	Justice Non-Jail	0	3,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,188	0	0.396		Sherrif Rece	3,000	9	2 LAMP 2' 9\	18
124	320 Office	Justice Non-Jail	0	3,000	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	792	0	0.264		320 Office	3,000	6	2 LAMP 2' 9\	18
125	318 Office	Justice Non-Jail	0	3,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,188	0	0.396		318 Office	3,000	9	2 LAMP 2' 9\	18
126	Office Hallwa	Justice Non-Jail	0	4,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,584	0	0.396		Office Hallwa	4,000	9	2 LAMP 2' 9\	18
127	315 Office	Justice Non-Jail	0	3,000	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	792	0	0.264		315 Office	3,000	6	2 LAMP 2' 9\	18
128	316 Office	Justice Non-Jail	0	3,000	2	2-Lamp T8-U	62	2	2 LAMP 2' 9\	18	264	0	0.088		316 Office	3,000	2	2 LAMP 2' 9\	18
129	314 Office	Justice Non-Jail	0	3,000	6	2-Lamp T8-U	62	6	2 LAMP 2' 9\	18	792	0	0.264		314 Office	3,000	6	2 LAMP 2' 9\	18
130	313 File Stor	Justice Non-Jail	0	2,600	4	3-Lamp T12	127	4	3 LAMP 4' 1\	45	853	0	0.328		313 File Stor	2,600	4	3 LAMP 4' 1\	45
131	Administrato	Justice Non-Jail	0	3,000	16	3-Lamp T12	127	16	3 LAMP 4' 1\	45	3,936	0	1.312		Administrato	3,000	16	3 LAMP 4' 1\	45
132	311 Office 1	Justice Non-Jail	0	3,000	2	3-Lamp T12	127	2	3 LAMP 4' 1\	45	492	0	0.164		311 Office 1	3,000	2	3 LAMP 4' 1\	45
133	311 Office 2	Justice Non-Jail	0	3,000	2	3-Lamp T12	127	2	3 LAMP 4' 1\	45	492	0	0.164		311 Office 2	3,000	2	3 LAMP 4' 1\	45
134	Office Area	Justice Non-Jail	0	3,000	28	2-Lamp T8-U	62	28	2 LAMP 2' 9\	18	3,696	0	1.232		Office Area	3,000	28	2 LAMP 2' 9\	18
135	Hallway By 3	Justice Non-Jail	0	4,000	7	2-Lamp T12-	72	7	2 LAMP 2' 9\	18	1,512	0	0.378		Hallway By 3	4,000	7	2 LAMP 2' 9\	18
136	302 Kitchen	Justice Non-Jail	0	3,000	5	2-Lamp T8-U	62	5	2 LAMP 2' 9\	18	660	0	0.22		302 Kitchen	3,000	5	2 LAMP 2' 9\	18
137	Hallway by E	Justice Non-Jail	0	4,000	11	2-Lamp T12-	72	11	2 LAMP 2' 9\	18	2,376	0	0.594		Hallway by E	4,000	11	2 LAMP 2' 9\	18
138	Walkway to E	Justice Non-Jail	0	4,000	23	1-Lamp T12	46	23	1 LAMP 4' 1\	15	2,852	0	0.713		Walkway to E	4,000	23	1 LAMP 4' 1\	15
139	Walkway to E	Justice Non-Jail	0	4,000	1	2-Lamp T12	88	1	2 LAMP 4' 1\	30	232	0	0.058		Walkway to E	4,000	1	2 LAMP 4' 1\	30
140	Walkway to E	Justice Non-Jail	0	4,000	37	1-Lamp T12	46	37	1 LAMP 4' 1\	15	4,588	0	1.147		Walkway to E	4,000	37	1 LAMP 4' 1\	15
141	Walkway to E	Justice Non-Jail	0	4,000	11	2-Lamp CFL	36	11	2 LAMP 13W	26	440	0	0.11		Walkway to E	4,000	11	2 LAMP 13W	26
142	Walkway to E	Justice Non-Jail	0	4,000	8	1-Lamp T12	46	8	1 LAMP 4' 1\	15	992	0	0.248		Walkway to E	4,000	8	1 LAMP 4' 1\	15
143	1.1 - 1st Floo	Justice Non-Jail	0	4,000	1	3-Lamp T8-U	92	1	3 LAMP 4' 1\	45	188	0	0.047		1.1 - 1st Floo	4,000	1	3 LAMP 4' 1\	45
144	1.1 - 1st Floo	Justice Non-Jail	0	4,000	2	1-Lamp CFL	18	2	1 LAMP 13W	13	40	0	0.01		1.1 - 1st Floo	4,000	2	1 LAMP 13W	13
145	1.2 - Hallway	Justice Non-Jail	0	4,000	9	3-Lamp T8-U	92	9	3 LAMP 4' 1\	45	1,692	0	0.423		1.2 - Hallway	4,000	9	3 LAMP 4' 1\	45
146	1.2 - Hallway	Justice Non-Jail	0	4,000	26	1-Lamp CFL	18	26	1 LAMP 13W	13	520	0	0.13		1.2 - Hallway	4,000	26	1 LAMP 13W	13
147	1.3 - 1st Floo	Justice Non-Jail	0	4,000	3	1-Lamp CFL	18	3	1 LAMP 13W	13	60	0	0.015		1.3 - 1st Floo	4,000	3	1 LAMP 13W	13
148	1.3 - 1st Floo	Justice Non-Jail	0	4,000	6	4-Lamp T8 2	114	6	4 LAMP 4' 1\	60	1,296	0	0.324		1.3 - 1st Floo	4,000	6	4 LAMP 4' 1\	60
149	1.3 - 1st Floo	Justice Non-Jail	0	4,000	1	1-Lamp T8 4	32	1	1 LAMP 4' 1\	15	68	0	0.017		1.3 - 1st Floo	4,000	1	1 LAMP 4' 1\	15
150	1.3 - 1st Floo	Justice Non-Jail	0	4,000	5	2-Lamp T8 4	62	5	2 LAMP 4' 1\	30	640	0	0.16		1.3 - 1st Floo	4,000	5	2 LAMP 4' 1\	30
151	1.2 - Hallway	Justice Non-Jail	0	4,000	2	2-Lamp T8 4	62	2	2 LAMP 4' 1\	30	256	0	0.064		1.2 - Hallway	4,000	2	2 LAMP 4' 1\	30
152	1.4 - Main En	Justice Non-Jail	0	1,000	6	4-Lamp CFL	72	6	4 LAMP 13W	52	120	0	0.12		1.4 - Main En	1,000	6	4 LAMP 13W	52
153	1.4 - Main En	Justice Non-Jail	0	1,000	10	1-Lamp CFL	0	10	1 LAMP 13W	13	(130)	0	-0.13		1.4 - Main En	1,000	10	1 LAMP 13W	13
154	1.2 - Hallway	Justice Non-Jail	0	4,000	3	1-Lamp CFL	18	3	1 LAMP 13W	13	60	0	0.015		1.2 - Hallway	4,000	3	1 LAMP 13W	13
155	Elevators	Justice Non-Jail	0	4,000	12	1-Lamp CFL	18	12	1 LAMP 13W	13	240	0	0.06		Elevators	4,000	12	1 LAMP 13W	13
156	216 - Closet	Justice Non-Jail	0	2,000	1	2-Lamp T8 4	62	1	2 LAMP 4' 1\	30	64	0	0.032		216 - Closet	2,000	1	2 LAMP 4' 1\	30
157	New Gerbal -	Justice Non-Jail	0	4,000	17	2-Lamp T8 4	62	17	2 LAMP 4' 1\	30	2,176	0	0.544		New Gerbal -	4,000	17	2 LAMP 4' 1\	30
158	New Gerbal -	Justice Non-Jail	0	4,000	22	1-Lamp T8 4	32	22	1 LAMP 4' 1\	15	1,496	0	0.374		New Gerbal -	4,000	22	1 LAMP 4' 1\	15
159	Stairwell by C	Justice Non-Jail	0	3,000	6	2-Lamp T8 4	62	6	2 LAMP 4' 1\	30	576	0	0.192		Stairwell by C	3,000	6	2 LAMP 4' 1\	30
160	Stairwell by C	Justice Non-Jail	0	3,000	1	2-Lamp T8-U	62	1	2 LAMP 2' 9\	18	132	0	0.044		Stairwell by C	3,000	1	2 LAMP 2' 9\	18
161	2nd Floor Ele	Justice Non-Jail	0	2,000	3	2-Lamp T8 4	62	3	2 LAMP 4' 1\	30	192	0	0.096		2nd Floor Ele	2,000	3	2 LAMP 4' 1\	30
162	2nd Floor Ha	Justice Non-Jail	0	4,000	16	2-Lamp T8-U	62	16	2 LAMP 2' 9\	18	2,816	0	0.704		2nd Floor Ha	4,000	16	2 LAMP 2' 9\	18
163	Lobby Outsic	Justice Non-Jail	0	4,000	15	2-Lamp T8-U	62	15	2 LAMP 2' 9\	18	2,640	0	0.66		Lobby Outsic	4,000	15	2 LAMP 2' 9\	18
164	Stairwell by 2	Justice Non-Jail	0	3,000	7	2-Lamp T8 4	62	7	2 LAMP 4' 1\	30	672	0	0.224		Stairwell by 2	3,000	7	2 LAMP 4' 1\	30
165	Hallway by 2	Justice Non-Jail	0	4,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,584	0	0.396		Hallway by 2	4,000	9	2 LAMP 2' 9\	18
166	Stairwell by 2	Justice Non-Jail	0	3,000	4	2-Lamp T8 4	62	4	2 LAMP 4' 1\	30	384	0	0.128		Stairwell by 2	3,000	4	2 LAMP 4' 1\	30
167	Hallway Outs	Justice Non-Jail	0	4,000	9	2-Lamp T8-U	62	9	2 LAMP 2' 9\	18	1,584	0	0.396		Hallway Outs	4,000	9	2 LAMP 2' 9\	18
168	Exterior	Justice Non-Jail	0	4,000	45	1-Lamp Exte	92	45	16W A21 LE	16	13,680	0	3.42		Exterior	4,000	45	16W A21 LE	16
169	Exterior	Justice Non-Jail	0	4,000	4	1-Lamp Exte	92	4	16W A21 LE	16	1,216	0	0.304		Exterior	4,000	4	16W A21 LE	16
170	Exterior	Justice Non-Jail	0	4,000	1	1-Lamp Exte	92	1	16W A21 LE	16	304	0	0.076		Exterior	4,000	1	16W A21 LE	16
171	Exterior	Justice Non-Jail	0	4,000	3	2-Lamp Exte	184	3	16W A21 LE	16	2,016	0	0.504		Exterior	4,000	3	16W A21 LE	16
172	Exterior	Justice Non-Jail	0	4,000	1	1-Lamp Exte	92	1	16W A21 LE	16	304	0	0.076		Exterior	4,000	1	16W A21 LE	16
end	insert above this line				0	Jan-00	0	0		0	0		0		insert above		0	Jan-00	0
	Option 3 Totals				**1,155**			**1,155**			**171,477**	**0**	**52**		**Option 3 Totals**		**1,155**		

LOCATION: New Jail — **LIGHTING RETROFIT** — **LOCATIO** New Jail

Address: 0 — **Address:** 0

City, State, Zip Code: 0 — **City, Stat**

Store Number 0 — **Store Nur**

	LOCATION:			EXISTING				PROPOSED			SAVINGS				EXISTING LIGHTING CONTROL				
Line Ref	LOCATION:	Floor	Print Area	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	KWH Saved	AC KWH Saved	KW Saved		LOCATION:	Existing Hrs. per Year	Lighting Qty	Existing Control Description	WATT / Fixture
1	1. Control Ve	New Jail	0	8760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		1. Control Ve	8,760	2	3 LAMP 4' 1\	45
2	2. Corridor -	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1\	30	1,121	0	0.128		2. Corridor -	8,760	4	2 LAMP 4' 1\	30
3	3. Sally Port	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		3. Sally Port	8,760	2	2 LAMP 4' 1\	30
4	4. 4B Day Ro	New Jail	0	8,760	11	28" 400w MH	465	11	125W LED F	125	32,762	0	3.74		4. 4B Day Ro	8,760	11	125W LED F	125
5	4. 4B Day Ro	New Jail	0	8,760	9	1x1, 2 Lamp,	52	9	2 LAMP 13W	26	2,050	0	0.234		4. 4B Day Ro	8,760	9	2 LAMP 13W	26
6	4. 4B Day Ro	New Jail	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1\	30	2,243	0	0.256		4. 4B Day Ro	8,760	8	2 LAMP 4' 1\	30
7	4. 4B Day Ro	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		4. 4B Day Ro	8,760	2	2 LAMP 4' 1\	30
8	5. 4B Cells (	New Jail	0	5,840	32	1x4, 2 Lamp,	62	32	2 LAMP 4' 1\	30	5,980	0	1.024		5. 4B Cells (	5,840	32	2 LAMP 4' 1\	30
9	6. Showers	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		6. Showers	8,760	2	2 LAMP 4' 1\	30
10	6. Showers	New Jail	0	8,760	2	1x1, 2 Lamp,	52	2	2 LAMP 13W	26	456	0	0.052		6. Showers	8,760	2	2 LAMP 13W	26

11	7. Rec Yard	New Jail	0	8,760	4	400w MH, R	465	4	125W LED F	125	11,914	0	1.36		7. Rec Yard	8,760	4	125W LED F	125
12	8. Multi Purp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		8. Multi Purp	8,760	4	2 LAMP 4' 1	30
13	9. Video Visit	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		9. Video Visit	8,760	2	2 LAMP 4' 1	30
14	10. Laundry	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		10. Laundry	8,760	1	2 LAMP 4' 1	30
15	11. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		11. Shower	8,760	2	2 LAMP 4' 1	30
16	12. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		12. Vestibule	8,760	1	2 LAMP 4' 1	30
17	13. Interview	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		13. Interview	8,760	2	2 LAMP 4' 1	30
18	14. Restroon	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		14. Restroon	8,760	1	2 LAMP 4' 1	30
19	15. Trash (2)	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		15. Trash (2)	8,760	2	2 LAMP 4' 1	30
20	16. Sally Por	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		16. Sally Por	8,760	2	2 LAMP 4' 1	30
21	17. 4A Day R	New Jail	0	8,760	6	28" 400w MH	465	6	125W LED F	125	17,870	0	2.04		17. 4A Day R	8,760	6	125W LED F	125
22	17. 4A Day R	New Jail	0	8,760	7	1x1, 2 Lamp,	52	7	2 LAMP 13W	26	1,594	0	0.182		17. 4A Day R	8,760	7	2 LAMP 13W	26
23	17. 4A Day R	New Jail	0	8,760	5	1x4, 2 Lamp,	62	5	2 LAMP 4' 1	30	1,402	0	0.16		17. 4A Day R	8,760	5	2 LAMP 4' 1	30
24	17. 4A Day R	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		17. 4A Day R	8,760	2	2 LAMP 4' 1	30
25	18. 4A Cells	New Jail	0	5,840	20	1x4, 2 Lamp,	62	20	2 LAMP 4' 1	30	3,738	0	0.64		18. 4A Cells	5,840	20	2 LAMP 4' 1	30
26	19. Rec Yard	New Jail	0	8,760	4	400w MH, R	465	4	125W LED F	125	11,914	0	1.36		19. Rec Yard	8,760	4	125W LED F	125
27	20. Multipurp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		20. Multipurp	8,760	4	2 LAMP 4' 1	30
28	21. Video Vis	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		21. Video Vis	8,760	2	2 LAMP 4' 1	30
29	22. Laundry	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		22. Laundry	8,760	1	2 LAMP 4' 1	30
30	23. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		23. Shower	8,760	1	2 LAMP 4' 1	30
31	23. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		23. Shower	8,760	1	2 LAMP 4' 1	30
32	24. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		24. Vestibule	8,760	1	2 LAMP 4' 1	30
33	25. Interview	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		25. Interview	8,760	1	2 LAMP 4' 1	30
34	26. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		26. Shower	8,760	2	2 LAMP 4' 1	30
35	27. OIC Offic	New Jail	0	8,760	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		27. OIC Offic	8,760	2	2 LAMP 4' 1	30
36	28. Stiarwell	New Jail	0	8,760	10	1x4, 2 Lamp,	62	10	2 LAMP 4' 1	30	2,803	0	0.32		28. Stiarwell	8,760	10	2 LAMP 4' 1	30
37	1. Control Ve	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		1. Control Ve	8,760	2	3 LAMP 4' 1	45
38	2. Corridor -	New Jail	0	8,760	7	1x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	1,962	0	0.224		2. Corridor -	8,760	7	2 LAMP 4' 1	30
39	3. Sally Port	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		3. Sally Port	8,760	2	2 LAMP 4' 1	30
40	4. 3B Day Ro	New Jail	0	8,760	11	28" 400w MH	465	11	125W LED F	125	32,762	0	3.74		4. 3B Day Ro	8,760	11	125W LED F	125
41	4. 3B Day Ro	New Jail	0	8,760	9	1x1, 2 Lamp,	52	9	2 LAMP 13W	26	2,050	0	0.234		4. 3B Day Ro	8,760	9	2 LAMP 13W	26
42	4. 3B Day Ro	New Jail	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	2,243	0	0.256		4. 3B Day Ro	8,760	8	2 LAMP 4' 1	30
43	4. 3B Day Ro	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		4. 3B Day Ro	8,760	2	2 LAMP 4' 1	30
44	5. 3B Cells (3	New Jail	0	5,840	32	1x4, 2 Lamp,	62	32	2 LAMP 4' 1	30	5,980	0	1.024		5. 3B Cells (3	5,840	32	2 LAMP 4' 1	30
45	6. Showers	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		6. Showers	8,760	2	2 LAMP 4' 1	30
46	6. Showers	New Jail	0	8,760	2	1x1, 2 Lamp,	52	2	2 LAMP 13W	26	456	0	0.052		6. Showers	8,760	2	2 LAMP 13W	26
47	7. Rec Yard	New Jail	0	8,760	4	400w MH, R	465	4	125W LED F	125	11,914	0	1.36		7. Rec Yard	8,760	4	125W LED F	125
48	8. Multi Purp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		8. Multi Purp	8,760	4	2 LAMP 4' 1	30
49	9. Video Visit	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		9. Video Visit	8,760	2	2 LAMP 4' 1	30
50	10. Laundry	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		10. Laundry	8,760	1	2 LAMP 4' 1	30
51	11. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		11. Shower	8,760	2	2 LAMP 4' 1	30
52	12. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		12. Vestibule	8,760	1	2 LAMP 4' 1	30
-136	13. Interview	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		13. Interview	8,760	2	2 LAMP 4' 1	30
-135	14. Restroon	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		14. Restroon	8,760	1	2 LAMP 4' 1	30
-134	15. Trash (2)	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		15. Trash (2)	8,760	2	2 LAMP 4' 1	30
-133	16. Sally Por	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		16. Sally Por	8,760	2	2 LAMP 4' 1	30
-132	17. 3A Day R	New Jail	0	8,760	6	28" 400w MH	465	6	125W LED F	125	17,870	0	2.04		17. 3A Day R	8,760	6	125W LED F	125
-131	17. 3A Day R	New Jail	0	8,760	7	1x1, 2 Lamp,	52	7	2 LAMP 13W	26	1,594	0	0.182		17. 3A Day R	8,760	7	2 LAMP 13W	26
-130	17. 3A Day R	New Jail	0	8,760	5	1x4, 2 Lamp,	62	5	2 LAMP 4' 1	30	1,402	0	0.16		17. 3A Day R	8,760	5	2 LAMP 4' 1	30
-129	17. 3A Day R	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		17. 3A Day R	8,760	2	2 LAMP 4' 1	30
-128	18. 3A Cells	New Jail	0	5,840	20	1x4, 2 Lamp,	62	20	2 LAMP 4' 1	30	3,738	0	0.64		18. 3A Cells	5,840	20	2 LAMP 4' 1	30
-127	19. Rec Yard	New Jail	0	8,760	4	400w MH, R	465	4	125W LED F	125	11,914	0	1.36		19. Rec Yard	8,760	4	125W LED F	125
-126	20. Multipurp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		20. Multipurp	8,760	4	2 LAMP 4' 1	30
-125	21. Video Vis	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		21. Video Vis	8,760	2	2 LAMP 4' 1	30
-124	22. Laundry	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		22. Laundry	8,760	1	2 LAMP 4' 1	30
-123	23. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		23. Shower	8,760	1	2 LAMP 4' 1	30
-122	23. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		23. Shower	8,760	1	2 LAMP 4' 1	30
-121	24. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		24. Vestibule	8,760	1	2 LAMP 4' 1	30
-120	25. Interview	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		25. Interview	8,760	1	2 LAMP 4' 1	30
-119	26. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		26. Shower	8,760	2	2 LAMP 4' 1	30
-118	27. Corridor	New Jail	0	8,760	12	1x4, 2 Lamp,	62	12	2 LAMP 4' 1	30	3,364	0	0.384		27. Corridor	8,760	12	2 LAMP 4' 1	30
-117	28. Sally Por	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		28. Sally Por	8,760	4	2 LAMP 4' 1	30
-116	29. Interview	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		29. Interview	8,760	1	2 LAMP 4' 1	30
-115	30. Interview	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		30. Interview	8,760	1	2 LAMP 4' 1	30
-114	31. Interview	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		31. Interview	8,760	2	2 LAMP 4' 1	30
-113	32. Restroon	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		32. Restroon	8,760	1	2 LAMP 4' 1	30
-112	33. Trash	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		33. Trash	8,760	1	2 LAMP 4' 1	30
-111	34. Day Roo	New Jail	0	8,760	7	1x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	1,962	0	0.224		34. Day Roo	8,760	7	2 LAMP 4' 1	30
-110	34. Day Roo	New Jail	0	8,760	8	28" 400w MH	465	8	125W LED F	125	23,827	0	2.72		34. Day Roo	8,760	8	125W LED F	125
-109	35. Rec Yard	New Jail	0	8,760	4	28" 400w MH	465	4	125W LED F	125	11,914	0	1.36		35. Rec Yard	8,760	4	125W LED F	125
-108	36. Multipurp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		36. Multipurp	8,760	4	2 LAMP 4' 1	30
-107	37. Showers	New Jail	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		37. Showers	8,760	3	2 LAMP 4' 1	30
-106	38. Cells (12	New Jail	0	5,840	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	187	0	0.032		38. Cells (12	5,840	1	2 LAMP 4' 1	30
-105	39. Day Roo	New Jail	0	8,760	7	1x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	1,962	0	0.224		39. Day Roo	8,760	7	2 LAMP 4' 1	30
-104	39. Day Roo	New Jail	0	8,760	8	28" 400w MH	465	8	125W LED F	125	23,827	0	2.72		39. Day Roo	8,760	8	125W LED F	125
-103	40. Rec Yard	New Jail	0	8,760	4	28" 400w MH	465	4	125W LED F	125	11,914	0	1.36		40. Rec Yard	8,760	4	125W LED F	125
-102	41. Multipurp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		41. Multipurp	8,760	4	2 LAMP 4' 1	30
-101	42. Showers	New Jail	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		42. Showers	8,760	3	2 LAMP 4' 1	30
-100	43. Cells (12	New Jail	0	5,840	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	187	0	0.032		43. Cells (12	5,840	1	2 LAMP 4' 1	30
-99	44. Corridor	New Jail	0	8,760	14	1x4, 2 Lamp,	62	14	2 LAMP 4' 1	30	3,924	0	0.448		44. Corridor	8,760	14	2 LAMP 4' 1	30
-98	45. Mech Ro	New Jail	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		45. Mech Ro	8,760	3	2 LAMP 4' 1	30
-97	46. Mech Ro	New Jail	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		46. Mech Ro	8,760	3	2 LAMP 4' 1	30
-96	47. Stairwell	New Jail	0	8,760	6	1x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	1,682	0	0.192		47. Stairwell	8,760	6	2 LAMP 4' 1	30
-95	48. Corridor	New Jail	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		48. Corridor	8,760	3	2 LAMP 4' 1	30

-94	49. Vestibule	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		49. Vestibule	8,760	2	2 LAMP 4' 1	30
-93	50. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		50. Vestibule	8,760	1	2 LAMP 4' 1	30
-92	51. Library	New Jail	0	3,000	8	2x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	768	0	0.256		51. Library	3,000	8	2 LAMP 4' 1	30
-91	52. Librarian	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		52. Librarian	2,600	2	2 LAMP 4' 1	30
-90	53. Storage	New Jail	0	2,600	1	2x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		53. Storage	2,600	1	2 LAMP 4' 1	30
-89	54. Custody	New Jail	0	8,760	8	2x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	2,243	0	0.256		54. Custody	8,760	8	2 LAMP 4' 1	30
-88	55. Capts Of	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		55. Capts Of	2,600	2	2 LAMP 4' 1	30
-87	56. Conf. Ro	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		56. Conf. Ro	2,600	2	2 LAMP 4' 1	30
-86	57. Capts Of	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		57. Capts Of	2,600	2	2 LAMP 4' 1	30
-85	58. Warden	New Jail	0	2,600	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	499	0	0.192		58. Warden	2,600	6	2 LAMP 4' 1	30
-84	59. Restroon	New Jail	0	2,600	3	2x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	250	0	0.096		59. Restroon	2,600	3	2 LAMP 4' 1	30
-83	1. Control Ve	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		1. Control Ve	8,760	2	3 LAMP 4' 1	45
-82	2. Corridor -	New Jail	0	8,760	7	1x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	1,962	0	0.224		2. Corridor -	8,760	7	2 LAMP 4' 1	30
-81	3. Sally Port	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		3. Sally Port	8,760	2	2 LAMP 4' 1	30
-80	4. MS Day R	New Jail	0	8,760	11	22" 175w MH	195	11	27W LED R8	27	16,188	0	1.848		4. MS Day R	8,760	11	27W LED R8	27
-79	5. 3B Cells (	New Jail	0	5,840	16	1x4, 2 Lamp,	62	16	2 LAMP 4' 1	30	2,990	0	0.512		5. 3B Cells (	5,840	16	2 LAMP 4' 1	30
-78	6. Showers	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		6. Showers	8,760	2	2 LAMP 4' 1	30
-77	6. Showers	New Jail	0	8,760	2	1x1, 2 Lamp,	52	2	2 LAMP 13W	26	456	0	0.052		6. Showers	8,760	2	2 LAMP 13W	26
-76	7. Rec Yard	New Jail	0	8,760	4	175w MH W	205	4	27W LED R8	27	6,237	0	0.712		7. Rec Yard	8,760	4	27W LED R8	27
-75	8. Multi Purp	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		8. Multi Purp	8,760	2	2 LAMP 4' 1	30
-74	12. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		12. Vestibule	8,760	1	2 LAMP 4' 1	30
-73	13. Interview	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		13. Interview	8,760	2	2 LAMP 4' 1	30
-72	14. Restroon	New Jail	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		14. Restroon	2,600	1	2 LAMP 4' 1	30
-71	15. Trash (2)	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		15. Trash (2)	8,760	2	2 LAMP 4' 1	30
-70	16. Sally Por	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		16. Sally Por	8,760	2	2 LAMP 4' 1	30
-69	17. MH Day	New Jail	0	8,760	6	22" 175w MH	195	6	27W LED R8	27	8,830	0	1.008		17. MH Day	8,760	6	27W LED R8	27
-68	18. 3A Cells	New Jail	0	5,840	10	1x4, 2 Lamp,	62	10	2 LAMP 4' 1	30	1,869	0	0.32		18. 3A Cells	5,840	10	2 LAMP 4' 1	30
-67	19. Rec Yard	New Jail	0	8,760	4	175w MH W	205	4	27W LED R8	27	6,237	0	0.712		19. Rec Yard	8,760	4	27W LED R8	27
-66	20. Multipurp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		20. Multipurp	8,760	4	2 LAMP 4' 1	30
-65	21. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		21. Shower	8,760	2	2 LAMP 4' 1	30
-64	22. Psych Of	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		22. Psych Of	8,760	2	2 LAMP 4' 1	30
-63	23. Elec. Roo	New Jail	0	1,200	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	77	0	0.064		23. Elec. Roo	1,200	2	2 LAMP 4' 1	30
-62	1. Corridor C	New Jail	0	8,760	7	1x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	1,962	0	0.224		1. Corridor C	8,760	7	2 LAMP 4' 1	30
-61	2. Elec. Roo	New Jail	0	1,200	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	38	0	0.032		2. Elec. Roo	1,200	1	2 LAMP 4' 1	30
-60	3. Dental Sal	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		3. Dental Sal	8,760	2	3 LAMP 4' 1	45
-59	4. Medical Sa	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		4. Medical Sa	8,760	2	3 LAMP 4' 1	45
-58	5. Dental Op	New Jail	0	8,760	6	2x4, 4 Lamp,	94	6	3 LAMP 4' 1	45	2,575	0	0.294		5. Dental Op	8,760	6	3 LAMP 4' 1	45
-57	6. Corridor	New Jail	0	8,760	4	2x4, 4 Lamp,	94	4	3 LAMP 4' 1	45	1,717	0	0.196		6. Corridor	8,760	4	3 LAMP 4' 1	45
-56	7. Triage	New Jail	0	8,760	6	2x4, 4 Lamp,	94	6	3 LAMP 4' 1	45	2,575	0	0.294		7. Triage	8,760	6	3 LAMP 4' 1	45
-55	8. Exam	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		8. Exam	8,760	2	3 LAMP 4' 1	45
-54	9. Xray	New Jail	0	8,760	4	2x4, 4 Lamp,	94	4	3 LAMP 4' 1	45	1,717	0	0.196		9. Xray	8,760	4	3 LAMP 4' 1	45
-53	10. Rubber R	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		10. Rubber R	8,760	2	2 LAMP 4' 1	30
-52	11. Vestibule	New Jail	0	8,760	1	2x4, 4 Lamp,	94	1	3 LAMP 4' 1	45	429	0	0.049		11. Vestibule	8,760	1	3 LAMP 4' 1	45
-51	12. Pharmac	New Jail	0	8,760	3	2x4, 4 Lamp,	94	3	3 LAMP 4' 1	45	1,288	0	0.147		12. Pharmac	8,760	3	3 LAMP 4' 1	45
-50	13. Head Nu	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		13. Head Nu	8,760	2	3 LAMP 4' 1	45
-49	14. Holding C	New Jail	0	8,760	12	1x4, 2 Lamp,	62	12	2 LAMP 4' 1	30	3,364	0	0.384		14. Holding C	8,760	12	2 LAMP 4' 1	30
-48	15. Storage	New Jail	0	1,200	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	118	0	0.098		15. Storage	1,200	2	3 LAMP 4' 1	45
-47	16. Control V	New Jail	0	8,760	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		16. Control V	8,760	3	2 LAMP 4' 1	30
-46	17. Corridor	New Jail	0	8,760	16	2x4, 4 Lamp,	94	16	3 LAMP 4' 1	45	6,868	0	0.784		17. Corridor	8,760	16	3 LAMP 4' 1	45
-45	18. Nurse St	New Jail	0	8,760	6	2x4, 4 Lamp,	94	6	3 LAMP 4' 1	45	2,575	0	0.294		18. Nurse St	8,760	6	3 LAMP 4' 1	45
-44	19. Clean Lir	New Jail	0	8,760	1	2x4, 4 Lamp,	94	1	3 LAMP 4' 1	45	429	0	0.049		19. Clean Lir	8,760	1	3 LAMP 4' 1	45
-43	20. Soiled Lir	New Jail	0	8,760	1	2x4, 4 Lamp,	94	1	3 LAMP 4' 1	45	429	0	0.049		20. Soiled Lir	8,760	1	3 LAMP 4' 1	45
-42	21. Restroon	New Jail	0	2,600	1	2x4, 4 Lamp,	94	1	3 LAMP 4' 1	45	127	0	0.049		21. Restroon	2,600	1	3 LAMP 4' 1	45
-41	22. Corridor	New Jail	0	8,760	8	2x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	2,243	0	0.256		22. Corridor	8,760	8	2 LAMP 4' 1	30
-40	23. Restroon	New Jail	0	2,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9	18	114	0	0.044		23. Restroon	2,600	1	2 LAMP 2' 9	18
-39	24. Restroon	New Jail	0	2,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9	18	114	0	0.044		24. Restroon	2,600	1	2 LAMP 2' 9	18
-38	25. Breakroo	New Jail	0	8,760	1	2x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	280	0	0.032		25. Breakroo	8,760	1	2 LAMP 4' 1	30
-37	26. Office	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		26. Office	2,600	2	2 LAMP 4' 1	30
-36	27. Work Are	New Jail	0	8,760	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	1,121	0	0.128		27. Work Are	8,760	4	2 LAMP 4' 1	30
-35	28. Office	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		28. Office	2,600	2	2 LAMP 4' 1	30
-34	29. Records	New Jail	0	8,760	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		29. Records	8,760	2	2 LAMP 4' 1	30
-33	30. Program	New Jail	0	2,600	3	2x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	250	0	0.096		30. Program	2,600	3	2 LAMP 4' 1	30
-32	31. Program	New Jail	0	2,600	12	2x4, 2 Lamp,	62	12	2 LAMP 4' 1	30	998	0	0.384		31. Program	2,600	12	2 LAMP 4' 1	30
-31	32. Office	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		32. Office	2,600	2	2 LAMP 4' 1	30
-30	33. Restroon	New Jail	0	2,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9	18	114	0	0.044		33. Restroon	2,600	1	2 LAMP 2' 9	18
-29	34. Sally Por	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		34. Sally Por	8,760	2	2 LAMP 4' 1	30
-28	35. Women's	New Jail	0	8,760	7	2x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	1,962	0	0.224		35. Women's	8,760	7	2 LAMP 4' 1	30
-27	36. Contracto	New Jail	0	8,760	5	2x4, 2 Lamp,	62	5	2 LAMP 4' 1	30	1,402	0	0.16		36. Contracto	8,760	5	2 LAMP 4' 1	30
-26	37. Cert Roo	New Jail	0	8,760	3	175w MH Re	195	3	27W LED R8	27	4,415	0	0.504		37. Cert Roo	8,760	3	27W LED R8	27
-25	38. Gym	New Jail	0	5,840	6	175w MH Re	195	6	27W LED R8	27	5,887	0	1.008		38. Gym	5,840	6	27W LED R8	27
-24	39. Gym	New Jail	0	5,840	6	175w MH Re	195	6	27W LED R8	27	5,887	0	1.008		39. Gym	5,840	6	27W LED R8	27
-23	40. Men's Lo	New Jail	0	8,760	14	2x4, 2 Lamp,	62	14	2 LAMP 4' 1	30	3,924	0	0.448		40. Men's Lo	8,760	14	2 LAMP 4' 1	30
-22	40. Men's Lo	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		40. Men's Lo	8,760	2	2 LAMP 4' 1	30
-21	41. Vestibule	New Jail	0	8,760	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	561	0	0.064		41. Vestibule	8,760	2	2 LAMP 4' 1	30
-20	42. Classroo	New Jail	0	2,600	9	2x4, 2 Lamp,	62	9	2 LAMP 4' 1	30	749	0	0.288		42. Classroo	2,600	9	2 LAMP 4' 1	30
-19	43. Break Ro	New Jail	0	8,760	3	2x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	841	0	0.096		43. Break Ro	8,760	3	2 LAMP 4' 1	30
-18	44. Office	New Jail	0	2,600	1	2x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		44. Office	2,600	1	2 LAMP 4' 1	30
-17	45. Office	New Jail	0	2,600	1	2x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		45. Office	2,600	1	2 LAMP 4' 1	30
-16	46. Office	New Jail	0	2,600	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	333	0	0.128		46. Office	2,600	4	2 LAMP 4' 1	30
-15	47. Office	New Jail	0	2,600	12	2x2, 2 Lamp,	62	12	2 LAMP 2' 9	18	1,373	0	0.528		47. Office	2,600	12	2 LAMP 2' 9	18
-14	48. Office	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9	18	458	0	0.176		48. Office	2,600	4	2 LAMP 2' 9	18
-13	49. Office	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9	18	458	0	0.176		49. Office	2,600	4	2 LAMP 2' 9	18
-12	50. Corridor	New Jail	0	8,760	16	2x4, 2 Lamp,	62	16	2 LAMP 4' 1	30	4,485	0	0.512		50. Corridor	8,760	16	2 LAMP 4' 1	30
-11	51. Phone Ve	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		51. Phone Ve	2,600	2	2 LAMP 4' 1	30

-10	52. Admin W	New Jail	0	2,600	6	2x2, 2 Lamp,	62	6	2 LAMP 2' 9\	18	686	0	0.264		52. Admin W	2,600	6	2 LAMP 2' 9\	18
-9	53. Office	New Jail	0	2,600	15	2x2, 2 Lamp,	62	15	2 LAMP 2' 9\	18	1,716	0	0.66		53. Office	2,600	15	2 LAMP 2' 9\	18
-8	54. Office	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	458	0	0.176		54. Office	2,600	4	2 LAMP 2' 9\	18
-7	55. Office	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	458	0	0.176		55. Office	2,600	4	2 LAMP 2' 9\	18
-6	56. Restroom	New Jail	0	2,600	2	2x2, 2 Lamp,	62	2	2 LAMP 2' 9\	18	229	0	0.088		56. Restroom	2,600	2	2 LAMP 2' 9\	18
-5	57. Office	New Jail	0	2,600	6	2x2, 2 Lamp,	62	6	2 LAMP 2' 9\	18	686	0	0.264		57. Office	2,600	6	2 LAMP 2' 9\	18
-4	58. Office	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	458	0	0.176		58. Office	2,600	4	2 LAMP 2' 9\	18
-3	59. Conf. Ro	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	458	0	0.176		59. Conf. Ro	2,600	4	2 LAMP 2' 9\	18
-2	60. Files	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	458	0	0.176		60. Files	2,600	4	2 LAMP 2' 9\	18
-1	61. Office	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	458	0	0.176		61. Office	2,600	4	2 LAMP 2' 9\	18
0	1. Control Ve	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		1. Control Ve	8,760	2	3 LAMP 4' 1\	45
1	2. Corridor	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1\	30	1,121	0	0.128		2. Corridor	8,760	4	2 LAMP 4' 1\	30
2	3. Sally Port	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		3. Sally Port	8,760	2	2 LAMP 4' 1\	30
3	4. Day Room	New Jail	0	8,760	11	28" 400w MH	465	11	125W LED F	125	32,762	0	3.74		4. Day Room	8,760	11	125W LED F	125
4	4. Day Room	New Jail	0	8,760	9	1x1, 2 Lamp,	52	9	2 LAMP 13W	26	2,050	0	0.234		4. Day Room	8,760	9	2 LAMP 13W	26
5	4. Day Room	New Jail	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1\	30	2,243	0	0.256		4. Day Room	8,760	8	2 LAMP 4' 1\	30
6	4. Day Room	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		4. Day Room	8,760	2	2 LAMP 4' 1\	30
7	5. Cells (32)	New Jail	0	5,840	32	1x4, 2 Lamp,	62	32	2 LAMP 4' 1\	30	5,980	0	1.024		5. Cells (32)	5,840	32	2 LAMP 4' 1\	30
8	6. Showers	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		6. Showers	8,760	2	2 LAMP 4' 1\	30
9	6. Showers	New Jail	0	8,760	2	1x1, 2 Lamp,	52	2	2 LAMP 13W	26	456	0	0.052		6. Showers	8,760	2	2 LAMP 13W	26
10	7. Rec Yard	New Jail	0	8,760	4	400w MH, R	465	4	125W LED F	125	11,914	0	1.36		7. Rec Yard	8,760	4	125W LED F	125
11	8. Multi Purp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1\	30	1,121	0	0.128		8. Multi Purp	8,760	4	2 LAMP 4' 1\	30
12	9. Video Visi	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		9. Video Visi	8,760	2	2 LAMP 4' 1\	30
13	10. Laundry	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		10. Laundry	8,760	1	2 LAMP 4' 1\	30
14	11. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		11. Shower	8,760	2	2 LAMP 4' 1\	30
15	12. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		12. Vestibule	8,760	1	2 LAMP 4' 1\	30
16	13. Interview	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		13. Interview	8,760	2	2 LAMP 4' 1\	30
17	14. Restroom	New Jail	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	83	0	0.032		14. Restroom	2,600	1	2 LAMP 4' 1\	30
18	15. Trash (2)	New Jail	0	1,200	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	77	0	0.064		15. Trash (2)	1,200	2	2 LAMP 4' 1\	30
19	16. Sally Por	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		16. Sally Por	8,760	2	2 LAMP 4' 1\	30
20	17. Day Roo	New Jail	0	8,760	6	28" 400w MH	465	6	125W LED F	125	17,870	0	2.04		17. Day Roo	8,760	6	125W LED F	125
21	17. Day Roo	New Jail	0	8,760	7	1x1, 2 Lamp,	52	7	2 LAMP 13W	26	1,594	0	0.182		17. Day Roo	8,760	7	2 LAMP 13W	26
22	17. Day Roo	New Jail	0	8,760	5	1x4, 2 Lamp,	62	5	2 LAMP 4' 1\	30	1,402	0	0.16		17. Day Roo	8,760	5	2 LAMP 4' 1\	30
23	17. Day Roo	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		17. Day Roo	8,760	2	2 LAMP 4' 1\	30
24	18. Cells (20	New Jail	0	5,840	20	1x4, 2 Lamp,	62	20	2 LAMP 4' 1\	30	3,738	0	0.64		18. Cells (20	5,840	20	2 LAMP 4' 1\	30
25	19. Rec Yard	New Jail	0	8,760	4	400w MH, R	465	4	125W LED F	125	11,914	0	1.36		19. Rec Yard	8,760	4	125W LED F	125
26	20. Multipurp	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1\	30	1,121	0	0.128		20. Multipurp	8,760	4	2 LAMP 4' 1\	30
27	21. Video Vis	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		21. Video Vis	8,760	2	2 LAMP 4' 1\	30
28	22. Laundry	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		22. Laundry	8,760	1	2 LAMP 4' 1\	30
29	23. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		23. Shower	8,760	1	2 LAMP 4' 1\	30
-33	23. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		23. Shower	8,760	1	2 LAMP 4' 1\	30
-32	24. Vestibule	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		24. Vestibule	8,760	1	2 LAMP 4' 1\	30
-31	25. Interview	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		25. Interview	8,760	1	2 LAMP 4' 1\	30
-30	26. Shower	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		26. Shower	8,760	2	2 LAMP 4' 1\	30
-29	27. Attourny	New Jail	0	8,760	14	2x4, 4 Lamp,	94	14	3 LAMP 4' 1\	45	6,009	0	0.686		27. Attourny	8,760	14	3 LAMP 4' 1\	45
-28	28. waiting	New Jail	0	8,760	4	2x4, 4 Lamp,	94	4	3 LAMP 4' 1\	45	1,717	0	0.196		28. waiting	8,760	4	3 LAMP 4' 1\	45
-27	29. Stair 7	New Jail	0	8,760	5	1x4, 2 Lamp,	62	5	2 LAMP 4' 1\	30	1,402	0	0.16		29. Stair 7	8,760	5	2 LAMP 4' 1\	30
-26	31. Vestibule	New Jail	0	8,760	1	1x4, 3 Lamp,	94	1	3 LAMP 4' 1\	45	429	0	0.049		31. Vestibule	8,760	1	3 LAMP 4' 1\	45
-25	32. IT	New Jail	0	8,760	3	1x4, 3 Lamp,	94	3	3 LAMP 4' 1\	45	1,288	0	0.147		32. IT	8,760	3	3 LAMP 4' 1\	45
-24	33. IT	New Jail	0	8,760	4	1x4, 3 Lamp,	94	4	3 LAMP 4' 1\	45	1,717	0	0.196		33. IT	8,760	4	3 LAMP 4' 1\	45
-23	34. IT	New Jail	0	8,760	2	1x4, 3 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		34. IT	8,760	2	3 LAMP 4' 1\	45
-22	1. Open Area	New Jail	0	8,760	20	2x4, 4 Lamp,	94	20	3 LAMP 4' 1\	45	8,585	0	0.98		1. Open Area	8,760	20	3 LAMP 4' 1\	45
-21	2. Cells	New Jail	0	8,760	20	1x4, 2 Lamp,	62	20	2 LAMP 4' 1\	30	5,606	0	0.64		2. Cells	8,760	20	2 LAMP 4' 1\	30
-20	3. Rubber Ro	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		3. Rubber Ro	8,760	1	2 LAMP 4' 1\	30
-19	4. Medical Sa	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		4. Medical Sa	8,760	2	3 LAMP 4' 1\	45
-18	5. Interview	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		5. Interview	8,760	2	2 LAMP 4' 1\	30
-17	6. Patdown	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		6. Patdown	8,760	2	2 LAMP 4' 1\	30
-16	7. Sally Port	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		7. Sally Port	8,760	2	3 LAMP 4' 1\	45
-15	8. Booking	New Jail	0	8,760	2	2x2, 2 Lamp,	62	2	2 LAMP 2' 9\	18	771	0	0.088		8. Booking	8,760	2	2 LAMP 2' 9\	18
-14	9. Vestibule	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		9. Vestibule	8,760	2	3 LAMP 4' 1\	45
-13	10. Sally Por	New Jail	0	8,760	3	2x4, 4 Lamp,	94	3	3 LAMP 4' 1\	45	1,288	0	0.147		10. Sally Por	8,760	3	3 LAMP 4' 1\	45
-12	11. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		11. Shower	8,760	1	2 LAMP 4' 1\	30
-11	12. Shower	New Jail	0	8,760	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1\	30	280	0	0.032		12. Shower	8,760	1	2 LAMP 4' 1\	30
-10	13. Corridor	New Jail	0	8,760	6	2x4, 4 Lamp,	94	6	3 LAMP 4' 1\	45	2,575	0	0.294		13. Corridor	8,760	6	3 LAMP 4' 1\	45
-9	14. Holding C	New Jail	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1\	30	2,243	0	0.256		14. Holding C	8,760	8	2 LAMP 4' 1\	30
-8	15. Office	New Jail	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	166	0	0.064		15. Office	2,600	2	2 LAMP 4' 1\	30
-7	16. Office	New Jail	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	166	0	0.064		16. Office	2,600	2	2 LAMP 4' 1\	30
-6	17. Tran	New Jail	0	2,600	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	255	0	0.098		17. Tran	2,600	2	3 LAMP 4' 1\	45
-5	18. Waiting	New Jail	0	8,760	1	2x4, 4 Lamp,	94	1	3 LAMP 4' 1\	45	429	0	0.049		18. Waiting	8,760	1	3 LAMP 4' 1\	45
-4	19. Restroon	New Jail	0	2,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9\	18	114	0	0.044		19. Restroon	2,600	1	2 LAMP 2' 9\	18
-3	20. Security	New Jail	0	8,760	3	2x2, 2 Lamp,	62	3	2 LAMP 2' 9\	18	1,156	0	0.132		20. Security	8,760	3	2 LAMP 2' 9\	18
-2	21. Sally Por	New Jail	0	8,760	3	2x4, 4 Lamp,	94	3	3 LAMP 4' 1\	45	1,288	0	0.147		21. Sally Por	8,760	3	3 LAMP 4' 1\	45
-1	22. Vehicular	New Jail	0	8,760	18	175w MH Re	195	18	27W LED R8	27	26,490	0	3.024		22. Vehicular	8,760	18	27W LED R8	27
0	23. Armory	New Jail	0	8,760	5	2x4, 4 Lamp,	114	5	4 LAMP 4' 1\	60	2,365	0	0.27		23. Armory	8,760	5	4 LAMP 4' 1\	60
1	24. Breakroo	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		24. Breakroo	8,760	2	2 LAMP 4' 1\	30
2	25. Changing	New Jail	0	8,760	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	561	0	0.064		25. Changing	8,760	2	2 LAMP 4' 1\	30
3	26. Corridor	New Jail	0	8,760	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1\	30	1,121	0	0.128		26. Corridor	8,760	4	2 LAMP 4' 1\	30
4	27. Property	New Jail	0	8,760	18	1x4, 3 Lamp,	94	18	3 LAMP 4' 1\	45	7,726	0	0.882		27. Property	8,760	18	3 LAMP 4' 1\	45
5	28. Corridor	New Jail	0	8,760	18	1x4, 2 Lamp,	62	18	2 LAMP 4' 1\	30	5,046	0	0.576		28. Corridor	8,760	18	2 LAMP 4' 1\	30
6	29. Office	New Jail	0	2,600	19	2x4, 2 Lamp,	62	19	2 LAMP 4' 1\	30	1,581	0	0.608		29. Office	2,600	19	2 LAMP 4' 1\	30
7	30. Alcove	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1\	45	858	0	0.098		30. Alcove	8,760	2	3 LAMP 4' 1\	45
8	31. Restroon	New Jail	0	2,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9\	18	114	0	0.044		31. Restroon	2,600	1	2 LAMP 2' 9\	18
9	32. Restroon	New Jail	0	2,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9\	18	114	0	0.044		32. Restroon	2,600	1	2 LAMP 2' 9\	18
10	33. Office	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1\	30	166	0	0.064		33. Office	2,600	2	2 LAMP 4' 1\	30

11	34. Office	New Jail	0	2,600	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		34. Office	2,600	2	2 LAMP 4' 1	30
12	35. Conferen	New Jail	0	2,600	9	2x2, 2 Lamp,	62	9	2 LAMP 2' 9	18	1,030	0	0.396		35. Conferen	2,600	9	2 LAMP 2' 9	18
13	36. Video Vis	New Jail	0	8,760	25	2x2, 2 Lamp,	62	25	2 LAMP 2' 9	18	9,636	0	1.1		36. Video Vis	8,760	25	2 LAMP 2' 9	18
14	37. Restroon	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9	18	458	0	0.176		37. Restroon	2,600	4	2 LAMP 2' 9	18
15	38. Restroon	New Jail	0	2,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9	18	458	0	0.176		38. Restroon	2,600	4	2 LAMP 2' 9	18
16	39. Staff Ent	New Jail	0	8,760	6	2x2, 2 Lamp,	62	6	2 LAMP 2' 9	18	2,313	0	0.264		39. Staff Ent	8,760	6	2 LAMP 2' 9	18
17	40. Vestibule	New Jail	0	8,760	8	2x2, 2 Lamp,	62	8	2 LAMP 2' 9	18	3,084	0	0.352		40. Vestibule	8,760	8	2 LAMP 2' 9	18
18	41. Vestibule	New Jail	0	8,760	6	2x2, 2 Lamp,	62	6	2 LAMP 2' 9	18	2,313	0	0.264		41. Vestibule	8,760	6	2 LAMP 2' 9	18
19	1. Gen Set	New Jail	0	1,200	7	1x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	269	0	0.224		1. Gen Set	1,200	7	2 LAMP 4' 1	30
20	2. Elec Roon	New Jail	0	8,760	11	1x4, 2 Lamp,	62	11	2 LAMP 4' 1	30	3,084	0	0.352		2. Elec Roon	8,760	11	2 LAMP 4' 1	30
21	3. Corridor	New Jail	0	8,760	14	2x4, 2 Lamp,	62	14	2 LAMP 4' 1	30	3,924	0	0.448		3. Corridor	8,760	14	2 LAMP 4' 1	30
22	4. Mech Roo	New Jail	0	8,760	11	1x4, 2 Lamp,	62	11	2 LAMP 4' 1	30	3,084	0	0.352		4. Mech Roo	8,760	11	2 LAMP 4' 1	30
23	5. Storage	New Jail	0	1,200	3	1x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	115	0	0.096		5. Storage	1,200	3	2 LAMP 4' 1	30
24	6. Storage	New Jail	0	1,200	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	77	0	0.064		6. Storage	1,200	2	2 LAMP 4' 1	30
25	7. Control Ve	New Jail	0	8,760	2	2x4, 4 Lamp,	94	2	3 LAMP 4' 1	45	858	0	0.098		7. Control Ve	8,760	2	3 LAMP 4' 1	45
26	8. Stair 4	New Jail	0	8,760	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	2,243	0	0.256		8. Stair 4	8,760	8	2 LAMP 4' 1	30
27	9. Corridor	New Jail	0	8,760	4	2x4, 4 Lamp,	94	4	3 LAMP 4' 1	45	1,717	0	0.196		9. Corridor	8,760	4	3 LAMP 4' 1	45
28	10. Sally Por	New Jail	0	8,760	6	2x4, 4 Lamp,	94	6	3 LAMP 4' 1	45	2,575	0	0.294		10. Sally Por	8,760	6	3 LAMP 4' 1	45
29	Exterior	New Jail	0	4,400	7	HYDREL 10(	120	7	16W LED R	16	3,203	0	0.728		Exterior	4,400	7	16W LED R	16
30	Exterior	New Jail	0	4,400	5	HYDREL 10(	120	5	16W LED R	16	2,288	0	0.52		Exterior	4,400	5	16W LED R	16
31	Exterior	New Jail	0	4,400	1	HYDREL 10(	120	1	16W LED R	16	458	0	0.104		Exterior	4,400	1	16W LED R	16
32	Exterior	New Jail	0	4,400	4	65w R30 Lan	65	4	12W BR30 L	12	933	0	0.212		Exterior	4,400	4	12W BR30 L	12
33	Exterior	New Jail	0	4,400	63	Recessed Do	285	63	45W LED R	45	66,528	0	15.12		Exterior	4,400	63	45W LED R	45
34	Exterior	New Jail	0	4,400	2	Square Pole	465	2	125W LED F	125	2,992	0	0.68		Exterior	4,400	2	125W LED F	125
55	Jan-00	Jan-00	0		0	Jan-00	0	0		0	0	0	0		0		0	Jan-00	0
56	Jan-00	Jan-00	0		0	Jan-00	0	0		0	0	0	0		0		0	Jan-00	0
	Formula Line	Jan-00	0		0	Jan-00	0	0		0	0	0	0		Formula Line		0	Jan-00	0
end	insert above this line				0	Jan-00	0	0		0	0		0		insert above		0	Jan-00	0
	Original Estimate Totals: New Jail							**1,403**			**748,912**	**0**	**102**		**Original Estimate Totals:**	**1,403**			
	Parking Garage														**Parking Garage**				
	Conf. Room	Parking Garage	0	3,000	20	Recessed Do	36	20	2 LAMP 11W	22	840	0	0.28		Conf. Room	3,000	20	2 LAMP 11W	22
	Corridor	Parking Garage	0	3,600	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	691	0	0.192		Corridor	3,600	6	2 LAMP 4' 1	30
	Corridor	Parking Garage	0	3,600	1	2x2, 2 Lamp,	62	1	2 LAMP 2' 9	18	158	0	0.044		Corridor	3,600	1	2 LAMP 2' 9	18
	Men's Restro	Parking Garage	0	2,600	1	100w R40 Fl	100	1	17W BR40 L	17	216	0	0.083		Men's Restro	2,600	1	17W BR40 L	17
	Men's Restro	Parking Garage	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		Men's Restro	2,600	1	2 LAMP 4' 1	30
	Women's Re	Parking Garage	0	2,600	1	100w R40 Fl	100	1	17W BR40 L	17	216	0	0.083		Women's Re	2,600	1	17W BR40 L	17
	Women's Re	Parking Garage	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		Women's Re	2,600	1	2 LAMP 4' 1	30
	Receptionist	Parking Garage	0	3,000	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	576	0	0.192		Receptionist	3,000	6	2 LAMP 4' 1	30
	Conf. Room	Parking Garage	0	3,000	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	192	0	0.064		Conf. Room	3,000	2	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	32	2x4, 2 Lamp,	62	32	2 LAMP 4' 1	30	3,072	0	1.024		Open Office	3,000	32	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	1	2x2, 2 Lamp,	34	1	2 LAMP 2' 9	18	48	0	0.016		Open Office	3,000	1	2 LAMP 2' 9	18
	Copy/Files	Parking Garage	0	3,000	3	2x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	288	0	0.096		Copy/Files	3,000	3	2 LAMP 4' 1	30
	Side Offices	Parking Garage	0	3,000	13	2x4, 2 Lamp,	62	13	2 LAMP 4' 1	30	1,248	0	0.416		Side Offices	3,000	13	2 LAMP 4' 1	30
	Conf. Room	Parking Garage	0	3,000	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	576	0	0.192		Conf. Room	3,000	6	2 LAMP 4' 1	30
	Kitchenette	Parking Garage	0	3,000	3	2x2, 2 Lamp,	34	3	2 LAMP 2' 9	18	144	0	0.048		Kitchenette	3,000	3	2 LAMP 2' 9	18
	Men's Restro	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Men's Restro	2,600	2	2 LAMP 4' 1	30
	Women's Re	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Women's Re	2,600	2	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	28	2x4, 2 Lamp,	62	28	2 LAMP 4' 1	30	2,688	0	0.896		Open Office	3,000	28	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	2	2x2, 2 Lamp,	34	2	2 LAMP 2' 9	18	96	0	0.032		Open Office	3,000	2	2 LAMP 2' 9	18
	Corner Office	Parking Garage	0	3,000	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	384	0	0.128		Corner Office	3,000	4	2 LAMP 4' 1	30
	File Room	Parking Garage	0	3,000	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	576	0	0.192		File Room	3,000	6	2 LAMP 4' 1	30
	File Room	Parking Garage	0	3,000	3	2x2, 2 Lamp,	34	3	2 LAMP 2' 9	18	144	0	0.048		File Room	3,000	3	2 LAMP 2' 9	18
	Open Office	Parking Garage	0	3,000	25	2x4, 2 Lamp,	62	25	2 LAMP 4' 1	30	2,400	0	0.8		Open Office	3,000	25	2 LAMP 4' 1	30
	Print Room	Parking Garage	0	3,000	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	192	0	0.064		Print Room	3,000	2	2 LAMP 4' 1	30
	Corner Office	Parking Garage	0	3,000	11	2x4, 2 Lamp,	62	11	2 LAMP 4' 1	30	1,056	0	0.352		Corner Office	3,000	11	2 LAMP 4' 1	30
	Lobby	Parking Garage	0	3,600	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	691	0	0.192		Lobby	3,600	6	2 LAMP 4' 1	30
	Lobby	Parking Garage	0	3,600	6	2x2, 2 Lamp,	34	6	2 LAMP 2' 9	18	346	0	0.096		Lobby	3,600	6	2 LAMP 2' 9	18
	Men's Restro	Parking Garage	0	2,600	1	100w R40 Fl	100	1	17W BR40 L	17	216	0	0.083		Men's Restro	2,600	1	17W BR40 L	17
	Men's Restro	Parking Garage	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		Men's Restro	2,600	1	2 LAMP 4' 1	30
	Women's Re	Parking Garage	0	2,600	1	100w R40 Fl	100	1	17W BR40 L	17	216	0	0.083		Women's Re	2,600	1	17W BR40 L	17
	Women's Re	Parking Garage	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		Women's Re	2,600	1	2 LAMP 4' 1	30
	Receptionist	Parking Garage	0	3,000	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	192	0	0.064		Receptionist	3,000	2	2 LAMP 4' 1	30
	Reception De	Parking Garage	0	3,000	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	576	0	0.192		Reception De	3,000	6	2 LAMP 4' 1	30
	Conf. Room	Parking Garage	0	3,000	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	384	0	0.128		Conf. Room	3,000	4	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	12	2x4, 2 Lamp,	62	12	2 LAMP 4' 1	30	1,152	0	0.384		Open Office	3,000	12	2 LAMP 4' 1	30
	Corridor	Parking Garage	0	3,600	7	2x4, 2 Lamp,	62	7	2 LAMP 4' 1	30	806	0	0.224		Corridor	3,600	7	2 LAMP 4' 1	30
	Side Offices	Parking Garage	0	3,000	13	2x4, 2 Lamp,	62	13	2 LAMP 4' 1	30	1,248	0	0.416		Side Offices	3,000	13	2 LAMP 4' 1	30
	Copy Room	Parking Garage	0	3,000	1	2x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	96	0	0.032		Copy Room	3,000	1	2 LAMP 4' 1	30
	Kitchenette	Parking Garage	0	3,000	3	2x2, 2 Lamp,	34	3	2 LAMP 2' 9	18	144	0	0.048		Kitchenette	3,000	3	2 LAMP 2' 9	18
	File Room	Parking Garage	0	3,000	3	2x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	288	0	0.096		File Room	3,000	3	2 LAMP 4' 1	30
	Men's Restro	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Men's Restro	2,600	2	2 LAMP 4' 1	30
	Women's Re	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Women's Re	2,600	2	2 LAMP 4' 1	30
	Training Roo	Parking Garage	0	3,000	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	768	0	0.256		Training Roo	3,000	8	2 LAMP 4' 1	30
	Cafeteria	Parking Garage	0	3,600	54	1x4, 2 Lamp,	62	54	2 LAMP 4' 1	30	6,221	0	1.728		Cafeteria	3,600	54	2 LAMP 4' 1	30
	Elevator Lobl	Parking Garage	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 1	45	176	0	0.049		Elevator Lobl	3,600	1	3 LAMP 4' 1	45
	Serving Line	Parking Garage	0	3,600	8	2x4, 3 Lamp,	94	8	3 LAMP 4' 1	45	1,411	0	0.392		Serving Line	3,600	8	3 LAMP 4' 1	45
	Kitchen	Parking Garage	0	3,600	5	2x4, 3 Lamp,	94	5	3 LAMP 4' 1	45	882	0	0.245		Kitchen	3,600	5	3 LAMP 4' 1	45
	Lobby	Parking Garage	0	3,600	5	2x4, 2 Lamp,	62	5	2 LAMP 4' 1	30	576	0	0.16		Lobby	3,600	5	2 LAMP 4' 1	30
	Lobby	Parking Garage	0	3,600	7	2x2, 2 Lamp,	34	7	2 LAMP 2' 9	18	403	0	0.112		Lobby	3,600	7	2 LAMP 2' 9	18
	Waiting Area	Parking Garage	0	3,000	5	2x4, 2 Lamp,	62	5	2 LAMP 4' 1	30	480	0	0.16		Waiting Area	3,000	5	2 LAMP 4' 1	30
	Reception	Parking Garage	0	3,000	5	2x4, 2 Lamp,	62	5	2 LAMP 4' 1	30	480	0	0.16		Reception	3,000	5	2 LAMP 4' 1	30
	Mapping	Parking Garage	0	3,000	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	576	0	0.192		Mapping	3,000	6	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	20	2x4, 2 Lamp,	62	20	2 LAMP 4' 1	30	1,920	0	0.64		Open Office	3,000	20	2 LAMP 4' 1	30
	Corridor	Parking Garage	0	3,600	8	2x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	922	0	0.256		Corridor	3,600	8	2 LAMP 4' 1	30

	Copy Area	Parking Garage	0	3,000	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 1	45	882	0	0.294		Copy Area	3,000	6	3 LAMP 4' 1	45
	Side Offices	Parking Garage	0	3,000	13	2x4, 2 Lamp,	62	13	2 LAMP 4' 1	30	1,248	0	0.416		Side Offices	3,000	13	2 LAMP 4' 1	30
	Conf. Room	Parking Garage	0	3,000	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	384	0	0.128		Conf. Room	3,000	4	2 LAMP 4' 1	30
	Men's Restro	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Men's Restro	2,600	2	2 LAMP 4' 1	30
	Women's Re	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Women's Re	2,600	2	2 LAMP 4' 1	30
	Kitchenette	Parking Garage	0	3,000	3	2x2, 2 Lamp,	34	3	2 LAMP 2' 9	18	144	0	0.048		Kitchenette	3,000	3	2 LAMP 2' 9	18
	Corridor	Parking Garage	0	3,600	3	2x4, 2 Lamp,	62	3	2 LAMP 4' 1	30	346	0	0.096		Corridor	3,600	3	2 LAMP 4' 1	30
	Side Offices	Parking Garage	0	3,000	13	2x4, 2 Lamp,	62	13	2 LAMP 4' 1	30	1,248	0	0.416		Side Offices	3,000	13	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	25	2x4, 2 Lamp,	62	25	2 LAMP 4' 1	30	2,400	0	0.8		Open Office	3,000	25	2 LAMP 4' 1	30
	Boiler Room	Parking Garage	0	4,000	8	1x4, 2 Lamp,	62	8	2 LAMP 4' 1	30	1,024	0	0.256		Boiler Room	4,000	8	2 LAMP 4' 1	30
	Boiler Room	Parking Garage	0	4,000	1	1x4, 2-Lamp,	72	1	2 LAMP 4' 1	30	168	0	0.042		Boiler Room	4,000	1	2 LAMP 4' 1	30
	Elevator Lobl	Parking Garage	0	3,600	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	691	0	0.192		Elevator Lobl	3,600	6	2 LAMP 4' 1	30
	Elevator Lobl	Parking Garage	0	3,600	1	2x2, 2 Lamp,	34	1	2 LAMP 2' 9	18	58	0	0.016		Elevator Lobl	3,600	1	2 LAMP 2' 9	18
	Reception	Parking Garage	0	3,000	13	2x4, 2 Lamp,	62	13	2 LAMP 4' 1	30	1,248	0	0.416		Reception	3,000	13	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	40	2x4, 2 Lamp,	62	40	2 LAMP 4' 1	30	3,840	0	1.28		Open Office	3,000	40	2 LAMP 4' 1	30
	Open Office	Parking Garage	0	3,000	6	2x2, 2 Lamp,	34	6	2 LAMP 2' 9	18	288	0	0.096		Open Office	3,000	6	2 LAMP 2' 9	18
	Assist Super	Parking Garage	0	3,000	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	192	0	0.064		Assist Super	3,000	2	2 LAMP 4' 1	30
	Assist Super	Parking Garage	0	3,000	2	2x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	192	0	0.064		Assist Super	3,000	2	2 LAMP 4' 1	30
	Side Offices	Parking Garage	0	3,000	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	384	0	0.128		Side Offices	3,000	4	2 LAMP 4' 1	30
	Men's Restro	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Men's Restro	2,600	2	2 LAMP 4' 1	30
	Women's Re	Parking Garage	0	2,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	166	0	0.064		Women's Re	2,600	2	2 LAMP 4' 1	30
	Kitchenette	Parking Garage	0	3,000	4	2x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	384	0	0.128		Kitchenette	3,000	4	2 LAMP 4' 1	30
	Conf. Room	Parking Garage	0	3,000	6	2x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	576	0	0.192		Conf. Room	3,000	6	2 LAMP 4' 1	30
	Storage Roo	Parking Garage	0	4,400	10	2x4, 2 Lamp,	62	10	2 LAMP 4' 1	30	1,408	0	0.32		Storage Roo	4,400	10	2 LAMP 4' 1	30
	Elevator Cars	Parking Garage	0	8,760	4	1x4, 2-Lamp,	72	4	2 LAMP 4' 1	30	1,472	0	0.168		Elevator Cars	8,760	4	2 LAMP 4' 1	30
	Stairwell A	Parking Garage	0	8,760	15	1x4, 2 Lamp,	62	15	2 LAMP 4' 1	30	4,205	0	0.48		Stairwell A	8,760	15	2 LAMP 4' 1	30
	Stairwell B	Parking Garage	0	8,760	13	1x4, 2 Lamp,	62	13	2 LAMP 4' 1	30	3,644	0	0.416		Stairwell B	8,760	13	2 LAMP 4' 1	30
	Penthouse	Parking Garage	0	1,800	7	1x4, 2-Lamp,	72	7	2 LAMP 4' 1	30	529	0	0.294		Penthouse	1,800	7	2 LAMP 4' 1	30
	Exterior	Parking Garage	0	4,400	25	Recessed Do	205	25	27W LED R6	27	19,580	0	4.45		Exterior	4,400	25	27W LED R6	27
	Exterior	Parking Garage	0	4,400	1	100w HPS W	120	1	16W LED R6	16	458	0	0.104		Exterior	4,400	1	16W LED R6	16
	Exterior	Parking Garage	0	8,760	476	175w MH Ar	195	476	27W LED R6	27	700,520	0	79.968		Exterior	8,760	476	27W LED R6	27
	Exterior	Parking Garage	0	8,760	176	150w HPS A	170	176	27W LED R6	27	220,472	0	25.168		Exterior	8,760	176	27W LED R6	27
	Exterior	Parking Garage	0	8,760	8	175w MH W	195	8	27W LED R6	27	11,773	0	1.344		Exterior	8,760	8	27W LED R6	27
	Exterior	Parking Garage	0	8,760	10	400w HPS "S	465	10	125W LED F	125	29,784	0	3.4		Exterior	8,760	10	125W LED F	125
	Exterior	Parking Garage	0	8,760	34	1x4, 2-Lamp,	72	34	2 LAMP 4' 1	30	12,509	0	1.428		Exterior	8,760	34	2 LAMP 4' 1	30
	Exterior	Parking Garage	0	8,760	24	100w HPS W	120	24	16W LED R6	16	21,865	0	2.496		Exterior	8,760	24	16W LED R6	16
	Jan-00	Jan-00	0		0	Jan-00	0	0		0	0	0	0		0		0	Jan-00	0
end	insert above this line				0	Jan-00	0	0		0	0		0		insert above		0	Jan-00	0
	Option 1 Totals				**1,356**			**1,356**			**1,082,550**	**0**	**137**		**Option 1 Totals**		**1,356**		
	Prosecutors														**Prosecutors**				
	Boiler Room	Prosecutors	0	4,000	9	1x4, 2 Lamp,	62	9	2 LAMP 4' 1	30	1,152	0	0.288		Boiler Room	4,000	9	2 LAMP 4' 1	30
	File Room 10	Prosecutors	0	3,600	15	2x4, 3 Lamp,	94	15	3 LAMP 4' 1	45	2,646	0	0.735		File Room 10	3,600	15	3 LAMP 4' 1	45
	Central Supp	Prosecutors	0	3,600	3	2x4, 3 Lamp,	94	3	3 LAMP 4' 1	45	529	0	0.147		Central Supp	3,600	3	3 LAMP 4' 1	45
	Interview Ro	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Interview Ro	3,600	2	3 LAMP 4' 1	45
	Elec Room 1	Prosecutors	0	1,200	6	1x4, 2 Lamp,	62	6	2 LAMP 4' 1	30	230	0	0.192		Elec Room 1	1,200	6	2 LAMP 4' 1	30
	Files Room 1	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 1	45	176	0	0.049		Files Room 1	3,600	1	3 LAMP 4' 1	45
	Files Room 1	Prosecutors	0	3,600	5	2x4, 3 Lamp,	94	5	3 LAMP 4' 1	45	882	0	0.245		Files Room 1	3,600	5	3 LAMP 4' 1	45
	Files Room 1	Prosecutors	0	3,600	4	1x4, 2 Lamp,	62	4	2 LAMP 4' 1	30	461	0	0.128		Files Room 1	3,600	4	2 LAMP 4' 1	30
	Major Crimes	Prosecutors	0	3,600	17	2x4, 3 Lamp,	94	17	3 LAMP 4' 1	45	2,999	0	0.833		Major Crimes	3,600	17	3 LAMP 4' 1	45
	Major Crimes	Prosecutors	0	3,600	12	1x4, 2 Lamp,	62	12	2 LAMP 4' 1	30	1,382	0	0.384		Major Crimes	3,600	12	2 LAMP 4' 1	30
	Interview Ro	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Interview Ro	3,600	2	3 LAMP 4' 1	45
	Capt. Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Capt. Office	3,600	2	3 LAMP 4' 1	45
	Lt Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Lt Office	3,600	2	3 LAMP 4' 1	45
	Lt Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Lt Office	3,600	2	3 LAMP 4' 1	45
	Men's Restro	Prosecutors	0	2,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	255	0	0.098		Men's Restro	2,600	2	3 LAMP 4' 1	45
	Men's Restro	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		Men's Restro	2,600	1	2 LAMP 4' 1	30
	Women's Re	Prosecutors	0	2,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	255	0	0.098		Women's Re	2,600	2	3 LAMP 4' 1	45
	Women's Re	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 1	30	83	0	0.032		Women's Re	2,600	1	2 LAMP 4' 1	30
	Assist. Prose	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 1	45	176	0	0.049		Assist. Prose	3,600	1	3 LAMP 4' 1	45
	Assist. Prose	Prosecutors	0	3,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	230	0	0.064		Assist. Prose	3,600	2	2 LAMP 4' 1	30
	Juvenile Unit	Prosecutors	0	3,600	14	2x4, 3 Lamp,	94	14	3 LAMP 4' 1	45	2,470	0	0.686		Juvenile Unit	3,600	14	3 LAMP 4' 1	45
	Office 112	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 1	45	176	0	0.049		Office 112	3,600	1	3 LAMP 4' 1	45
	Office 112	Prosecutors	0	3,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	230	0	0.064		Office 112	3,600	2	2 LAMP 4' 1	30
	Office 113	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 1	45	176	0	0.049		Office 113	3,600	1	3 LAMP 4' 1	45
	Office 113	Prosecutors	0	3,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	230	0	0.064		Office 113	3,600	2	2 LAMP 4' 1	30
	Office 114	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 1	45	176	0	0.049		Office 114	3,600	1	3 LAMP 4' 1	45
	Office 114	Prosecutors	0	3,600	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 1	30	230	0	0.064		Office 114	3,600	2	2 LAMP 4' 1	30
	Office 115	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Office 115	3,600	2	3 LAMP 4' 1	45
	Training 103	Prosecutors	0	3,600	9	2x4, 3 Lamp,	94	9	3 LAMP 4' 1	45	1,588	0	0.441		Training 103	3,600	9	3 LAMP 4' 1	45
	Office 102	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Office 102	3,600	2	3 LAMP 4' 1	45
	Corridor	Prosecutors	0	3,600	2	2x2, 2 Lamp,	34	2	2 LAMP 2' 9	18	115	0	0.032		Corridor	3,600	2	2 LAMP 2' 9	18
	Corridor	Prosecutors	0	3,600	5	2x4, 3 Lamp,	94	5	3 LAMP 4' 1	45	882	0	0.245		Corridor	3,600	5	3 LAMP 4' 1	45
	Corridor	Prosecutors	0	3,600	4	(2) 7w CFL E	16	4	NEW LED E	3	194	0	0.054		Corridor	3,600	4	NEW LED E	3
	Office 101	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Office 101	3,600	2	3 LAMP 4' 1	45
	101 Storage	Prosecutors	0	1,200	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	118	0	0.098		101 Storage	1,200	2	3 LAMP 4' 1	45
	Lobby	Prosecutors	0	3,600	4	250w MH Re	285	4	45W LED R6	45	3,456	0	0.96		Lobby	3,600	4	45W LED R6	45
	Lobby	Prosecutors	0	3,600	14	Recessed Do	36	14	2 LAMP 11W	22	706	0	0.196		Lobby	3,600	14	2 LAMP 11W	22
	Lobby	Prosecutors	0	3,600	1	(2) 7w CFL E	16	1	NEW LED E	3	49	0	0.0135		Lobby	3,600	1	NEW LED E	3
	1st Fl. - Rec	Prosecutors	0	3,600	11	Recessed Do	36	11	2 LAMP 11W	22	554	0	0.154		1st Fl. - Rec	3,600	11	2 LAMP 11W	22
	Duty Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Duty Office	3,600	2	3 LAMP 4' 1	45
	Office 229	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 1	45	353	0	0.098		Office 229	3,600	2	3 LAMP 4' 1	45
	Drug Court U	Prosecutors	0	3,600	3	2x4, 3 Lamp,	94	3	3 LAMP 4' 1	45	529	0	0.147		Drug Court U	3,600	3	3 LAMP 4' 1	45
	201 Side Offi	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 1	45	706	0	0.196		201 Side Offi	3,600	4	3 LAMP 4' 1	45
	Vestibule	Prosecutors	0	3,600	2	Recessed Do	36	2	2 LAMP 11W	22	101	0	0.028		Vestibule	3,600	2	2 LAMP 11W	22

	Receptionist	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Receptionist	3,600	2	3 LAMP 4' 19	45
	202 Open Of	Prosecutors	0	3,600	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 19	45	1,058	0	0.294		202 Open Of	3,600	6	3 LAMP 4' 19	45
	202 Side Offi	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		202 Side Offi	3,600	4	3 LAMP 4' 19	45
	Women's Re	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		Women's Re	2,600	1	2 LAMP 4' 19	30
	Men's Restro	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		Men's Restro	2,600	1	2 LAMP 4' 19	30
	Office 222	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Office 222	3,600	4	3 LAMP 4' 19	45
	Office 223	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 223	3,600	2	3 LAMP 4' 19	45
	Office 224	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 224	3,600	2	3 LAMP 4' 19	45
	Office 225	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 225	3,600	2	3 LAMP 4' 19	45
	Office 226	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 226	3,600	2	3 LAMP 4' 19	45
	Assist Pros (	Prosecutors	0	3,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	634	0	0.176		Assist Pros (	3,600	4	2 LAMP 2' 9\	18
	Lt Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Lt Office	3,600	2	3 LAMP 4' 19	45
	Corridor	Prosecutors	0	3,600	22	2x4, 3 Lamp,	94	22	3 LAMP 4' 19	45	3,881	0	1.078		Corridor	3,600	22	3 LAMP 4' 19	45
	Corridor	Prosecutors	0	3,600	4	2x2, 2 Lamp,	62	4	2 LAMP 2' 9\	18	634	0	0.176		Corridor	3,600	4	2 LAMP 2' 9\	18
	Corridor	Prosecutors	0	3,600	6	(2) 7w CFL E	16	6	NEW LED E	3	292	0	0.081		Corridor	3,600	6	NEW LED E	3
	Office 221	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 221	3,600	2	3 LAMP 4' 19	45
	Office 220	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 220	3,600	2	3 LAMP 4' 19	45
	Library	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Library	3,600	4	3 LAMP 4' 19	45
	Library	Prosecutors	0	3,600	8	Recessed Dc	36	8	2 LAMP 11W	22	403	0	0.112		Library	3,600	8	2 LAMP 11W	22
	Trial Section	Prosecutors	0	3,600	15	2x4, 3 Lamp,	94	15	3 LAMP 4' 19	45	2,646	0	0.735		Trial Section	3,600	15	3 LAMP 4' 19	45
	Conf. Room	Prosecutors	0	3,600	8	Recessed Dc	36	8	2 LAMP 11W	22	403	0	0.112		Conf. Room	3,600	8	2 LAMP 11W	22
	Office 203	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 203	3,600	2	3 LAMP 4' 19	45
	Office 204	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 204	3,600	2	3 LAMP 4' 19	45
	Office 205	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 205	3,600	2	3 LAMP 4' 19	45
	Office 207	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 207	3,600	2	3 LAMP 4' 19	45
	Office 208	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 208	3,600	2	3 LAMP 4' 19	45
	Office 209	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 209	3,600	2	3 LAMP 4' 19	45
	Office 210	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 210	3,600	2	3 LAMP 4' 19	45
	Copy/Kitcher	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Copy/Kitcher	3,600	2	3 LAMP 4' 19	45
	211A Open (	Prosecutors	0	3,600	12	2x4, 3 Lamp,	94	12	3 LAMP 4' 19	45	2,117	0	0.588		211A Open (	3,600	12	3 LAMP 4' 19	45
	211A Open (	Prosecutors	0	3,600	2	2x2, 2 Lamp,	62	2	2 LAMP 2' 9\	18	317	0	0.088		211A Open (	3,600	2	2 LAMP 2' 9\	18
	211A Open (	Prosecutors	0	3,600	1	(2) 7w CFL E	16	1	NEW LED E	3	49	0	0.0135		211A Open (	3,600	1	NEW LED E	3
	Ex. Assist Of	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Ex. Assist Of	3,600	2	3 LAMP 4' 19	45
	Admin Servic	Prosecutors	0	3,600	8	2x4, 3 Lamp,	94	8	3 LAMP 4' 19	45	1,411	0	0.392		Admin Servic	3,600	8	3 LAMP 4' 19	45
	Lt Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Lt Office	3,600	2	3 LAMP 4' 19	45
	Chief Office	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Chief Office	3,600	2	3 LAMP 4' 19	45
	Men's Restro	Prosecutors	0	2,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	255	0	0.098		Men's Restro	2,600	2	3 LAMP 4' 19	45
	Men's Restro	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		Men's Restro	2,600	1	2 LAMP 4' 19	30
	Women's Re	Prosecutors	0	2,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	255	0	0.098		Women's Re	2,600	2	3 LAMP 4' 19	45
	Women's Re	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		Women's Re	2,600	1	2 LAMP 4' 19	30
	219 Open Of	Prosecutors	0	3,600	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 19	45	1,058	0	0.294		219 Open Of	3,600	6	3 LAMP 4' 19	45
	219 Side Offi	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		219 Side Offi	3,600	4	3 LAMP 4' 19	45
	212A Office	Prosecutors	0	3,600	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 19	45	1,058	0	0.294		212A Office	3,600	6	3 LAMP 4' 19	45
	218 Office	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		218 Office	3,600	4	3 LAMP 4' 19	45
	212 Office	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		212 Office	3,600	4	3 LAMP 4' 19	45
	212 Side Offi	Prosecutors	0	3,600	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 19	45	1,058	0	0.294		212 Side Offi	3,600	6	3 LAMP 4' 19	45
	Vestibule	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 19	45	176	0	0.049		Vestibule	3,600	1	3 LAMP 4' 19	45
	Vestibule	Prosecutors	0	3,600	1	(2) 7w CFL E	16	1	NEW LED E	3	49	0	0.0135		Vestibule	3,600	1	NEW LED E	3
	Crim. Case U	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Crim. Case U	3,600	4	3 LAMP 4' 19	45
	Crim. Case U	Prosecutors	0	3,600	2	2x2, 2 Lamp,	62	2	2 LAMP 2' 9\	18	317	0	0.088		Crim. Case U	3,600	2	2 LAMP 2' 9\	18
	Office 213	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Office 213	3,600	4	3 LAMP 4' 19	45
	Office 214	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 214	3,600	2	3 LAMP 4' 19	45
	Office 215	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 215	3,600	2	3 LAMP 4' 19	45
	Open Office	Prosecutors	0	3,600	13	2x4, 3 Lamp,	94	13	3 LAMP 4' 19	45	2,293	0	0.637		Open Office	3,600	13	3 LAMP 4' 19	45
	Open Office	Prosecutors	0	3,600	2	2x2, 2 Lamp,	62	2	2 LAMP 2' 9\	18	317	0	0.088		Open Office	3,600	2	2 LAMP 2' 9\	18
	Copy	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 19	45	176	0	0.049		Copy	3,600	1	3 LAMP 4' 19	45
	Office 216	Prosecutors	0	3,600	6	2x4, 3 Lamp,	94	6	3 LAMP 4' 19	45	1,058	0	0.294		Office 216	3,600	6	3 LAMP 4' 19	45
	Office 217	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 217	3,600	2	3 LAMP 4' 19	45
	Office 301	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Office 301	3,600	4	3 LAMP 4' 19	45
	Office 307	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Office 307	3,600	4	3 LAMP 4' 19	45
	Reception/O	Prosecutors	0	3,600	18	Recessed Dc	36	18	2 LAMP 11W	22	907	0	0.252		Reception/O	3,600	18	2 LAMP 11W	22
	Receptionist	Prosecutors	0	3,600	4	Wall Sconce	26	4	2 LAMP 11W	22	58	0	0.016		Receptionist	3,600	4	2 LAMP 11W	22
	Conf Room 3	Prosecutors	0	3,600	8	Recessed Dc	36	8	2 LAMP 11W	22	403	0	0.112		Conf Room 3	3,600	8	2 LAMP 11W	22
	Roof Access	Prosecutors	0	1,200	2	1x4, 2 Lamp,	62	2	2 LAMP 4' 19	30	77	0	0.064		Roof Access	1,200	2	2 LAMP 4' 19	30
	Men's Restro	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		Men's Restro	2,600	1	2 LAMP 4' 19	30
	Women's Re	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		Women's Re	2,600	1	2 LAMP 4' 19	30
	Files	Prosecutors	0	3,600	1	2x4, 3 Lamp,	94	1	3 LAMP 4' 19	45	176	0	0.049		Files	3,600	1	3 LAMP 4' 19	45
	Office 303	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Office 303	3,600	4	3 LAMP 4' 19	45
	Office 303	Prosecutors	0	3,600	9	Recessed Dc	36	9	2 LAMP 11W	22	454	0	0.126		Office 303	3,600	9	2 LAMP 11W	22
	303 Restroo	Prosecutors	0	2,600	1	1x4, 2 Lamp,	62	1	2 LAMP 4' 19	30	83	0	0.032		303 Restroo	2,600	1	2 LAMP 4' 19	30
	Office 304	Prosecutors	0	3,600	2	2x4, 3 Lamp,	94	2	3 LAMP 4' 19	45	353	0	0.098		Office 304	3,600	2	3 LAMP 4' 19	45
	Office 305	Prosecutors	0	3,600	4	2x4, 3 Lamp,	94	4	3 LAMP 4' 19	45	706	0	0.196		Office 305	3,600	4	3 LAMP 4' 19	45
	Exterior	Prosecutors	0	4,400	12	100w HPS W	120	12	16W LED R8	16	5,491	0	1.248		Exterior	4,400	12	16W LED R8	16
	Exterior	Prosecutors	0	4,400	6	100w HPS W	120	6	16W LED R8	16	2,746	0	0.624		Exterior	4,400	6	16W LED R8	16
	Exterior	Prosecutors	0	4,400	1	250w HPS W	295	1	45W LED R8	45	1,100	0	0.25		Exterior	4,400	1	45W LED R8	45
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	Option 2 Totals				**491**			**491**			**78,247**	**0**	**22**		**Option 2 Totals**		**491**		

ENERGY SAVINGS PLAN

APPENDIX H

CHP INCENTIVE APPLICATION & SCHEMATICS

YOUR GOALS. OUR MISSION.

OCTY-00582

September 21, 2016
Via e-mail: jeffn@dcoenergy.com

Jeff Norton
Manager Project Development
DCO Energy Efficiency Division

RE: APPLICATION PACKAGE TO REQUEST FINANCIAL SUPPORT FOR CHP PROJECT FOR OCEAN COUNTY JUSTICE COMPLEX

Dear Jeff,

T&M Associates prepared the enclosed Combined Heat and Power application package on behalf of County of Ocean at its Justice Complex, New Jail and Courthouse Square facilities. All relevant and requested information has been provided in the completed CHP Workbook and Appendices.

Please note that the information included in the application documents, were for the purpose of preparing and submitting the incentive application to New Jersey Office of Clean Energy. The analysis may or may not be appropriate for DCO's economic evaluations that are part of the ESIP program, and we anticipate that DCO will be performing the necessary analysis as required for their ESIP initiative

Very truly yours,

T&M ASSOCIATES

Paul C. Sweetwood
VICE PRESIDENT

Enclosures
CC Joseph Myers, Ocean County Buildings and Grounds (via email)
Michele Henry, Ocean County Buildings and Grounds (via email)

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YOUR GOALS. OUR MISSION.

OCTY-00582

August 1, 2016
Via e-mail: **CHP@NJCleanEnergy.com**

Program Manager
Combined Heat and Power Program
New Jersey's Clean Energy Program

RE: APPLICATION PACKAGE TO REQUEST FINANCIAL SUPPORT FOR CHP PROJECT FOR OCEAN COUNTY JUSTICE COMPLEX

Dear Sir/Madam,

T&M Associates has prepared this Combined Heat and Power application package on behalf of County of Ocean at its Justice Complex, New Jail and Courthouse Square facilities.

Background

County of Ocean retained T&M Associates to perform a feasibility study for a Combined Heat and Power (CHP) system within the noted facilities. Pursuant to this study, it was determined that a CHP system interconnected to Justice Complex, New Jail and Courthouse Square would be technically and economically feasible.

System Description

The proposed system will be physically located along the West wall of New Jail building. The system will be tied into the facility electrical switchgear and will serve the electric loads of all three buildings since they will share a common electrical service from the utility company. The thermal output (waste heat) from the CHP will be utilized to serve the heating and hot water systems in both Justice Complex and New Jail buildings. The CHP waste heat will also be utilized in summer to serve chilled water demands within the Justice Complex building via an absorption chiller.

The selected CHP equipment meets or exceeds the emissions criteria as prescribed by NJ DEP as well as efficiency criteria as prescribed by NJ Clean Energy Program.

Please note that since this project is for a government entity, all construction will be subject to public bid. Once the approval is received on this incentive application, we will prepare bid and construction documents and receive bids as per the Local Public Contract's Law. After the bids are obtained and reviewed, we will be able to provide final information regarding Project Team as requested in Table 2 of the CHP Workbook. Similarly, the cost information provided in Table 16, Table 17 and Table 18 are based on quotations received from equipment vendors, standard resources (i.e. RS Means etc.), prior project cost data from our experience with similar installations and other estimating procedures. It is understood that the final values may be revised when bids are received from qualified contractors.

All relevant and requested information has been provided in the completed CHP Workbook and Appendices.

Closing

We welcome the opportunity to discuss the details of this project and look forward to receiving your approval.

Very truly yours,

T&M ASSOCIATES

Paul C. Sweetwood
VICE PRESIDENT

Enclosures
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COMBINED HEAT & POWER WORKBOOK

July 1, 2016 - June 30, 2017

Program Overview

The objective of the Combined Heat and Power / Waste Heat to Power program is to provide financial support in the form of incentives to support CHP and fuel cell projects serving governmental, commercial, institutional, and industrial electricity and/or natural gas customers in New Jersey. Program objectives are aligned with those of the State's Energy Master Plan ("EMP"), which includes:

- Increasing energy efficiency to reduce energy cost and consumption for consumers, businesses and government;
- Reducing reliance on imported energy;
- Improving the reliability of electricity and fuel supply, and the delivery of energy services;
- Reducing the impacts of energy production and use on the environment;

Program Funding

Program is budgeted through June 30, 2017. Applications are reviewed and funds committed on a first come, first serve basis provided all program requirements are met.

Eligibility

1) Applicant must be a New Jersey-based commercial and industrial (C&I) customer paying into the Societal Benefits Fund.

2) For all projects, any surplus power that may become available during the course of a given year may be sold through the PJM markets. Approval of this application by the NJ Clean Energy Program should not be construed as an approval for interconnection. Applicant is responsible for obtaining all interconnection agreements/approvals as per local, state and federal law.

3) Natural gas CHP, biopower CHP, mixed-fuel CHP (e.g. part biogas, part natural gas), and natural gas or hydrogen Fuel Cell equipment installed on the customer side of the utility meter are eligible. Applicant should be prepared to provide information in addition to that requested within this application, including but not limited to: availability of biogas, custom calculations showing adjusted energy content of fuel, manufacturer information specific to biogas, support for any added project cost due to biogas consumption, additional grants or incentives that the system may be eligible for, and emissions information.

4) Equipment must be new, commercially available, and permanently installed. Expansion of an existing system with new equipment is also eligible, however, only the incremental expansion is eligible for incentives.

5) The CHP or Fuel Cell system must achieve an annual system efficiency of at least 65% (Lower Heating Value – LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

6) Waste heat utilization systems or other mechanical recovery systems are required. Even though waste heat systems are produced with many configurations, they all perform the same task of capturing waste heat energy in the radiator or exhaust systems of a generator and delivering it to a heat load or cooling load. The captured energy is used in heating processes, such

7) In order to qualify for incentives, systems must operate a minimum of 5,000 full load equivalent hours per year (i.e. run at least 5,000 hours per year at full rated KW output). The Office of Clean Energy (OCE) may grant exceptions to this minimum operating hours requirement for critical facilities (as defined by the Office of Emergency Management and FEMA), provided the proposed system operates a minimum of 3,500 full load equivalent hours per year.

8) Incentives are paid per project per site. CHP projects will be evaluated on a per site basis and incentives awarded accordingly. Installations of multiple systems planned for the same site within a twelve (12) month period must be combined into a single project.

9) System shall have the ability to automatically disconnect from the utility in the event of substantial grid congestion, interruption, or failure to prevent back feeding to the grid. Note that systems are not required to continue to operate independent from the utility in the event of substantial grid congestion, interruption or failure.

10) CHP system must have a ten (10) year all-inclusive warranty. The warranty must cover the major components of the system eligible for the incentive, to protect against breakdown or degradation in electrical output of more than ten percent from the originally rated electrical output. The warranty shall cover the full cost of repair or replacement of defective components or systems, including coverage for labor costs to remove and reinstall defective components or systems. In the event the system warranty does not meet program requirement, customer must purchase an extended warranty or a ten (10) year maintenance/service contract. The cost of the ten (10) year warranty or service contract may be considered as part of the cost of the project.

11) Third party ownership (or leased equipment), such as those procured under Power Purchase Agreements, are permitted with the following provisions:

a) Projects are subject to ten (10) year warranty requirements as stated above.

b) Additionally, in order to ensure the equipment remains on site and is in operation for the term of the agreement, a binding agreement is required between the parties. A copy of this agreement shall be provided to the Program Manager prior to commitment of incentives. The agreement should state that the equipment could be transferred to new owners should the property be sold or otherwise have a buyout provision so the equipment remains on site and stays operational so the projected energy savings can accrue. The intent is to provide incentives for generating equipment, which is installed and functioning for the duration of its useful life. Under the Program, only permanently installed equipment is eligible for incentives and this must be physically demonstrable to the Program Manager, upon inspection, prior to receiving an incentive. This can be demonstrated by electrical, thermal and fuel connections in accordance with industry practices for permanently installed equipment and be secured to a permanent surface (e.g. foundation). Any indication of portability, including but not limited to temporary structures, quick disconnects, unsecured equipment, wheels, carrying handles, dolly, trailer or platform will deem the system ineligible.

c) The customer/applicant will be allowed to sign over the incentive to the third party owner. A valid project cost shall be demonstrated as part of the application in order to establish an appropriate incentive level.

d) All other program rules apply.

12) The following criteria may also apply during review of CHP project applications:

a) Environmental performance;
b) Projected system startup date;
c) Annual system utilization;
d) Alignment with programmatic goals;
e) Project clarity;
f) Facility's operation as an Emergency Management Center.

13) The following types of generating systems/equipment are not eligible for the program:

a) Any system that does not utilize waste heat;
b) Used, refurbished, temporary, pilot, demonstration, or portable equipment/systems;
c) Back-Up Generators - systems intended solely for emergency or back-up generation purposes;
d) Any system/equipment that uses diesel fuel, or other types of oil and coal for continuous operation;

Incentives

Eligible Technology	Size (Installed Rated Capacity)	Incentive ($/kW)	% of Total Cost Cap per project	$ Cap per project
Powered by non-renewable or renewable fuel source	≤500 kW	$2,000	30-40%*	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000	30%	$3 million
Gas Combustion Turbine	> 1 MW - 3 MW	$550		
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		

Footnotes:

(1) Incentives are tiered, which means the incentive levels vary based upon the installed rated capacity, as listed in the chart above. For example, a 4 MW CHP system would receive $2.00/watt for the first 500 kW, $1.00/watt for the second 500 kW, $0.55/watt for the next 2 MW and $0.35/watt for the last 1 MW (up to the caps listed).

(2) *The maximum incentive will be limited to 30% of total project. This cap will be increased to 40% where a cooling application is used or included with the CHP system (e.g. absorption chiller).

(3) Projects will be eligible for incentives shown above, not to exceed the lesser of % per project cap or $ per project cap.

Projects will receive program incentives in three partial payments. The first incentive will be paid upon proof of purchase of equipment. The second payment paid upon project installation and operation, including successful inspection. The remainder of the project incentive will be paid upon acceptance and confirmation the project is achieving the required performance thresholds based on twelve (12) months of operating data. The payment structure is summarized below:

Purchase	Installation	Acceptance of 12 months post-installation data
30%	**50%**	**20%**

Applicants will not be allowed to receive incentives for the installed generation equipment from other available SBC-funded programs.
BPU Board approval is required for all applications with total incentives greater than $500,000.

Visit our website: NJCleanEnergy.com/CHP

COMBINED HEAT & POWER WORKBOOK

July 1, 2016 - June 30, 2017

Instructions

1) Complete all **GREEN** tabs of this CHP workbook. Information in the Application Tab will be submitted online. All **WHITE** cells require user input; all cells highlighted in **GREY** will auto-populate. Please make sure to read any instructions within each tab for additional guidance.

2) Read all 'Terms & Conditions', including Installation Requirements and Code Requirements.

3) Submit the following to the Program Manager:

- o This Application workbook;
- o All appendices as outlined in the 'Appendices' tab;
- o Completed and Signed 'Signature Page';
- o W-9 form for payee;
- o Any supplementary documentation supporting the information entered into this Workbook.

All submittals should be emailed to: CHP@NJCleanEnergy.com

4) Once the Application package has been reviewed and approved, the Program Manager will forward Applicant an Approval Letter with the committed incentive amount. To be eligible to receive a program incentive, Applicant must receive an Approval Letter from the Program Manager prior to equipment installation. A pre-inspection will be conducted prior to issuance of the approval letter.

5) Applicant must purchase a qualifying system and have it installed according to program requirements within eighteen (18) months of the date listed on the Approval Letter. Projects are expected to be designed and proposed as feasible, viable projects that can be permitted in all relevant jurisdictions. The Program, however, recognizes that some project changes may be required in order to be consistent with the results of any environmental assessment, DEP, or other local state or federal permitting requirement, or events that are unforeseen by the proposals. The Program Manager must be notified in advance of any proposed change in a project while the application is pending or active for that project. The Program Manager reserves the right to disqualify a project if changes impact Applicant eligibility. Requests for extensions may be granted by the Program Manager for up to twelve (12) months so long as applicant can demonstrate proof of significant project advancement.

6) Incentives will be processed by the Program Manager and paid as follows: Thirty percent (30%) of the incentive upon proof of equipment purchase; Fifty percent (50%) upon project completion and verification of installation by Program Manager; Remainder twenty percent (20%) upon acceptance and confirmation the project is achieving the required performance thresholds based on twelve (12) months of consecutive operating data within twenty-four (24) months of operation.

7) In order to receive the first installment of the incentive, the Applicant (or Contractor) must submit the following to the Program Manager: a) proof of purchase (invoice); b) and tax clearance certificate; c) signed copy of Customer-Developer Contract.

8) In order to receive the second installment of the incentive, the Applicant (or Contractor) must submit the following to the Program Manager: a) an updated Application Workbook with post-installation data; b) proof of additional purchases (invoice); c) proof of warranty; d) a copy of the Electrical Code Inspection Certificate; e) completed Interconnection Application approved by the utility company; f) and updated tax clearance certificate. A post-inspection will be conducted at this time.

9) In order to receive the final installment of the incentive, Applicant must provide to the Program Manager: a) 12 months of operational data demonstrating proposed and/or minimum efficiency was achieved and annual generated kWhs are within 20% of that stated in the approved Application. This shall be done by implementing appropriate metering as part of the system installation. Data collected should include, but is not limited to, fuel input (MMBtu), electrical output (kWh, MMBtu), recoverable and utilized thermal output (MMBtu). A detailed metering plan shall be included within the feasibility analysis; b) an updated tax clearance certificate. If the review of the twelve (12) months of operational data demonstrates the equipment is not achieving the required level of efficiency and/or generation, the applicant may submit a request to the Program Manager for an extension. Requests for extensions may be granted by the Program Manager for up to twelve (12) months (two, six (6) month extensions). These extensions are in addition to any extension granted during project construction, as discussed above. Failure to meet required performance thresholds may result in forfeit of final incentive.

10) Applicants will be encouraged to submit operational data to demonstrate system performance for each year the system is in operation. This data will aid the New Jersey Board of Public Utilities in various efforts related to supporting CHP development within the state. No additional incentives will be available for this effort.

11) All submittals must be signed by a New Jersey Professional Engineer (PE) certifying that the information is accurate to the best of their knowledge (see Signature Page).

12) Questions related to this Workbook or for general Technical Assistance should be submitted to: CHP@NJCleanEnergy.com

COMBINED HEAT & POWER WORKBOOK

July 1, 2016 - June 30, 2017

Terms and Conditions

1) To receive a program incentive, Applicant must agree to an inspection by the Program Manager, or its representatives.

2) The New Jersey Board of Public Utilities reserves the right to modify or withdraw this program. Program procedures and incentive levels are subject to change or cancellation without notice. Approved projects will be honored under the terms stated in the Approval Letter.

3) The Program Manager and Program Administrator do not warrant the performance of installed equipment, and/or services rendered as part of this program, either expressly or implicitly. No warranties or representations of any kind, whether statutory, expressed, or implied, including, without limitations, warranties of merchantability or fitness for a particular purpose regarding equipment or services provided by a manufacturer or vendor. Contact your vendor/services provided for details regarding performance and warranties.

4) The Program Manager and Program Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

5) The Program Manager will not be responsible for any tax liability that may be imposed on any Applicant as a result of the payment of program incentives. All Applicants must supply their Federal Tax Identification number or social security number on the application form in addition to providing a copy of their W-9 form as part of the application package in order to receive a program incentive.

6) By virtue of participating in this Program, Applicants agree to waive any and all claims or damages against the Program Manager or Program Administrator, except the receipt of the program incentive. Applicants agree that the Program Manager's and Program Administrator's liability, in connection with this Program, is limited to paying the program incentive specified. Under no circumstances shall the Program Manager, its representatives, subcontractors, or the Program Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Program Manager under this Program shall be individual, and not joint and/or several.

7) All projects must be in compliance with all applicable laws. Applicants must not have any unresolved environmental violations, past due unresolved financial obligations to the State of New Jersey, and must be current in all payment of all state and local taxes at time of application submittal and through the entire duration of project funding received by Applicant.

8) Approval of this application by the NJ Clean Energy Program should not be construed as an approval for interconnection. Applicant is responsible for obtaining all interconnection agreements/approvals as per local, state and federal law.

9) Construction projects will be subject to prevailing wage requirements pursuant to P.L. 2009, c. 203, which amends P.L. 2009, c. 89, as well as the prevailing wage regulations promulgated by the New Jersey Department of Labor and Workforce Development pursuant to P.L. 1963 c. 150 as amended, and N.J.A.C. 17:27-1.1 et seq. and Affirmative Action rules. This law applies to contracts greater than $15,444.

10) Applications received will be reviewed only by the Program Manager, Program Administrator Coordinator, New Jersey Board of Public Utilities, and by selected external reviewers. All proposals submitted will be subject to requests for disclosure, including but not limited to, a request pursuant to the Open Public Records Act ("OPRA"), N.J.S.A. 47:1A-1 et seq. If the applicant believes that information contained in its proposal merits confidential treatment pursuant to OPRA, any such purportedly confidential information submitted shall be specifically identified and marked by the Applicant and submitted to the Board's Custodian in compliance with the Board's regulations at N.J.A.C. 14:1-12 et seq.

Installation Requirements

In addition to the Eligibility Requirements listed under 'Introduction', the following Installation Requirements apply:

1) The Applicant must provide an expected completion date. In the event of program funding limitations, the expected completion date will be used as an award criterion. The Applicant should submit documentation from manufacturers and contractors which state the expected equipment delivery and installation dates.

2) Incentives are intended to enhance the affordability of clean energy generation systems. Systems should be installed according to manufacturer's instructions. For systems installed inconsistent with such requirements, the Rated System Output may be de-rated.

3) Installation must comply with the host utility's interconnection and protection requirements, which are available from the respective electric utility. These include Operation/Disconnection Procedures, Liability/Indemnity and Insurance Requirements according to the size of the project. For information on Net Metering, please contact your electric utility.

4) The installation must comply with provisions of the latest edition of these standards, as appropriate: NFPA 853 – Stationary Fuel Cell, and all codes governing the installation of Combined Heat and Power equipment; NFPA 70 National Electrical Code (NEC), Power Plants, IEEE 519 – Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems; ANSI Z21.83-1998 Fuel Cell Power Plants, and input and output protection functions should be in compliance with ANSI C37.2 Device Function Number specifications.

5) All drawing shall be stamped and sealed by a New Jersey licensed Professional Engineer.

6) The system should be equipped with the following capabilities, indicators and/or controls:

- o On/off control on site;
- o Operating mode setting indication - parallel vs. stand-alone;
- o AC & DC overcurrent protection or equivalent;
- o Operating status indication;
- o Remote control and data acquisition capable;
- o Electric load-following capable.

7) All equipment must be UL listed/certified.

8) Warning labels must be posted on the control panels and junction boxes indicating that the circuits are energized by an alternate power source independent of utility-provided power.

9) All interconnecting wires must be copper. (Some provisions may be made for aluminum wiring; approval must be received from electric utility engineering departments prior to acceptance.)

10) All wiring splices must be contained in UL listed junction boxes.

11) Operating instructions must be posted on or near the system, or on file with the facility's operation and maintenance documents.

Proposed changes to the requirements will be considered, but they must be documented by the Applicant or Installation Contractor and approved by the New Jersey Board of Public Utilities' Office of Clean Energy. These requirements are not all-encompassing and are intended only to address certain minimum safety and efficiency standards.

Code Requirements

1) The installation must comply with the provisions of the latest edition of NFPA 70 National Electrical Code (NEC) and all other applicable local, state, and federal codes or practices.

2) All required permits must be properly obtained and posted.

3) All required inspections must be performed (i.e., Electrical/NEC, Local Building Codes Enforcement Office, etc.).

4) In order to ensure compliance with provisions of the NEC, an inspection by a state-licensed electrical inspector is mandatory.

APPENDICES

Include the following supplemental Appendices with your application submittal:

Appendix A: Map of Site

Map or overhead image of site indicating proposed equipment location, tie-in to existing building systems, and point of connection with the utility system.

Appendix B: Energy Balance

The energy balance must be applied to a schematic of the system showing all major components, including the uses for the recovered heat. Annual totals for each energy input/output must be shown along with maximum, minimum, and average instantaneous values. Flow volumes, e.g., GPM, PPH, CFM including temperatures of each waste heat transfer fluid/exhaust gases, etc., and associated heat sink must also be indicated.

Appendix C: Specification Sheets

Manufacturer specification sheets for CHP/Fuel Cell equipment, as well as ancillary equipment such as absorption chiller.

Appendix D: Utility Bills

Twelve (12) months of utility bills for all accounts and dates listed in 'Utility Information' tab. Provide actual utility bills to support all inputs, or a utility summary produced directly from the utility. Investor-owned utility bills are required; third party bills are optional. Multifamily properties must included tenant usage.

Appendix E: Heating & Cooling Load Calculations

Please provide calculations supporting the thermal output data entered into Table 9 of the 'Proposed System Performance' tab. For example, if planning to use an absorption chiller to offset cooling load, provide cooling load calculations.

Appendix F: Warranty and/or Service Contract

Copy of warranty and/or service contract which must be for at least a ten (10) year period and must cover all CHP equipment, as well as ancillary equipment such as absorption chiller, controls, etc. Unsigned copy may be provided with application. Signed/executed copy must be provided at installation (request for Incentive #2).

Appendix G: Any other pertinent information in support of the information provided in this application.

Additional information may be requested by the Program Manager during application review.

COMBINED HEAT & POWER WORKBOOK
July 1, 2016 - June 30, 2017

Customer Information

Electric Utility	JCP&L	**If Other**	
Gas Utility	New Jersey Natural Gas	**If Other**	

Electric Utility Account Number (s)	**Gas Utility Account Number (s)**
100017910215; 100017422278; 100076240165	194510004712; 194611193014

Company	**Federal ID/SSN**	**NAICS Code**
COUNTY OF OCEAN	21-6000954	921190

First Name	**Last Name**	**Title**
Michael	Fiure	Director, Department of Management and Budget

Phone Number	**Email Address**
732-929-2099	Mfiure@co.ocean.nj.us

Installation Address	**City**	**State**	**Zip**
120 Hooper Avenue	Toms River	NJ	08754

Mailing Address (if different from above)	**City**	**State**	**Zip**
101 Hooper Avenue	Toms River	NJ	08754

Incentive Recipient (if incentive check is to be issued to a company other than above, mail check to)*

Company	**Federal ID/SSN**

First Name	**Last Name**	**Title**

Phone Number	**Email Address**

Mailing Address	**City**	**State**	**Zip**

***Submit a W9 form for this entity.**

Contractor/Installer/Design Professional

Company	**Federal ID/SSN**
T&M Associates	22-1806708

First Name	**Last Name**	**Title**
Paul	Sweetwood	Vice President

Phone Number	**Email Address**
732-671-6400	psweetwood@tandmassociates.com

Mailing Address	**City**	**State**	**Zip**
11 Tindall Rd	Middletown	NJ	07748

New Jersey's cleanenergy program

COMBINED HEAT & POWER WORKBOOK

July 1, 2016 - June 30, 2017

BPU

Application Checklist

Before submitting your application, please make sure you have signed in the space below and completed the following items:

Project Name:	Ocean County Justice Complex Microgrid CHP

Application workbook has been filled out in its entirety, including Appendices	☑
W-9 form for the payee is included	☑
Terms & Conditions have been read and acknowledged by all parties, including customer and contractor	☑
Signature Page signed below by both customer, contractor, as well as a Professional Engineer licensed in the state of New Jersey	☑

ACKNOWLEDGEMENT – The undersigned warrants, certifies and represents that as part of the design study requirement; 1) the information provided in this entire application is true and correct to the best of my knowledge; 2) the Contractor/ Installer will explain and provide manuals related to the system operation and maintenance to the customer (Applicant); and 3) the installation will meet all of *New Jersey's Clean Energy Program* requirements. I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Program Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the Combined Heat and Power program, including the release of electric and natural gas utility billing information, as well as make available to the public non-sensitive information. I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of *New Jersey's Clean Energy Program*. This arrangement supersedes all other communications and representations.

Customer/Applicant
(Must be a person authorized to execute contracts)

Print Name, Title: MICHAEL J. FIURE
DIRECTOR

Signature: _____

Date: 8/1/16

Contractor/Installer

Print Name, Title: _____

Signature: _____

Date: _____

Professional Engineer (N.J.)

Print Name, Title: PAUL C. SWEETWOOD, PE
VICE PRESIDENT
T&M ASSOCIATES

Signature: _____

Date: 8/1/16

SITE & TEAM INFORMATION

Instructions

Provide brief background/description of customer and project site, including business/facility type, square feet, year built, years in operation, etc.

Table 1: Customer/Site Information

The proposed Combined Cooling Heating and Power (CCHP) Plant will be designed to serve three sets of buildings collectively addressed as Ocean County Judicial Complex, the buildings consist of Jail Areas, Courthouses, Sheriff's offices and various administrative areas. These buildings are owned and operated by the County of Ocean and are located along Hooper Avenue and Washington Street in Toms River, NJ. The three buildings included are: 1. Justice Complex, a 164,000 SF mixed use building constructed in 1982, 2. New Jail, a 168,000 SF jail building constructed in 2012 and 3. Courthouse Square, which consists of three interconnected buildings totalling 108,800 SF built in 1851, 1961 and 1965 respectively.

Instructions

Please include any additional pertinent staff, contractors, subcontractors and other sponsors not already listed below.

Table 2: Project Team

Role	Company Name	Company Address	Contact Person, Title	Phone Number	Relevant Experience[1]
Developer	n/a	n/a	n/a	n/a	
Equipment Manufacturer	CAT	855 Centennial Ave Piscataway, NJ 08854	Scott Yappen | Director, Business Development	908.210.6450	
Architect/Engineer	T&M Associates	11 Tindall Road, Middletown, NJ 07748	Paul C. Sweetwood, Vice President	732.671.6400	
Construction Mgr / GC	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	
Cx Authority	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	
LEED Consultant	n/a	n/a	n/a	n/a	
Mechanical Engineer	T&M Associates	11 Tindall Road, Middletown, NJ 07748	Paul C. Sweetwood, Vice President	732.671.6400	
Mechanical Contractor	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	
Electrical Engineer	T&M Associates	11 Tindall Road, Middletown, NJ 07748	Paul C. Sweetwood, Vice President	732.671.6400	
Electrical Contractor	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	
EMS Control Contractor	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	Subject to Public Bid	

1 Attach pages if necessary

Instructions

Please enter twelve (12) consecutive months of data for all electric, gas, and fuel utility accounts at the host site. Cost should be inclusive of any third party energy suppliers.
If additional accounts exist, please submit supplemental spreadsheet following the below format. Multifamily properties must include tenant energy usage.
Provide actual utility bills to support all inputs, or a utility summary produced directly from the utility. Investor-owned utility bills are required; third party bills are optional.

Table 3: Electric Utility Data

Pre-CHP Tariff	JCP&L GSP	Post-CHP Tariff	JCP&L GSP

Account Number	100017910215			Account Number	100076240165			Account Number	100017422278			Account Number				Account Number			
Month	Usage (kWh)	Demand (kW)	Cost ($)	Month	Usage (kWh)	Demand (kW)	Cost ($)	Month	Usage (kWh)	Demand (kW)	Cost ($)	Month	Usage (kWh)	Demand (kW)	Cost ($)	Month	Usage (kWh)	Demand (kW)	Cost ($)
January	289,998	576	32,441	January	171,146	312	19,203	January	109,822	294	13,436								
February	294,578	582	32,929	February	189,488	298	20,995	February	115,700	272	13,946								
March	285,258	569	31,922	March	163,354	294	18,307	March	105,415	274	12,850								
April	290,609	561	32,413	April	175,862	362	19,967	April	225,710	363	13,713								
May	304,864	728	32,433	May	172,045	372	19,697	May	128,611	372	15,696								
June	361,932	667	33,364	June	208,866	462	6,596	June	165,354	400	19,378								
July	404,627	686	35,758	July	259,887	561	8,119	July	196,481	428	19,563								
August	391,359	686	36,055	August	270,648	533	27,028	August	197,207	458	20,245								
September	383,893	679	34,951	September	274,516	520	27,195	September	208,781	418	20,717								
October	355,196	668	33,184	October	248,645	549	26,124	October	188,287	431	19,737								
November	319,754	706	29,464	November	181,274	419	19,085	November	139,673	379	14,874								
December	294,920	571	32,949	December	194,096	334	21,672	December	140,602	382	17,232								
Total	3,976,988		$397,863	Total	2,509,827		$233,988	Total	1,921,643		$201,386	Total				Total			

Baseline Peak kW	1,677		
Total Baseline MWh	8,408	Baseline Average $/kWh	$0.10
Total Electricity Cost	$833,237.33	Estimated Post-CHP tariff $/kWh	$0.10

Table 4: Gas, Fuel Utility Data

Pre-CHP Tariff	GSL	Post-CHP Tariff	GSL

Account Number	19-4510-0047-12			Account Number				Account Number				Account Number				Account Number			
Month	Usage (Therms)	Usage (MMBtu)	Cost ($)	Month	Usage (Therms)	Usage (MMBtu)	Cost ($)	Month	Usage (Therms)	Usage (MMBtu)	Cost ($)	Month	Usage (Therms)	Usage (MMBtu)	Cost ($)	Month	Usage (Therms)	Usage (MMBtu)	Cost ($)
January	24,083	2,408	12,632																
February	28,921	2,892	14,656																
March	17,258	1,726	9,783																
April	14,960	1,496	8,821																
May	13,398	1,340	13,058																
June	9,230	923	9,580																
July	7,604	760	8,707																
August	5,875	587	4,549																
September	7,905	790	5,928																
October	11,503	1,150	7,396																
November	12,738	1,274	7,888																
December	20,309	2,031	11,056																
Total	173,783	17,378	$114,055	Total				Total				Total				Total			

Total Baseline MMBtu	17,378	Baseline Average $/MMBtu	$6.56
Total Fuel Cost	$114,054.92	Estimated Post-CHP tariff $/MMBtu	$6.56

PROPOSED SYSTEM PERFORMANCE

Table 5: CHP or Waste Heat to Power Equipment Information

CHP or Waste Heat to Power?	CHP	**CHP Type (CHP only)**	Gas Engine
		If Other	
		For CHP, is waste heat used for cooling?[1]	Yes
		Will the system have blackstart capability?	Yes
		If the system is not blackstart capable, please describe the reason this was not included.	
		Will the generation system be used as an Emergency Management Facility?	No
		Does the facility have/or will have on-site renewable energy sources, such as solar PV, wind turbine, etc.?	No

1 An example of this would be an absorption chiller used for process/space cooling

Manufacturer	Model	Installed Rated Capacity (kW) per Unit	Number of Units	Total Installed Rated Capacity (kW)
CAT	CG132-12	600	1	600

Instructions

Tables 6 and 7 should summarize the operation of the total system. If installing multiple units with varying operation, please include unit by unit information to the right.

Table 6: Proposed System Overview (annual)

Energy Input		(MMBtu)	40,656.1
Electric Output		(kWh)	4,777,871.5
		(MMBtu)	16,302.1
Recoverable Thermal Output		(MMBtu)	17,447.2
Utilized Thermal Output[2]		(MMBtu)	13,259.4
	Gas/Fuel Savings	(MMBtu)	10,160.7
	Electricity Savings	(kWh)	908,203.9
Net Gas/Fuel Savings		(MMBtu)	-30,495.4
Annual System Efficiency		(%)	72.7%
Estimated Equipment Life[3]			25.0

NOTE: All outputs should be determined using the fuel's Lower Heating Value (LHV)

2 Heat used from the CHP system for the purpose of heating and cooling

3 Equipment life should be no less than 10 years, and no greater than 20 years. New Jersey Energy Savings Protocols recommend 10 year measure life for fuel cells, 15 years for CHP systems ≤ 1 MW, and 20 years for CHP > 1 MW.

Table 7: Rated System Information[4]

Energy Input	(MMBtu/h)	5.1
Rated Electric Output	(kW)	600.0
	(MMBtu/h)	2.0
Total Thermal Output	(MMBtu/h)	2.4
Recoverable Thermal Output	(MMBtu/h)	2.2
Fuel Conversion Efficiency	(%)	83.0%

4 Rated output as published by the manufacturer

Instructions

Table 8 should summarize the operation of the total system. If unit is operating at less than full load in any given month, enter percent operation in column M. If installing multiple units with varying operation, please include unit by unit information to the right.

Table 8: Proposed System Overview

	Anticipated Monthly Operating Hours[5]	Input Fuel (MMBtu)	Output Electricity (MMBtu)	Recoverable Thermal Output (MMBtu)	Utilized Thermal Output (MMBtu)	Electricity Efficiency (%)	Thermal Efficiency (%)	Annual System Efficiency (%)	Approximate Capacity Factor (%)	Part Load Operation (as % of full load)
Jan	707	3,535	1,417	1,517	1,308	40.1%	37.0%	77.1%	93.1%	98.0%
Feb	638	3,259	1,307	1,399	1,282	40.1%	39.3%	79.4%	95.0%	100.0%
Mar	707	3,024	1,212	1,298	1,025	40.1%	33.9%	74.0%	79.6%	83.8%
Apr	684	3,130	1,255	1,343	678	40.1%	21.7%	61.8%	85.1%	89.6%
May	707	3,265	1,309	1,401	708	40.1%	21.7%	61.8%	85.9%	90.5%
Jun	684	3,492	1,400	1,499	1,345	40.1%	38.5%	78.6%	95.0%	100.0%
Jul	707	3,609	1,447	1,549	1,495	40.1%	41.4%	81.5%	95.0%	100.0%
Aug	707	3,609	1,447	1,549	1,444	40.1%	40.0%	80.1%	95.0%	100.0%
Sep	684	3,492	1,400	1,499	1,069	40.1%	30.6%	70.7%	95.0%	100.0%
Oct	707	3,609	1,447	1,549	680	40.1%	18.8%	58.9%	95.0%	100.0%
Nov	684	3,492	1,400	1,499	1,139	40.1%	32.6%	72.7%	95.0%	100.0%
Dec	707	3,141	1,260	1,348	1,085	40.1%	34.6%	74.6%	82.7%	87.1%
Total	**8,322**	**40,656**	**16,302**	**17,447**	13,259	40.1%	32.6%	72.7%	90.9%	

5 Total annual operating hours should not exceed 8,760

Instructions

Table 9 should summarize the operation of the total system and indicate amount of utilized waste heat routed to various thermal technologies. If installing multiple units with varying operation, please include unit by unit information to the right.

Table 9: Breakdown of Utilized Thermal Output

	Process Heating (MMBtu)	Process Cooling (MMBtu)	Space Heating (MMBtu)	Space Cooling (MMBtu)	Domestic Hot Water (MMBtu)	Other (MMBtu)	Total Utilized Thermal Output (MMBtu)	% Thermal Output Offsetting Electricity[6]	Electricity Offset (MMBtu)
Jan	0	0	1,029	0	279	0	1,308	0%	0
Feb	0	0	1,030	0	252	0	1,282	0%	0
Mar	0	0	746	0	279	0	1,025	0%	0
Apr	0	0	408	0	270	0	678	0%	0
May	0	0	95	334	279	0	708	24%	170
Jun	0	0	238	837	270	0	1,345	56%	751
Jul	0	0	289	927	279	0	1,495	60%	894
Aug	0	0	267	898	279	0	1,444	58%	838
Sep	0	0	173	626	270	0	1,069	42%	446
Oct	0	0	401	0	279	0	680	0%	0
Nov	0	0	869	0	270	0	1,139	0%	0
Dec	0	0	806	0	279	0	1,085	0%	0
Total	**0**	**0**	**6,352**	**3,622**	**3,285**	**0**	13,259	23.4%	3,099

6 Electric energy savings should be reported only in cases where the recapture of thermal energy from the CHP system is used to displace electricity previously consumed for heating or cooling, such as an installation of an absorption chiller in place of an existing electric chiller.

Instructions

Please enter all available information for existing heating and cooling equipment to be removed, modified, or tied into the CHP system as a result of the repurposed thermal output from Table 9.

Table 10: Existing Heating/Cooling Equipment

Equipment Type	Manufacturer	Model	Capacity	Capacity Units	Qty	Efficiency	Efficiency Units
CHILLER	CARRIER	19-DK7873CL	350	USRT	1	0.674	kW/Ton
BOILER	CLEAVER BROOKS	CB200-500	16700	MBH	2	80%	%
BOILER	H.B. SMITH	28A-14	3563	MBH	2	80%	%
WATER HEATER	PVI	1250 N 250A-TP	1250	GAL/HR	2	80%	%

Instructions

Please enter all available information for new heating and cooling equipment to be installed in order to recover and utilize the repurposed thermal output from Table 9.

Table 11: New Heating/Cooling Equipment

Equipment Type	Manufacturer	Model	Capacity	Capacity Units	Qty	Efficiency	Efficiency Units
ABSORPTION CHILLER	CARRIER	16LJ-21	138	USRT	1	0.72	COP
HEAT EXCHANGER	BELL & GOSSETT	P21- DHW	2200	MBH	2	100	%
HEAT EXCHANGER	BELL & GOSSETT	P41	2200	MBH	2	100	%
HEAT EXCHANGER	BELL & GOSSETT	P42	800	MBH	1	100	%
PUMP	BELL & GOSSETT	E-1510 3EB	320	GPM	2	74.62	%

PROPOSED SYSTEM OPERATION

Instructions

Provide a description of the type and mode of operation and identify system as one of the following:

1. Grid-connected operating mode (parallel/capable of synchronizing with the electric grid; capable of automatically reducing load to prevent backfeeding the meter).
2. Grid-connected/grid-independent operating mode (parallel/capable of synchronizing with the electric grid and capable of switching automatically to independent, load-following operation when the grid is unavailable; automatic operation and synchronization of multiple power plants connected in parallel).
3. Stand-alone load-following operation (system confined to an independent circuit, no utility backup).
4. Battery interactive capabilities, if applicable.

System shall have the ability to automatically disconnect from the utility in the event of substantial grid congestion, interruption, or failure .

Table 12: Mode of Operation

The CCHP shall be capable of operating in both Grid-Connected as well as Grid-Independent modes. The generator will be capable of synchronizing with electric grid during grid parallel operation in a load following sequence to prevent any export of power to the grid. In the event of utility failure, the operator will be able to manually switch operation to grid independent operation.

Instructions

Provide the operational sequence that specifies the control system to be used. Also describe its integration with other on-site controls systems, as well as who will have the responsibility for system operation.

Table 13: Operational Sequence

Please see the attached sequence of operations on the following page.

Instructions

Describe any site-specific grid interconnection issues and costs, as well as any anticipated tariff changes and the date of those changes. A brief, clear plan for if and how the system will be properly interconnected to the grid and/or natural gas pipelines must be presented. Pressure and availability of natural gas at the site must also be described.

Table 14: System Interconnection

The proposed CHP will receive its fuel gas supply from New Jersey Natural Gas (NJNG). NJNG has high pressure gas pipe available in the street in Courthouse Lane. NJNG has confirmed that they can supply Natural Gas at 5 PSIG to the future CHP unit at no initial cost to the Owner. The Natural Gas will be supplied and billed under NJNG's Distributed Generation Service - Commercial (DGC) tariff. CHP Generator will be connected behind the electric meter to a main switchboard in the noted facilities, we have estimated the costs of the connection of the CHP to the main switchboard to be $67,000, we have also included $25,000 in fees for the electric utility to analyze the effect of the CHP installation on its infrastructure. A standby demand charge will be applied as part of the exisitng tariff. This change has ben incorporated into the financial analysis. This change will commence after the system is commissioned.

Instructions

Table 13: Operational Sequence

Ocean County Justice Complex CCHP Sequence of Operations

Generator Paralleling Switchgear and Controls

The generated power is derived from one 600 kW, 480 V three phase, four-wire, 60 Hz, Natural Gas driven generator set. The generator will work in two modes:

1. In parallel with the utility in Combined Heat and Power (CHP) mode and
2. Island mode to provide backup power

In general, major system actions, such as generator startup, starting in island mode, restoring from island mode, and restoring system configuration to normal lineup after an unstable condition or utility outage, will be manually initiated by the operator. Upon loss of power during CHP mode, the main service breaker will trip and remain open while the generator is manually transferred to island mode operation. After the utility power is restored, system operator will manually shut down the generator, reclose the main utility breaker and the generator will parallel with the utility to return to CHP mode.

During islanding mode, the building emergency generators can be used to supply vital loads that they are normally scheduled to supply. Alternately, the vital loads can be retransferred to the normal source manually, allowing the CHP generator to supply them.

Utility parallel mode of control will be a Load following control. The operator will specify the offset between the system demand and the generator output. The generator load increases or decreases to meet system demand less the specified offset. A minimum import occurs in all cases, but increases to satisfy system demand when demand exceeds generator capacity minus the offset.

Heat Recovery and Rejection

Heat is recovered from the Combined Heat and Power (CHP) package via a Hot Water Heat Recovery Loop (HWHRL). The CHP dissipates the heat from the engine exhaust, engine jacket and mixture intercooler using various heat exchangers in series in the Engine Cooling Loop (ECL). The engine cooling loop is thermally connected to the hot water heat recovery loop by a heat exchanger provided within the CHP package. Flow is diverted to dry coolers to remove any excess heat, beyond the capacity of the HWHRL when required. The ECL is completely controlled by controller integral to the CHP package.

1. HWHRL System:
    a. The primary source of heat rejection is the HWHRL heat exchanger serving the building side HWHRL. The “Lead” HWHRL Pump will be started by the system operator manually, via the BMS and will run continuously. If after 30 seconds (adjustable) the “Lead” pump should fail, the “Lead” pump will be given a stop command, the “Lag” pump will be started and an alarm will be generated at the Operator’s Workstation.
    b. The “Lead” pump will run continuously until (2) minutes (adjustable) after the CHP has shut down. The HWHRL supply will “inject” heat into Space Heating Heat Exchangers for both New Jail and Justice Complex, Domestic Hot Water Heaters for both New Jail and Justice Complex, Reheat Heat Exchanger for Justice Complex and an Absorption Chiller.
    c. The HWHRL water flow meter (FM) will adjust the pump speed, through its respective VFD, to maintain system flow at its set point.

d. The BMS (Building Management System) will provide BTU calculations for thermal energy rejected to the various end uses via HWHRL Flow Meter (FM) and Temperature Transmitters (TTs) at the beginning and end of the HWHRL system. This will indicate instantaneous and totalized thermal energy utilized from the CHP.

2. Absorption Chiller System
    a. The absorption chiller will be enabled/disabled by the system operator using BMS interface. When the chiller is enabled, the chiller will run under the control of its manufacturer furnished, integral control system. The operating engineer and BMS will be able to adjust the chilled water discharge temperature set point.
    b. The absorption chiller will be the "lead" chiller as it will be in series with the building electric chiller. The BMS will sense the building cooling load using the Chilled Water Flow Meter (CHW-FM) and CHW Supply and Return TTs. For building cooling load up-to the rated capacity of the absorption chiller, the chiller will maintain a CHWS temperature of 44 deg F (adjustable). As the load increases to beyond the rated capacity, the BMS will enable the electric chiller. The CHW Supply temperature of the absorption chiller shall be reset to 50 deg F, the building electric chiller will see this as the CHWR temperature and will work to maintain a CHWS temperature of 44 deg F (adjustable). The reverse will occur on a drop in building cooling load as measured by FM and CHWS/R TTs.
    c. The BMS will provide BTU calculations from Chilled Water generated by absorption chiller using CHW-FM and TTs on Chilled Water Supply and Return side of absorption chiller
    d. The condenser water (CW) for the absorption chiller will be provided by building CW loop. The BMS will maintain a CW supply temperature (adjustable) using the Cooling Tower (CT) fan and CT Bypass valve. The CW circuit for the Absorption Chiller will be set at a predetermined flow as specified by the chiller manufacturer using manual/PICV balancing valves.
3. New Jail Space Heating Heat Exchanger (HX-1) (Typical for HX-3, HX-4)
    a. On a drop in space heating supply water temperature, as sensed by a TT installed in the primary hot water return piping, the BMS will modulate the three way control valve open to the heat exchanger, to maintain the space heating supply water temperature at its set point (adjustable). This should be set at two degrees above the boiler hot water set point to prevent short cycling of boilers. On a rise in space heating supply temperature above the set point, the valve will modulate closed to the heat exchanger.
    b. If the HWHRL return temperature as detected by TT on HWHRL return piping of HX-1 drops below 180 deg F (adjustable to match minimum allowable HWHRL temperature to the CHP), the three way valve will be positioned to bypass HX-1.
4. New Jail Domestic Hot Water (DHW) Heat Exchanger (HX-2) (Typical for HX-5)
    a. On a drop in the DHW supply water temperature (140 deg F set point, adjustable) as sensed by TT in DHW supply piping, the BMS will modulate three-way control valve open to the heat exchanger, to maintain the domestic hot water supply temperature at its set point. On a rise in domestic heating supply water temperature, the valve will modulate closed.

    b. If the HWHRL return temperature as detected by TT on HWHRL return piping of HX-2 drops below 180 deg F (adjustable to match minimum allowable HWHRL temperature to the CHP), the three way valve will be positioned to bypass HX-2.
5. Justice Complex Space Heating Hot Water Heat Exchanger (HX-3)
    a. Replicate sequences for HX-1 above
6. Justice Complex Reheat Hot Water Heat Exchanger (HX-4)
    a. Replicate sequences for HX-1 above
7. Justice Complex Domestic Hot Water Heat Exchanger (HX-5)
    a. Replicate sequences for HX-2 above
8. Natural Gas Fuel System – No associated control sequence
    a. The BMS shall monitor and record instantaneous and totalized gas consumption to the CHP in SCFH/SCF/BTU/hr/BTUs from the Natura Gas Flow Meter (NG-FM).
    b. The gas consumption data from NG FM shall be used in overall CHP system efficiency calculations

Outline the steps that will be taken to measure system performance post-installation. After the system is installed, 12 months of operational data must be provided within 24 months after the system becomes operational which demonstrates that proposed and/or minimum efficiency was achieved and that the system is generating electricity within 20% of the values stated in 'Proposed System Performance'. This shall be done by implementing appropriate metering as part of the system installation. Data collected should include, but is not limited to, fuel input (MMBtu), electrical output (kWh, MMBtu), recoverable and utilized thermal output (MMBtu).

Table 15: Metering Plan

The fuel supply to the CCHP will be meaured, totalized, logged and stored within the Building Automation System (BAS) for a minimum of 60 months, the hot water flow to/from the CCHP will be measured and logged using an in-line flow meter and stored within the BAS for a minimum of 60 months, the hot water return and supply temperatures will also be measured, logged and stored within the BAS for a minimum of 60 months.The net electric output from the CCHP shall be measured, logged and stored within the BAS for a minimum of 60 months. The overall CCHP system efficiency will be calculated by dividing sum of net electric output in BTUs and net heat recovered in BTUs by fuel consumption in BTUs over the reporting period.

PROPOSED SYSTEM COSTS

Table 16: CHP System Component Costs	
Prime Mover	$975,000.00
Fuel Compressor	$0.00
Fuel Reformer (Fuel Cell)	$0.00
Generator	incl. in prime mover cost
Heat Recovery	$111,200.00
Cooling Tower or other Heat Dump	incl. in prime mover cost
Absorption Chiller	$175,000.00
Desiccant	n/a
Controls	$100,000.00
Sound Attenuation	incl. in prime mover cost
Inlet Air Handling	incl. in prime mover cost
Vibration Isolation	incl. in prime mover cost
Emission Controls	incl. in prime mover cost
Black Start Capability (if being installed)*	
Other[1]:	
Black Start Capability (if not being installed)*	

* One needs to be completed - Black start pricing is required whether being installed as part of the system or not

Table 17: Design/Construction/Labor and Material Costs	
Engineering and Design	$350,000.00
Construction and Installation	$361,470.00
Site Preparation, Structural Modifications	$145,400.00
Fuel Line Installation/Modification	$20,000.00
Commissioning	
Other Materials (not covered in Table 9)	
Permitting Fees	
Electrical Tie-in	$67,000.00
Mechanical Tie-in	$475,000.00
Grid Interconnection	$25,000.00
Contingency	$118,438.00
Other[1]:	

1 Subject to program approval.

Table 18: CHP/Fuel Cell System Service and Maintenance Costs										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Warranty/Service Contract[2]	$103,430.77	$106,533.69	$109,729.70	$113,021.59	$116,412.24	$119,904.61	$123,501.75	$127,206.80	$131,023.00	$134,953.69

2 Warranty and/or service contract must cover all CHP equipment including ancillary equipment such as absorption chillers, controls, etc.

Total Turnkey Project Cost:	$ 4,109,226

AIR EMISSION DATA

Instructions

Input vendor supplied emissions coefficients below. Emission reduction formulas assume useful thermal output displaces natural gas. If thermal output is displacing other fuel sources, such as oil and/or propane, please contact the Program Manager for assistance at CHP@NJCleanEnergy.com

Table 19: Supplied Electricity	
Yearly Grid Supplied Electricity (Pre-Installation) (MWh/year):	8,408
Yearly CHP System Supplied Electricity (MWh/year):	4,778
Yearly Grid Supplied Electricity (Post-Installation) (MWh/year):	3,631

Table 20: Vendor Supplied System Emission Coefficients		
NOx:	0.16037058	lbs/MWh
SO_2:	0.002047284	lbs/MWh
CO_2:	0.53570598	lbs/MWh

Table 21: CHP/Fuel Cell Emissions Reductions		
NOx:	101.01	lbs
SO_2:	12,489.09	lbs
CO_2:	6,918,061.98	lbs

NJDEP Regulatory Limits for CHP Systems

NO_X: 0.047 lb/MMBtu

SO_2: 0.0006 lb/MMBtu

CO_2: 0.157 lb/MMBtu

VOC: 0.047 lb/MMBtu

TSP: 0.01 lb/MMBtu

PM-10: 0.038 lb/MMBtu

PROJECT SCHEDULES

Instructions

Provide a list of the necessary environmental and building permits or certificates to be obtained and anticipated dates of request and reciept.

Table 22: Permit/Certificate Schedule

Permit Description	Date Requested	Date Received
Air Emissions Permit Application	11/29/2017	1/28/2018
Construction Permits	6/1/2017	6/29/2017

Instructions

Enter approximate start and end dates for each major task throughout the construction cycle, such as: engineering, purchase, construction, start-up, and commissioning.

Table 23: Construction Schedule

Task	Start Date	End Date
Project Financing	8/1/2016	11/29/2016
Non–Refundable Deposit on Equipment	n/a	n/a
Equipment Procurement	2/27/2017	3/29/2017
Equipment Delivered to site	11/22/2017	11/29/2017
System Installation Complete	11/29/2017	2/27/2018
Installed System Shakedown Complete	3/13/2018	3/27/2018
Full Scale System Verification	4/3/2018	5/3/2018
CHP Project Complete	5/3/2018	6/2/2018

INCENTIVE CALCULATION & COST BENEFIT ANALYSIS

Instructions

Total of all funding not to exceed 100% of project cost. Funding must include all local, state, federal, and private sources of funding.
Multi-year funding, such as federal depreciation credits, must be entered as a single value using Net Present Value (NPV).
Maintenance costs apply only to the first 10 years of financial evaluation.
Projects being financed, leased, or under a Power Purchase Agreement must submit supplemental cash flow analysis. All other project have the option to submit a supplemental cash flow analysis, although Program Manager may request one during the review process.

Project to Be Purchased Through:	Finance

Table 24: Incentive Calculation	
System Size (kW)	600
System Type	CHP
Final Incentive Amount	$ 1,100,000
Final Incentive Capped at	System Size

Table 25: Incentive Payment Schedule	
Incentive 1: Purchase (30%)	$330,000.00
Incentive 2: Installation (50%)	$550,000.00
Incentive 3: Performance (20%)	$220,000.00

Table 26: Funding Sources	
Anticipated NJCEP Incentive	$1,100,000.00
Federal Tax Credit	$0.00
Bonds/Refunding Bonds/Lease for Capital Costs	$1,823,508.00
Operating Budget for Service and Maintenance	$1,185,717.85
Total Project Funding	$4,109,225.85
Total Project Cost	$4,109,225.85

Table 27: Cost Benefit Analysis	
Simple Payback Period (years) w/o incentive and Federal Tax Credit	11.31
Simple Payback Period (years) w/ incentive and Federal Tax Credit	8.28

Appendix A

Map of Site

NEW COOLING TOWER

TEMPORARY DEMOLITION TO RIG NEW EQUIPMENT

MODIFY WALLS TO RIG EQUIPMENT AND ENABLE FUTURE MAINTENANCE ACCESS

8" CWS/R

NEW CW PUMPS

ABS CHILLER

8"CHWS/R (1.5" THK. INSULATION)

6" HWS/R (1.5" THK INSULATION)

CONTRACTOR TO PUNCH HOLE IN THIS WALL FOR PIPE PENETRATION. SEAL & RESTORE WALL

8" CHWS/CHWR TO/FROM ABS CHILLER

MECHANICAL EQUIPMENT ROOM #2

SECURE AREA

HWS/R TO/FROM CHP

TO/FROM CHW LOOP

DOM. WATER & FIRE PUMP ROOM

NEW ELECTRIC CHILLER

JUSTICE COMPLEX DHW HEAT EXCHANGER (H/X-5)

TO/FROM DHW TANKS

HWS/R

JUSTICE COMPLEX PUMP RM. #1

(2) 6" DIA. PIPES WITH 1.5" THK. INSULATION TO HANG BELOW CEILING THRU SECURE AREA

CONTRACTOR TO PUNCH HOLE IN THIS WALL FOR PIPE PENETRATION. SEAL & RESTORE WALL.

JUSTICE COMPLEX MECHANICAL EQUIPMENT ROOM #1

HWS/R

HWS/R

JUSTICE COMPLEX SPACE HEATING HEAT EXCHANGER (H/X-3)

JUSTICE COMPLEX REHEAT HEAT EXCHANGER (H/X-4)

JUSTICE COMPLEX BOILER ROOM

HWS/R

EXPANSION TANK

NEW JAIL MECHANICAL ROOM

NEW JAIL SPACE HEATING HEAT EXCHANGER (H/X-1)

CHEMICAL TREATMENT

NEW JAIL DOMESTIC HOT WATER HEAT EXCHANGER (H/X-2)

FENCE AND WALL MODIFICATIONS IN THIS AREA FOR CHP ACCESSABILITY AND MAINTENANCE

2" CITY WATER HEAT TRACE AND INSULATE

ELECTRICAL HEAT TRACE ON ALL OUTDOOR PIPING

14" DIA. CHP EXHAUST TO TERMINATE ABOVE BUILDING ROOF

AIR SEPARATOR

NEW COMBINED HEAT AND POWER UNIT

JUSTICE COMPLEX & NEW JAIL FLOOR PLAN
SCALE: 1" = 16'-0"

N

GRAPHIC SCALE
16 0 8 16 32
(IN FEET)
1/16 inch = 1 ft.

ABBREVIATIONS

DHW	DOMESTIC HOT WATER
HW	HOT WATER
S	SUPPLY
R	RETURN
CHW	CHILLED WATER
CW	COLD WATER
DIA.	DIAMETER
INSUL.	INSULATION
THK.	THICK
H/X	HEAT EXCHANGER
CHP	CHP
BLDG.	BUILDING
⋈	VALVE
⍁	H/X
⊣⊢	FLANGED CONNECTION

NO.	DATE	REVISIONS	BY	CHKD

06/24/16

PAUL C. SWEETWOOD
NEW JERSEY PROFESSIONAL ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE31920

OCEAN COUNTY UTILITIES AUTHORITY

JUSTICE CENTER AND NEW JAIL CHP

OCEAN COUNTY, NEW JERSEY

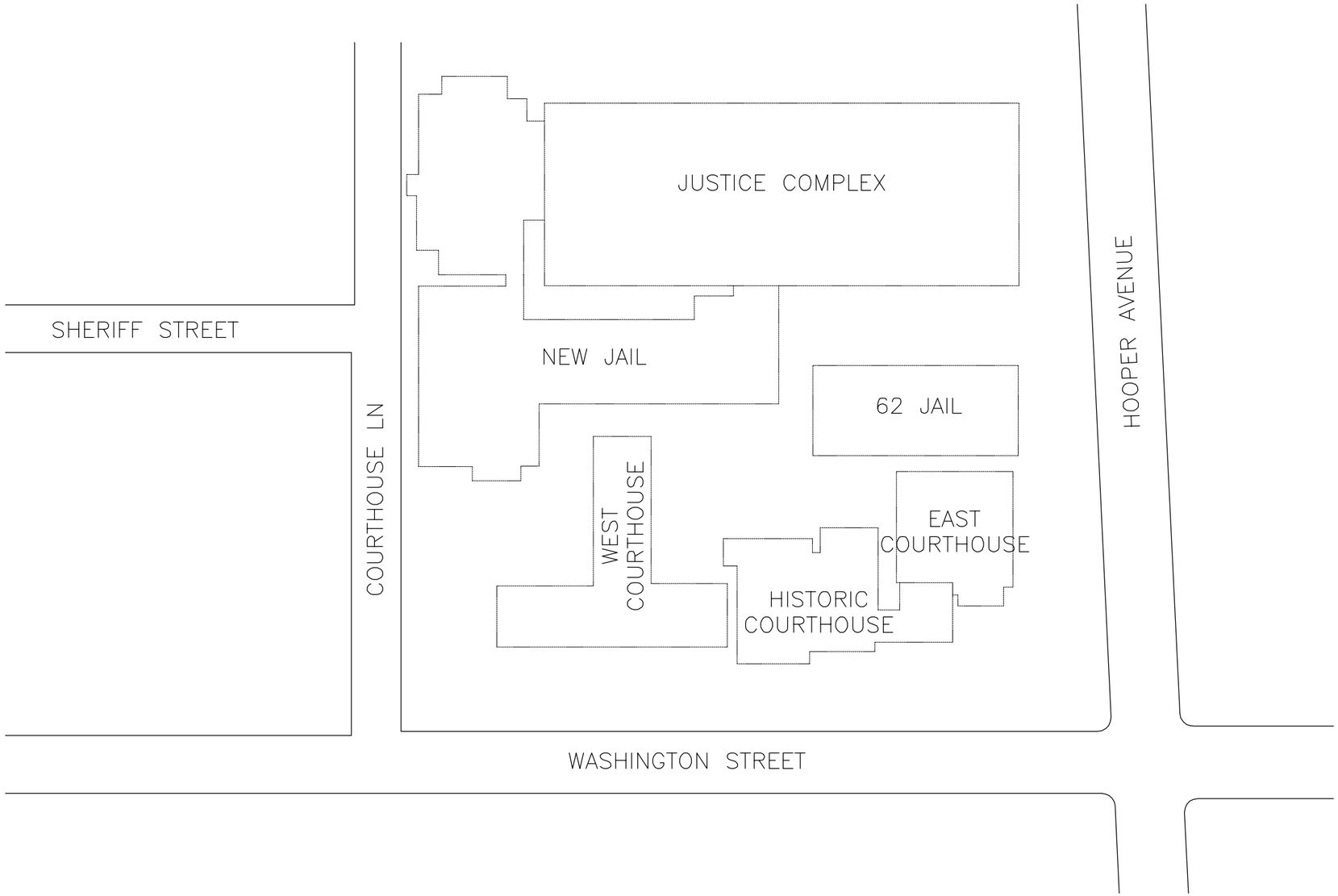
JUSTICE COMPLEX
OVERALL PLAN

T&M ASSOCIATES
YOUR GOALS. OUR MISSION.
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
www.tandmassociates.com

OFFICES LOCATED IN:
DELAWARE, INDIANA, KENTUCKY, MASSACHUSETTS, MICHIGAN, NEW JERSEY, OHIO AND PENNSYLVANIA

DESIGNED BY	KB
CHECKED BY	PCS
DRAWN BY	GAR
DATE	06/24/16
SCALE	NONE
PROJ. NO.	OCTY00582
DRAWING	M1
SHEET	2 OF ??

PROJECT INFORMATION:
FILE PATH: H:\OCTY\00582\Plans\
FILE NAME: Piping Physical Plan-24x36.dwg
PLOT SCALE: 1.0000 PLOT DATE: 28 Jul 2016, 11:47AM
LAST SAVE BY: kbajaj



OCEAN COUNTY CHP KEY PLAN

SCALE = 1" = 500'

NO.	DATE	REVISIONS	BY	CHECKED

OCEAN COUNTY

JUSTICE COMPLEX CHP KEY PLAN
TOMS RIVER, OCEAN COUNTY, NJ

ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CERTIFICATE OF AUTHORIZATION 24GA27987500

PAUL C. SWEETWOOD, P.E.
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE 31920
DATE

DESIGNED BY	DRAWN BY	CHECKED BY
MCT	FA	PCS
PROJECT NO. 0CTY-00540	CADD FILE BASEPLANS-PROP.dwg	FIELD BK. #

DRAWING

SHEET

OF 7

Appendix B

Energy Balance

HEAT USAGE – FACILITY SPACE HEATING
ANNUAL: 8,110 MMBTU
MAX: 4,000,000 BTU/HR
MIN: 440,000 BTU/HR
AVG: 2,200,000 BTU/HR

HEAT USAGE – FACILITY DOMESTIC HOT WATER
ANNUAL: 6,570 MMBTU
MAX: 3,000,000 BTU/HR
MIN: 0 BTU/HR
AVG: 750,000 BTU/HR

EXISTING EQUIPMENT

ELECTRIC SUPPLY FROM JCPL (UTILITY COMPANY)
ELECTRIC CONSUMPTION
ANNUAL: 2,932,238 KWH
MAX: 794 KW
MIN: 28 KW
AVG: 335 KW

ELECTRIC SUPPLY TO THE FACILITY
ELECTRIC CONSUMPTION
ANNUAL: 7,449,223 KWH
MAX: 1,363 KW
MIN: 404 KW
AVG: 850 KW

CHP
NET POWER OUTPUT
ANNUAL: 4,516,985 KWH
MAX: 569 KW
MIN: 448 KW
AVG: 543 KW

EXHAUST GAS
TEMPERATURE: 300 DEG F

FUEL GAS SUPPLY TO CHP
ANNUAL: MMBTU
MAX: BTU/HR
MIN: 0 BTU/HR
AVG: BTU/HR
GAS FLOW: 5270 CFH

FM

EXP. TANK

AAV

AS

TT TI

VFD VFD

PS PS PS PS

HHWRL PUMPS

FM

DPT

CHP
HEAT RECOVERED:
ANNUAL: 13,259 MMBTU
MAX: 2,190,000 BTU/HR
MIN: 960,000 BTU/HR
AVG: 1,600,000 BTU/HR

COMBINED HEAT & POWER UNIT #1 (600 kWe)

TO/FROM CT

LOCATED IN EXISTING STORAGE ROOM NEXT TO CW PUMP ROOM

M

ABSORPTION CHILLER

TO ELECTRICAL CHILLER CHWR PORT

NC

FM

FROM BLDG. CHWR

300 GPM
195 DEG F

300 GPM
180 DEG F

S/W

S/W

S/W

S/W S/W NC

SW SW

HX#1 NEW JAIL SP. H/X

HX#2 NEW JAIL DHW HX

NEW JAIL BOILER ROOM

TO BLDG. HW HEATING H/X
360 GPM
178 DEG F

FROM BLDG. HWR

TO DHW STORAGE TANK
52 GPM
140 DEG F

FROM BLDG. DHW RECIRC. LOOP

S/W S/W NC

SW SW

SP HX#3 JC SPACE HEATING H/X

HX#4 JC REHEAT H/X

H/X#5 JC DHW H/X

JUSTICE COMPLEX BOILER ROOM

TO BLDG. HW HEATING H/X
600 GPM
178 DEG F

FROM BLDG. HWR

TO DHW STORAGE TANK
52 GPM
140 DEG F

FROM BLDG. DHW RECIRC. LOOP

TO BLDG. RHW H/X
80 GPM
150 DEG F

FROM BLDG. RHWR

PROPOSED WASTE HEAT RECOVERY EQUIPMENT

SUPPLEMENTAL SPACE HEATING HEAT EXCHANGER
HEAT RECOVERED:
ANNUAL: 6,352 MMBTU
MAX: 2,190,000 BTU/HR
MIN: 110,000 BTU/HR
AVG: 1,600,000 BTU/HR

DOMESTIC HOT WATER HEAT EXCHANGER
HEAT RECOVERED:
ANNUAL: 3,285,000 MMBTU
MAX: 2,190,000 BTU/HR
MIN: 0 BTU/HR
AVG: 380,000 BTU/HR

ABSORPTION CHILLER
HEAT RECOVERED:
ANNUAL: 3,622 MMBTU
MAX: 2,080,000 BTU/HR
MIN: 420,000 BTU/HR
AVG: 1,060,000 BTU/HR

ABBREVIATIONS

DHW	DOMESTIC HOT WATER
HW	HOT WATER
S	SUPPLY
R	RETURN
CHW	CHILLED WATER
CW	COLD WATER
DIA.	DIAMETER
INSUL.	INSULATION
THK.	THICK
H/X	HEAT EXCHANGER
CHP	COMBINED HEAT AND POWER
BLDG.	BUILDING
CT	COOLING TOWER
S/W	SUMMER WINTER CHANGEOVER VALVE
NC	NORMALLY CLOSED

NO.	DATE	REVISIONS	BY	CHKD

06/24/16

PAUL C. SWEETWOOD
NEW JERSEY PROFESSIONAL ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. GE31920

OCEAN COUNTY UTILITIES AUTHORITY

JUSTICE CENTER AND NEW JAIL CHP

OCEAN COUNTY, NEW JERSEY

JUSTICE COMPLEX

CHP FLOW DIAGRAM

YOUR GOALS. OUR MISSION.
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
www.tandmassociates.com

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DESIGNED BY KB	DRAWING M2
CHECKED BY PCS	
DRAWN BY GAR	SHEET 3
DATE 06/24/16	OF ??
SCALE NONE	
PROJ. NO. OCTY00582	

PROJECT INFORMATION:
FILE PATH: H:\OCTY\00582\Plans\
FILE NAME: Flow Diagrams.dwg
LAST SAVED: 29 Jul 2016, 2:26PM
LAST SAVE BY: kbojsj

Appendix C

Specification Sheets

Reference data sheet

Technical data
600 kWel; 480 V, 60 Hz; Natural gas, MN = 70

Design conditions

Comb. air temperature / rel. Humidity:	[°F] / [%]	77 / 60
Altitude:	[ft]	328
Exhaust temp. after heat exchanger:	[°F]	248
NO_x Emission (tolerance - 8%):	[g/bhph]	0,99

Fuel gas data: 2)

Methane number:	[-]	70
Lower calorific value:	[BTU/ft^3]	1058,97
Gas density:	[lb/ft^3]	0,05
Standard gas:	Natural gas, MN = 70	

Genset:

Engine:	**CG132-12**	
Speed:	[1/min]	1800
Configuration / number of cylinders:	[-]	V / 12
Bore / Stroke / Displacement:	[in] / [in] / [in^3]	5,2 / 6,3 / 1603
Compression ratio:	[-]	12,0
Mean piston speed:	[ft/s]	31,496063
Mean lube oil consumption at full load:	[lb/hr]	0,26455026
Engine-management-system:	[-]	TEM EVO
Generator:	**Marelli MJB 400 LA4**	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	480 / ±10 / 1
Speed / frequency:	[1/min] / [Hz]	1800 / 60

Energy balance

Load:	[%]	**100**	**75**	**50**
Electrical power COP acc. ISO 8528-1:	[kW]	**600**	**450**	**300**
Engine jacket water heat:	[BTU/min±8%]	16734	13490	10644
Intercooler LT heat:	[BTU/min±8%]	2391	1480	854
Lube oil heat:	[BTU/min±8%]			
Exhaust heat with temp. after heat exchanger:	[BTU/min±8%]	21686	17702	13092
Exhaust temperature:	[°F]	910	945	975
Exhaust mass flow, wet:	[lb/hr]	7430	5756	4063
Combustion mass air flow:	[lb/hr]	7187	5567	3926
Radiation heat engine / generator:	[BTU/min±8%]	1309 / 1138	1025 / 1025	740 / 911
Fuel consumption:	[BTU/min+5%]	82704	64433	46276
Electrical / thermal efficiency:	[%]	41,3 / 46,5	39,7 / 48,4	36,9 / 51,3
Total efficiency:	[%]	87,8	88,1	88,2

System parameters 1)

Ventilation air flow (comb. air incl.) with ΔT = 15K	[lb/hr]	37500
Combustion air temperature minimum / design:	[°F]	68 / 77
Exhaust back pressure from / to:	[inWC]	12 / 20
Maximum pressure loss in front of air cleaner:	[inWC]	2
Zero-pressure gas control unit selectable from / to: 2)	[inWC]	8 / 80
Pre-pressure gas control unit selectable from / to: 2)	[psi]	7 / 145
Starter battery 24V, capacity required:	[Ah]	143
Starter motor:	[kWel.] / [VDC]	5,4 / 24
Lube oil volume engine / external oil tank:	[gal(US)]	26 / 69
Dry weight engine / genset:	[lb]	5842 / 13779

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	0 / 35
Water volume engine jacket / intercooler:	[gal(US)]	11 / 1,3
KVS / Cv value engine jacket water / intercooler:	[ft^3/h]	1307 / 367
Jacket water coolant temperature in / out:	[°F]	183 / 198
Intercooler coolant temperature in / out:	[°F]	104 / 111
Engine jacket water flow rate from / to:	[gpm]	141 / 207
Water flow rate engine jacket water / intercooler:	[gpm]	144 / 44
Water pressure loss engine jacket water / intercooler:	[psi]	11 / 14

3332247EA

1) See also "Layout of power plants": 2) See also Techn. Circular 0199-99-3017 132-12-E-60-00480-M-N_e

Frequency band f [Hz]	25	31,5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	L_{WA} [dB(A)]	S [m^2]
Air-borne noise 4) $L_{W,Terz}$ [dB(lin)]	85	91	101	106	99	106	110	107	112	117	111	112	112	107	107	108	105	106	105	105	106	103	103	104	109	102	98	95	92	118	81
Exhaust noise 5) $L_{W,Octave}$ [dB(lin)]				118			129			134			128			128			128			122			116					133	15,2

4) DIN EN ISO 3746 5) DIN 45635-11 Appendix A (±3 dB) L_W: Sound power level S: Area of measurement surface (S_0=1m^2)

ABSORPTION CHILLER SPECIFICATIONS

er. 4.1.4 Reference Specifications
Region : US Date : 20-May-16
Project name : Ocen County Justice , USA Spec.No. : 0000-160001
Model name : 16LJ-21 1 Unit Selection : 2

Cooling capacity		138 USRT	486 kW
Chilled water	Inlet temperature	54.0	oF
	Outlet temperature	50.0	oF
	Flow rate	836.0	gpm
	Pressure drop	22.2	ft.H2O
	* Pass number (Evaporator)	2	(Special)
	Connection diameter (ANSI)	5	inch
	Max. working pressure	150	psig
	Fouling factor	0.00010	ft2oFh/Btu
	Brine:Fresh water	0.0	%
Cooling water	Inlet temperature	85.0	oF
	Outlet temperature	95.0	oF
	Flow rate	786.0	gpm
	Pressure drop	29.9	ft.H2O
	* Pass number (Absorber + Condenser)	2 + 2	(Special)
	Connection diameter (ANSI)	6	inch
	Max. working pressure	150	psig
	Fouling factor	0.00025	ft2oFh/Btu
	Brine:Fresh water	0.0	%
Hot water	Heat input	2,308	MBH
	Inlet temperature	190.0	oF
	Outlet temperature	170.0	oF
	Flow rate	243.0	gpm
	Pressure drop	5.7	ft.H2O
	* Pass number (Generator)	3	(Special)
	Connection diameter (ANSI)	5	inch
	Max. working pressure	150	psig
	Fouling factor	0.00010	ft2oFh/Btu
	Brine:Propylene glycol	30.0	%
COP		0.72	---
Electrical data	Power source	3 phase, 460 V, 60 Hz	
	Electric consumption	6.6 kVA	
	Total electric current	8.6 A	
	Motor output Absorbent pump	2.2 kW	5.1 A
	Refrigerant pump	0.2 kW	1.3 A
	Purge pump	0.8 kW	1.5 A
Overall dimensions	Length (L)	152 inch	
	Width (W)	62 inch	

	Height (H)	93 inch
	Space for tube removal	134 inch
Weight	Operating weight	15,000 lb
	Max. shipping weight	12,800 lb
	Total shipping weight	12,800 lb
Shipping section		One section
Remark	Rated in accordance with ARI-560	

Pressure drop value of each water system does not include the static pressure difference.

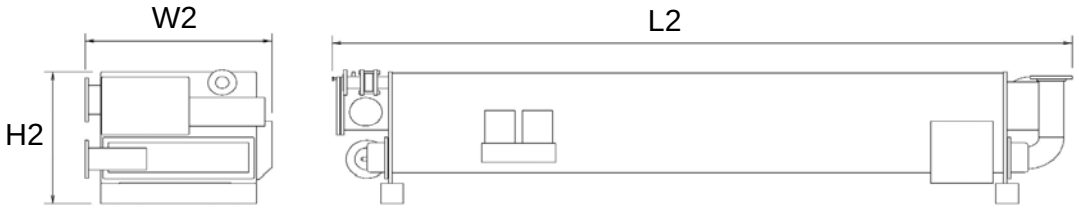
* ----- Option

Two-pieces shipping

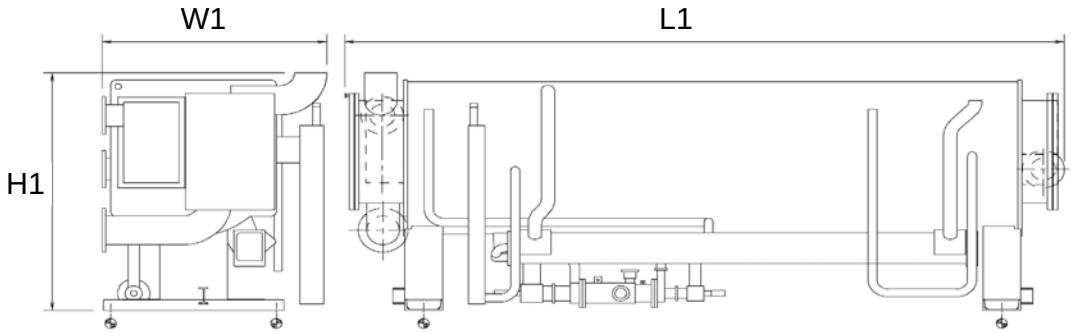
TSA-16	Lower shell				Upper shell				Solution	
	L1	W1	H1	Weight	L2	W2	H2	Weight	Weight	Bottle
	inch	inch	inch	lb	inch	inch	inch	lb	lb	
LJ-11	106	57	65	4,200	110	47	41	2,300	1,400	3
LJ-12	106	57	65	4,500	110	47	41	2,300	1,400	3
LJ-13	146	57	65	5,300	150	47	41	3,100	1,800	4
LJ-14	146	57	65	5,600	150	47	41	3,100	1,800	4
LJ-21	149	63	68	6,900	152	54	44	3,800	2,000	4
LJ-22	149	63	68	7,100	152	54	44	4,000	2,500	4
LJ-23	188	63	68	8,000	194	54	44	4,900	2,900	5
LJ-24	188	63	68	8,400	194	54	44	5,100	3,100	5
LJ-31	194	67	72	10,400	196	54	45	6,200	3,600	6
LJ-32	194	67	72	10,600	196	54	45	6,700	3,800	6
LJ-41	193	69	80	13,100	202	61	47	7,100	4,500	8
LJ-42	193	69	80	13,300	202	61	47	7,500	4,700	8
LJ-51	199	81	89	17,200	208	73	53	11,500	5,300	9
LJ-52	221	81	89	19,000	229	73	53	12,200	6,000	10
LJ-53	240	81	89	20,300	249	73	53	12,800	6,700	11

Note) 1) Above dimensions are not included packing size.
2) Control panel (63 x 24 x 12 inch, 220 lbs) is shipped separately.
Control panel of LJ-41,42,51,52 and 53 is shipped with lower shell.
3) Solution bottle size is 24 x 24 x 38 inch.
The solution weight is included bottle weight.

a) Upper shell



b) Lower shell



Carrier SANYO	**Shipping dimensions (Two-pieces shipping)**	Model **TSA-16LJ** Drawing code **LJ-008-131-26-1**

NOTE

(1) DIMENSIONS (L), (W), (H), ARE FOR STANDARD MACHINE.
THE DIMENSIONS ARE CHANGED BY PARTS ADDED.

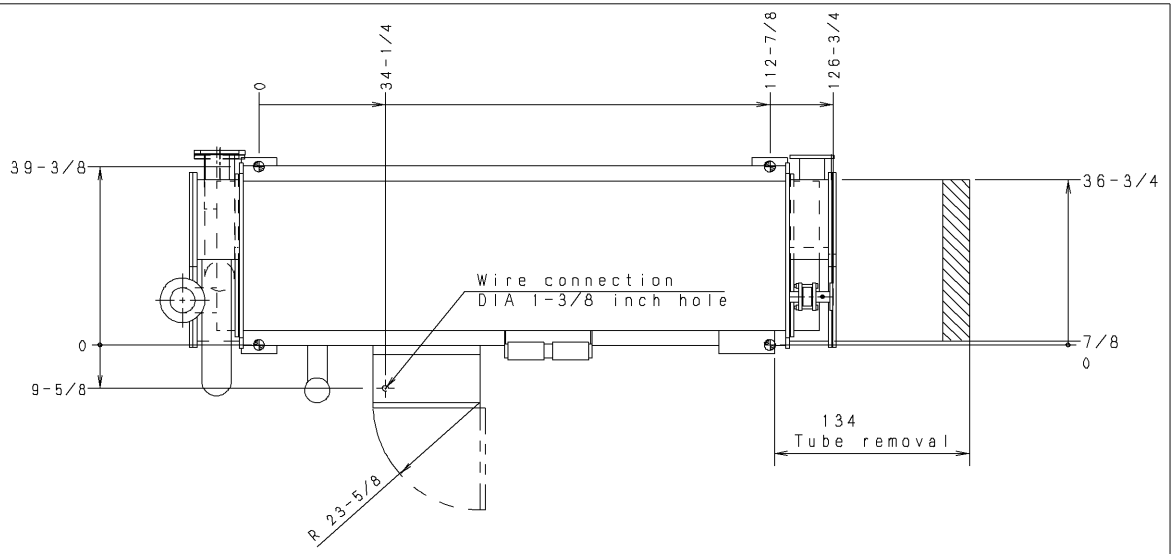
(2) ⊕ INDICATES THE POSITION OF ANCHOR BOLTS.

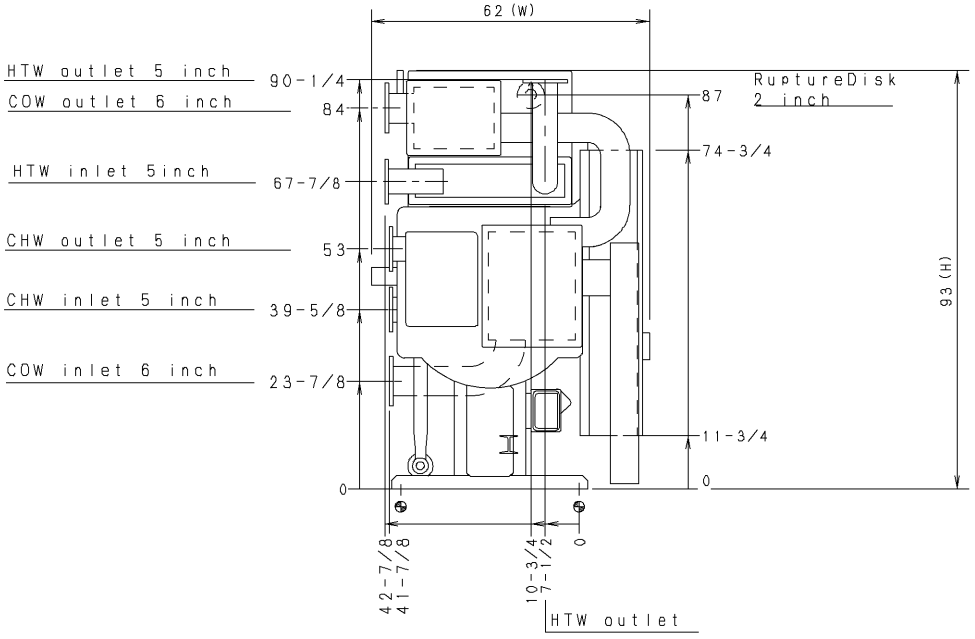
(3) CLEARANCE SPACE MUST BE SAVED EITHER SIDE OF THE CHILLER

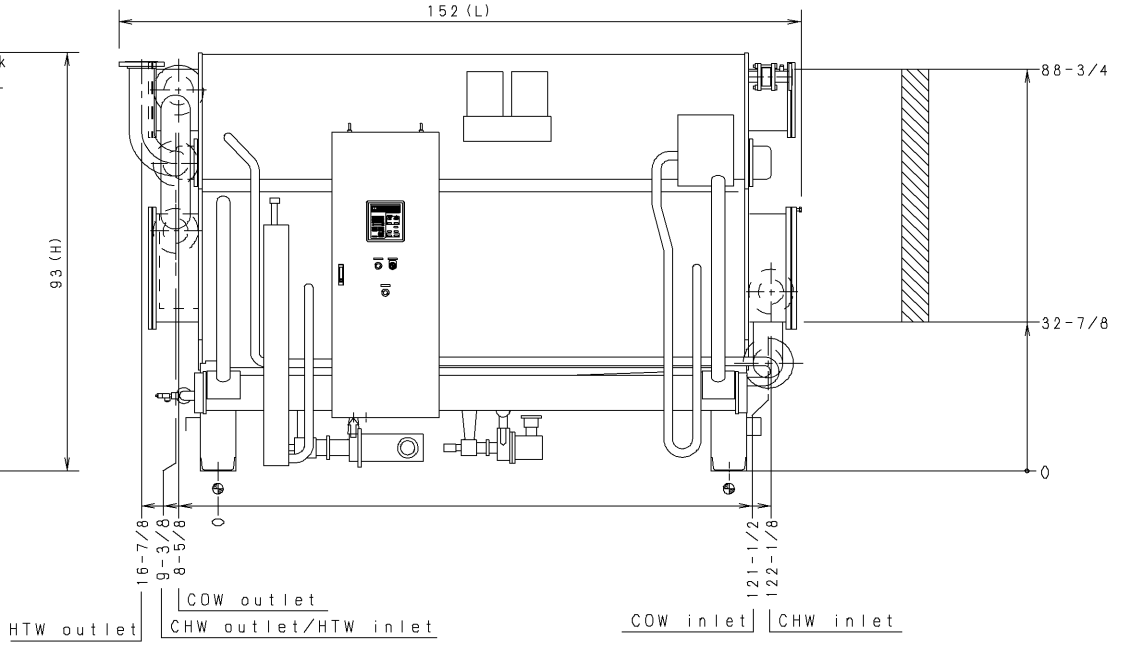
(4) ALL EXTERNAL WATER PIPING ARE TO BE PROVIDED
WITH WELDED ANSI 150LB FLANGES BY THE CUSTOMER.

(5) ⇑ INDICATES THE POSITION OF THE POWER SUPPLY
CONNECTION ON CONTROL PANEL. (DIA. 1-3/8 INCH)

(6) INSTALLATION CLEARANCE
·LONGITUDINAL DISTANCE:40 INCH
·TOP :8 INCH
·OTHERS:20 INCH







E3 A3 C2 G4

Carrier
SANYO

DIMENSIONS

TSA-16LJ-21

LJ-006-505-00-4

Guide specifications

Single-Effect, Low Temperature Hermetic Absorption Liquid Chillers

Size Range: **75 to 525 Tons**

Carrier-Sanyo Model Number: **16LJ**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Electronically controlled, single effect (one-stage) absorption liquid chiller utilizing hermetic refrigerant and absorbent pumps, lithium bromide solution as the absorbent, and water as the refrigerant. Low temperature hot water shall be supplied to the generator as the heat source.

1.02 QUALITY ASSURANCE

A. Chiller performance shall be rated in accordance with ARI Standard 560-2000.

B. Chiller shall be manufactured in accordance with ANSI/ASHRAE 15 (latest edition) Safety Code for Mechanical Refrigeration.

C. Chiller shall be designed and constructed to meet applicable UL requirements and shall bear the UL label.

D. Each chiller shall undergo a series of standard factory tests to ensure that the unit is leak tight, that all electrical components operate as intended, and that every aspect of unit fabrication meets stringent quality standards in accordance with good practice and the manufacturer's quality assurance requirements.

1. The shellside of each chiller shall be leak tested by pressurizing to 7 psig with nitrogen and then checked by spraying a soap and water mixture on all welds, tube joints and/or gasketed joints to identify any major leaks. Afterward, a mass spectrometer test shall be performed by evacuating the unit to 0.01 mm Hg absolute, covering the machine with a vinyl tent and introducing helium gas under the tent. Any remaining leaks will allow the helium to be drawn into the shellside of the machine. The acceptable total leak rate as measured by the mass spectrometer test shall not exceed .000002 cc/sec standard air.
2. The tubeside of the evaporator, absorber, condenser and generator shall be hydrostatically tested at 1.5 times rated design pressure and held for 1 hour.
3. All machine wiring shall undergo an insulation resistance test. The machine control panel and all electrical components shall also be functionally tested to verify continuity and proper electrical operation.
4. Final assembly inspection shall consist of verifying that all valves, controls, instrumentation, pumps, purge components and all other machine components have been properly installed on the machine.
5. Each unit shall be checked for overall appearance and dimensional accuracy.
6. Final inspection shall be performed on each unit to check that the nameplate data is correct and that all accessories are furnished as required.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Unit shall be stored and handled in accordance with the manufacturer's recommendations.

B. Unit shall be factory-charged with lithium bromide solution if the machine is configured to ship in one piece. For shipments of multiple pieces, charging of lithium bromide solution shall be performed at the jobsite in accordance with the manufacturer's written instructions.

C. All units shall be shipped with 3 psig nitrogen pressure.

D. Chiller shall be shipped with nameplates indicating name of manufacturer, model size, serial number and all other pertinent machine data.

1.04 WARRANTY

Manufacturer shall guarantee the chiller against defects in materials or workmanship for a period of one year from date of initial operation or 18 months from date of shipment, whichever occurs first. Manufacturer shall provide the labor to repair or replace any part found to be defective in material or workmanship within the warranty period.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Absorption liquid chiller shall include evaporator, absorber, condenser, generator, solution heat exchanger, refrigerant/absorbent pumps, purge system, piping, wiring, controls and auxiliaries. Standard shipment of the machine shall be in one piece. Initial charge of lithium bromide shall be shipped inside the machine for all single-piece shipments. For multiple-piece shipments, initial charge of lithium bromide shall be shipped separately for charging at the jobsite. Generator shall be designed for operation on low temperature hot water as specified on the equipment schedule. A rupture disk shall be provided as standard on all machines.

B. Operating Characteristics:

1. Chiller operation shall be characteristic of a single-effect absorption cycle. The weak solution pumped from the absorber to the generator shall initially pass through a solution heat exchanger to improve operating efficiency by preheating the weak solution on the tube side with the strong solution returning from the generator on the shellside.
2. Unit shall be capable of continuous operation from 100 to 10% capacity, with entering condenser water temperatures as low as 64 F without the need for a cooling tower bypass valve. Thermostat on/off control of the cooling tower fan is recommended when cooling water temperature falls below 64 F.

C. Heat Exchangers:

1. All heat exchangers shall be of shell and tube construction with shells, tube sheets, tube support sheets and waterboxes fabricated of carbon steel. All heat exchangers shall incorporate straight tubes. Tube material shall be copper for all heat exchangers. The evaporator, absorber, condenser and generator tubes shall be rolled into grooved tubesheets and expanded into tube support sheets, and shall be individually replaceable.
2. The evaporator, absorber and condenser waterboxes shall be designed for 150 psig working pressure. The absorber and condenser waterboxes shall be hinged to permit access to all tubes from either end. Nozzle-in-head (NIH) type waterboxes shall be supplied on the evaporator while the absorber-condenser waterboxes shall be marine type. Waterboxes shall be provided with vent and drain connections. Epoxy painting of the waterboxes and tube sheets shall be provided for corrosion protection. ANSI 150 psig R.F. (raised face) flanges shall be furnished on all waterbox nozzle connections.
3. The generator tube side shall be designed for 150 psig working pressure for use with low temperature hot water.
4. A solution heat exchanger shall be an integral part of the machine to increase cycle efficiency by preheating the weak solution on its way to the generator while pre-cooling the strong solution returning from the generator.
5. Dispersion trays shall evenly distribute refrigerant over the evaporator tubes and lithium bromide over the absorber tubes. These trays shall be fabricated of stainless steel to ensure continuous, corrosion-free, high-efficiency operation.

D. Pump/Motors:

Refrigerant and absorbent pump/motor assemblies shall be of the self contained, leakproof, hermetic type, without an external seal water system to minimize air leakage into the machine. Lubrication and cooling shall be accomplished by the fluid being pumped; auxiliary water piping for cooling and lubrication shall not be acceptable. Each pump casing shall be welded into the piping at the factory and shall be furnished with isolation valves on the suction and discharge side. Each pump shall include spring-loaded, wear-compensating tapered carbon bearings to ensure long life and reliability. Pump/motor assemblies shall be designed for 25,000 hours of normal operation between inspections.

E. Purge System:

An automatic purge system shall be furnished to provide a continuous purging action whenever the chiller is in operation to assure long machine life and efficient performance. Noncondensables shall be removed from the absorber by a liquid eductor, which shall use flow from the absorbent pump to create a suction. Noncondensables shall be stored external to the unit and shall be prevented from diffusing back into the machine when the unit is not operating. A palladium cell shall be provided to automatically vent hydrogen gas from the purge chamber to the atmosphere. It shall be continuously energized, even during machine shutdown. Further evacuation of the external storage chamber shall be accomplished with a factory-mounted purge pump, piped and wired to the machine. The need to operate the purge pump shall be indicated on the front of the control panel.

F. Controls, Safeties and Diagnostics:

1. Controls:
   a. The chiller shall be provided with a factory-installed and factory-wired microprocessor control system with modular component construction. The controls shall be of the PID type and shall continuously monitor the operation of the chiller and perform self-diagnostic checks to ensure that all control limits are satisfied and maintained. The system shall include a control center, power supply, temperature sensors, pressure sensors and all necessary auxiliary devices required for safe and proper chiller operation housed in a NEMA-1 enclosure with a hinged, lockable door. Control power shall be 24-1-60.

      The chiller control system shall have the ability to interface and communicate with a building management system with additional hardware.

      The control system shall include a 7-segment light-emitting diode (LED) display screen with function keys, emergency stop button and indication lamps. The microprocessor shall be configurable to display either English or metric units.

   b. The control panel display screen shall allow an operator to easily set and display the operating mode and configurable settings of the machine. The display shall indicate power on, chiller run status, safety circuit and alarm status, remote/local operation, standby mode and dilution cycle operation. Data input and machine settings shall be done via a data select key and shall allow scrolling through the individual chiller parameter settings.

c. Monitoring the operation of the chiller shall be done on a continuous basis. The display shall indicate all pertinent system operating parameters and alarms, as necessary, including the following:
   1) Chiller operating hours.
   2) Chilled water inlet temperature.
   3) Chilled water outlet temperature.
   4) Chilled water temperature set point.
   5) Cooling water inlet temperature.
   6) Condenser temperature.
   7) Generator temperature.
   8) Hot water inlet temperature.
   9) Hot water outlet temperature.
   10) Absorbent pump start counter and operating hours.
   11) Refrigerant pump start counter and operating hours.
   12) Purge pump start counter and operating hours.
   13) Chiller start counter.
   14) Purge tank pressure.

→ d. Capacity control shall be by means of electronically modulating the accessory hot water control valve to maintain the temperature of the chilled water. Load modulation shall be from 100% to 10% of machine full load under normal ARI conditions. The hot water control valve shall be positioned by a PID control algorithm to ensure precise control of desired chilled water temperature without hunting or overshooting the set point.

e. The microprocessor control system shall include a programmed sequence to ensure machine readiness prior to machine start-up. The microprocessor shall automatically enable and interlock the chilled water pump, cooling water pump and cooling tower fans upon chiller activation.

f. Upon request to start the chiller, the control system shall start the chilled water pump and verify chilled water flow. The controller shall then start the cooling water pump and verify interlock signal, before starting tower fan(s), absorbent pump and refrigerant pump.

g. The control system shall automatically sense impending abnormalities in the absorption operating cycle and take the following actions to either self-correct and/or limit the machine from approaching cycle crystallization line:
   1) Close hot water control valve for a set period.
   2) Stop the operation of the machine after performing a dilution cycle if the solution concentration is still over the pre-set level.

→ h. The rate at which the accessory hot water control valve is opened shall be precisely controlled.

i. The control system shall automatically cycle the refrigerant pump whenever the leaving chilled water temperature falls below the desired set point. The chilled water pump shall remain on and when the leaving chilled water temperature rises above the set point, the refrigerant pump shall automatically restart.

j. The control center shall allow reset of the chiller water temperature set point based upon any one of the following criteria:
   1) Chilled water reset based on an external 4 to 20 mA signal.
   2) Chilled water reset based on cooling water inlet temperature.

k. When the stop button is pressed or remote contacts open the control center shall immediately drive the hot water control valve to the closed position and initiate the normal shutdown sequence including dilution cycle. The display shall indicate that the machine is in the dilution cycle.

2. Safeties:
   a. Unit shall automatically shut down when any of the following conditions occur. In addition, the chiller goes into alarm mode and indicates the reason for the shutdown on the chiller data display.
      1) Absorbent pump motor overload.
      2) Refrigerant pump motor overload.
      3) Purge pump motor overload.
      4) Low chilled water temperature.
      5) Low cooling water temperature.
      6) Generator high temperature.
      7) Generator high pressure.
      8) Loss of chilled water flow.
      9) (Optional) loss of cooling water flow.
      10) Loss of chilled water pump interlock.
      11) Loss of cooling water pump interlock.
      12) High solution concentration.
   b. The control system shall detect conditions that approach protective limits and take self-corrective action prior to an alarm occurring. The system shall automatically reduce chiller capacity when any of the following parameters are outside their normal operating range:
      1) Low cooling water inlet temperature.
      2) High cooling water inlet temperature.
      3) High solution concentration.

3. Diagnostics and Service:
   a. The chiller control system shall execute a series of self-diagnostic checks whenever power is first turned on to determine if temperatures are within pre-start limits, thereby allowing start-up to proceed. If any of the

limits are exceeded, an alert message will be displayed, informing the operator of the cause of the pre-start alert.

b. The control system shall provide an alarm display on the front of the panel for any sensor that has failed. These sensors include:
   1) Chilled water inlet temperature.
   2) Chilled water outlet temperature.
   3) Cooling water inlet temperature.
   4) Cooling water outlet temperature.
   5) Cooling water intermediate temperature.
   6) Hot water inlet temperature.
   7) Hot water outlet temperature.
   8) Condenser temperature.
   9) Refrigerant temperature.
   10) Diluted solution temperature.
   11) Generator temperature.
   12) Purge tank pressure.
   13) Steam condensate temperature.

c. The chiller controls shall display maintenance messages and alarms when efficient operation of the chiller is in jeopardy or when immediate attention is necessary. When operating conditions are predicted to be problematic, the following messages shall be displayed on the panel:
   1) Purge tank high pressure.
   2) Cooling water tubes excessive fouling.
   3) Cooling water high temperature.
   4) Power failure.

4. Building Control System Interface:

   The chiller control system shall have the ability to interface and communicate directly to the building control system with additional field-installed hardware and software.

G. Electrical Requirements:

1. Power supply to the unit shall be 3 ph, 60 Hz with voltages of 208 or 460 as specified on the equipment schedule. A control transformer shall provide 24-volt single-phase secondary power for the control panel.
2. Contractor/owner shall supply and install the electrical power line and all auxiliary electrical protection devices per local code requirements and as indicated necessary by the chiller manufacturer.
3. Contractor/owner shall supply and install electrical wiring and devices required to interface the chiller controls with the building controls system if applicable.

H. Piping Requirements:

1. Piping and instrumentation for the chilled water, cooling water and hot water shall be supplied and installed by the contractor/owner.
2. Absorber-condenser crossover piping shall be furnished by the chiller manufacturer.
3. Cooling water flow switch shall be supplied by either the chiller manufacturer or the contractor/owner.
4. Piping from the rupture disk shall be provided and installed by the contractor/owner and piped in accordance with the chiller manufacturer's written instructions and any local jurisdictional requirements.

I. Thermal Insulation:

Insulation of the evaporator, refrigerant pump, sump, piping and chilled water headers, in addition to any hot surfaces shall be field supplied and installed on the machine. Chiller manufacturer shall recommend the material and specify surface area to be insulated.

J. Sound Level:

The overall sound pressure level of the chiller shall not exceed 80 dbA when measured per ARI Standard 575-1994.

K. Start-up:

1. Unit manufacturer shall provide a factory-trained service representative, employed by the chiller manufacturer, to perform and/or supervise chiller pressure test (when required), charge chiller with refrigerant (water) and lithium bromide solution, place unit into operation, and calibrate all controls in accordance with the manufacturer's written start-up, operating and maintenance instructions.
2. After unit start-up has been performed, the same factory representative shall be available for a period of instruction not to exceed 4 hours to instruct the owner's personnel in the proper start-up, operating and maintenance procedures.
3. Manufacturer shall provide the following documentation and literature:
   a. Installation Instructions.
   b. Start-Up, Operating and Maintenance Instructions.
   c. Dimensional Drawing.
   d. Foundation Drawing.
   e. Field Wiring Diagram.

L. Options and Accessories:

1. Marine Waterboxes:

   Marine waterboxes with removable covers to facilitate tube cleaning and maintenance shall be furnished when specified on the equipment schedule.

2. High-Pressure Waterboxes:

   Waterboxes rated for 300 psig working pressure with removable covers shall be furnished when specified on the equipment schedule.

3. Special Tubing:

   Tubing of non-standard materials, geometry or wall thickness shall be provided when specified on the equipment schedule.

Guide specifications (cont)

4. Shipping Configuration:

   Chiller shall ship either fully assembled or in multiple pieces as specified on the equipment schedule.

5. Victaulic Nozzle Connections:

   Victaulic grooves shall be provided on all waterbox nozzle connections when specified on the equipment schedule.

6. Cooling Water Flow Switch:

   Cooling water flow switch, rated for either 150 psig or 300 psig, shall be factory supplied when specified on the equipment schedule.

7. Isolation Package:

   A vibration isolation package consisting of neoprene isolation pads shall be furnished when specified on the equipment schedule.

8. Thermometer Set:

   A package of 5 adjustable angle thermometers shall be factory-supplied for field installation when specified on the equipment schedule. Each shall have a 9 in. scale with a working range of 0° F to 120 F and shall be equipped with a ¾-in. NPT brass well.

→ 9. Hot Water Control Valve:

   An accessory hot water control valve shall be provided when specified on the equipment schedule.

Appendix D

Utility Bills

Present Electric 1,109.98

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 04/30/2015 **Service To:** 05/29/2015 **Billing Days:** 30 **Avg KWH/Day:** 5,512
Rate: General Service Secondary 3 Phase **Measured Load:** 400.3 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L013639669	4,311	4,518	165,354 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01F

Customer Charge					**10.10**
Basic Generation Service	165,354 KWH	x	0.007844		**1,297.04**
BGS Energy Charge - Hourly Pricing					**7,401.73**
BGS Capacity Charge	637.8 KW	x	0.272625		**5,216.41**
BGS Reconciliation Charge	165,354 KWH	x	0.000215		**35.55**
CIEP-Standby Fee	165,354 KWH	x	0.000161		**26.62**
Non-Utility Generation Charges	165,354 KWH	x	0.004096		**677.29**
Societal Benefits Charges	330,708 KWH	x	0.003633		**1,201.46**
Delivery Service Charges					
	165,354 KWH	x	0.004598	760.32	
	400.3 KW	x	5.859855	2,345.70	
Total Delivery Service Charges				**3,106.02**	**3,106.02**
RGGI Recovery Charge	165,354 KWH	x	0.000124		**20.50**
System Control Charge	165,354 KWH	x	0.000055		**9.09**
other	165,354 KWH	x	0.002274		**376.01**
Present Electric					**19,377.82**

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 05/30/2015 **Service To:** 06/30/2015 **Billing Days:** 32 **Avg KWH/Day:** 6,140
Rate: General Service Secondary 3 Phase **Metered Load:** 427.7 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L013639669	4,518	4,764	196,482 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01F

Customer Charge					**10.10**
Basic Generation Service	196,481 KWH	x	0.007844		**1,541.20**
BGS Energy Charge - Hourly Pricing					**7,349.96**
BGS Capacity Charge					
	637.8 KW	x	0.272625	347.76	
	523.6 KW	x	0.265799	4,175.17	
Total BGS Capacity Charge				**4,522.93**	**4,522.93**
BGS Reconciliation Charge					
	10,471 KWH	x	0.000215	2.25	
	186,010 KWH	x	-0.000077	-14.32	
Total BGS Reconciliation Charge				**-12.07**	**-12.07**
CIEP-Standby Fee	196,481 KWH	x	0.000161		**31.63**
Non-Utility Generation Charges	196,481 KWH	x	0.004096		**804.79**
Societal Benefits Charges	392,962 KWH	x	0.003633		**1,427.63**
Delivery Service Charges					
	196,481 KWH	x	0.004551	894.13	
	427.7 KW	x	5.869488	2,510.38	
Total Delivery Service Charges				**3,404.51**	**3,404.51**
RGGI Recovery Charge	196,481 KWH	x	0.000124		**24.36**
System Control Charge	196,481 KWH	x	0.000055		**10.81**
other	196,481 KWH	x	0.002274		**446.80**
					19,562.65

Present Electric 1,060.39

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 07/01/2015 **Service To:** 07/30/2015 **Billing Days:** 30 **Avg KWH/Day:** 6,574
Rate: General Service Secondary 3 Phase **Metered Load:** 457.9 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L013639869	4,764	5,010	197,206 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01F

Customer Charge						**10.10**
Basic Generation Service	197,207	KWH	x	0.007844		**1,546.89**
BGS Energy Charge - Hourly Pricing						**8,183.12**
BGS Capacity Charge	523.6	KW	x	0.265799		**4,175.17**
BGS Reconciliation Charge	197,207	KWH	x	-0.000077		**-15.18**
CIEP-Standby Fee	197,207	KWH	x	0.000161		**31.75**
Non-Utility Generation Charges	197,207	KWH	x	0.004096		**807.76**
Societal Benefits Charges	394,414	KWH	x	0.003633		**1,432.91**
Delivery Service Charges						
	197,207	KWH	x	0.004550	897.25	
	457.9	KW	x	5.878751	2,691.88	
Total Delivery Service Charges					**3,589.13**	**3,589.13**
RGGI Recovery Charge	197,207	KWH	x	0.000124		**24.45**
System Control Charge	197,207	KWH	x	0.000055		**10.85**
other	197,207	KWH	x	0.002274		**448.45**

Present Electric 717.18

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 10/01/2015 **Service To:** 10/30/2015 **Billing Days:** 30 **Avg KWH/Day:** 4,656
Rate: General Service Secondary 3 Phase **Measured Load:** 378.7 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L015753494	337	511	139,673 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01F

Customer Charge					**10.10**
Basic Generation Service	139,673 KWH	x	0.007840		**1,095.04**
BGS Energy Charge - Hourly Pricing					**4,877.81**
BGS Capacity Charge	523.6 KW	x	0.265799		**4,175.17**
BGS Reconciliation Charge	139,673 KWH	x	0.000131		**18.30**
CIEP-Standby Fee	139,673 KWH	x	0.000161		**22.49**
Non-Utility Generation Charges	139,673 KWH	x	0.004096		**572.10**
Societal Benefits Charges	279,346 KWH	x	0.003746		**1,046.29**
Delivery Service Charges					
	139,673 KWH	x	0.004624	645.90	
	378.7 KW	x	5.461870	2,068.41	
Total Delivery Service Charges				**2,714.31**	**2,714.31**
RGGI Recovery Charge	139,673 KWH	x	0.000124		**17.32**
System Control Charge	139,673 KWH	x	0.000055		**7.68**
other	139,673 KWH	x	0.002274		**317.62**

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 10/31/2015 **Service To:** 12/02/2015 **Billing Days:** 33 **Avg KWH/Day:** 4,261
Rate: General Service Secondary 3 Phase **Measured Load:** 381.6 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L015753494	511	687	140,602 KWH	Actual	600

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01D

Customer Charge					**10.10**
CIEP-Standby Fee	140,602 KWH	x	0.000161		**22.64**
Non-Utility Generation Charges	140,602 KWH	x	0.004096		**575.91**
Societal Benefits Charges	281,204 KWH	x	0.003746		**1,053.25**
Delivery Service Charges					
	140,602 KWH	x	0.004622	649.89	
	381.6 KW	x	5.462998	2,084.68	
Total Delivery Service Charges				**2,734.57**	**2,734.57**
RGGI Recovery Charge	140,602 KWH	x	0.000124		**17.43**
System Control Charge	140,602 KWH	x	0.000055		**7.73**
other	140,602 KWH	x	0.002274		**319.73**
Generation Related Component	0 KWH	x	0.000000		**12,491.07**

Present Electric **545.08**

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042448 **Portion:** C80 **Service From:** 12/03/2015 **Service To:** 12/31/2015 **Billing Days:** 29 **Avg KWH/Day:** 3,787
Rate: General Service Secondary 3 Phase **Measured Load:** 293.8 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L015753494	687	824	109,822 KWH	Actual	800

Customer Number: 0801382783 0000042448 - General Service Secondary 3 Phase - JC_GS3_01D

Customer Charge						**10.10**
CIEP-Standby Fee	109,822	KWH	x	0.000161		**17.68**
Non-Utility Generation Charges	109,822	KWH	x	0.004096		**449.83**
Societal Benefits Charges	219,644	KWH	x	0.003746		**822.68**
Delivery Service Charges						
	109,822	KWH	x	0.004713	517.57	
	293.8	KW	x	5.419061	1,592.12	
Total Delivery Service Charges					**2,109.69**	**2,109.69**
RGGI Recovery Charge	109,822	KWH	x	0.000124		**13.62**
System Control Charge	109,822	KWH	x	0.000055		**6.04**
other	109,822	KWH	x	0.002274		**249.74**
Generation Related Component	0	KWH	x	0.000000		**9,756.58**

Present Electric 586.96

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C60 **Service From:** 01/01/2016 **Service To:** 02/01/2016 **Billing Days:** 32 **Avg KWH/Day:** 3,616
Rate: General Service Secondary 3 Phase **Measured Load:** 272.2 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L015753494	824	869	115,700 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01D

Customer Charge					**10.10**
CIEP-Standby Fee	115,700 KWH	x	0.000161		**18.63**
Non-Utility Generation Charges	115,700 KWH	x	0.004096		**473.91**
Societal Benefits Charges	231,400 KWH	x	0.003746		**866.71**
Delivery Service Charges					
	115,700 KWH	x	0.004682	542.84	
	272.2 KW	x	5.403894	1,470.94	
Total Delivery Service Charges				**2,013.78**	**2,013.78**
RGGI Recovery Charge	115,700 KWH	x	0.000124		**14.35**
System Control Charge	115,700 KWH	x	0.000055		**6.36**
other	115,700 KWH	x	0.002274		**263.10**
Generation Related Component	0 KWH	x	0.000000		**10,278.76**

Present Electric

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 02/02/2016 **Service To:** 02/29/2016 **Billing Days:** 28 **Avg KWH/Day:** 3,765
Rate: General Service Secondary 3 Phase **Measured Load:** 273.6 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L015753494	969	1,101	105,415 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01D

Customer Charge					**10.10**
CIEP-Standby Fee	105,415 KWH	x	0.000161		**16.97**
Non-Utility Generation Charges	105,415 KWH	x	0.004096		**431.78**
Societal Benefits Charges	210,830 KWH	x	0.003745		**789.66**
Delivery Service Charges					
	105,415 KWH	x	0.004730	498.62	
	273.6 KW	x	5.404971	1,478.80	
Total Delivery Service Charges				**1,977.42**	**1,977.42**
RGGI Recovery Charge	105,415 KWH	x	0.000124		**13.07**
System Control Charge	105,415 KWH	x	0.000055		**5.80**
other	105,415 KWH	x	0.002274		**239.71**
Generation Related Component	0 KWH	x	0.000000		**9,365.06**

Present Electric **672.52**

Account Number: 100 017 422 278 **Service Address:** O C ENERGY COUNCIL COURT HOUSE SQUARE TOMS RIVER NJ 08757
Premise: 0000042446 **Portion:** C80 **Service From:** 03/31/2016 **Service To:** 04/28/2016 **Billing Days:** 29 **Avg KWH/Day:** 3,892
Rate: General Service Secondary 3 Phase **Measured Load:** 362.9 **KVAR:** 0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L015753494	1,242	1,383	112,855 KWH	Actual	800

Customer Number: 0801382793 0000042446 - General Service Secondary 3 Phase - JC_GS3_01D

Customer Charge					**10.10**
CIEP-Standby Fee	112,855 KWH	x	0.000161		**18.17**
Non-Utility Generation Charges	112,855 KWH	x	0.004096		**462.26**
Societal Benefits Charges	225,710 KWH	x	0.003746		**845.40**
Delivery Service Charges					
	112,855 KWH	x	0.004702	530.60	
	362.9 KW	x	5.455415	1,979.77	
Total Delivery Service Charges				**2,510.37**	**2,510.37**
RGGI Recovery Charge	112,855 KWH	x	0.000124		**13.99**
System Control Charge	112,855 KWH	x	0.000055		**6.21**
other	112,855 KWH	x	0.002274		**256.63**
Generation Related Component	0 KWH	x	0.000000		**10,072.17**

Present Electric **19,349.35**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 05/20/2015 **Service To:** 06/18/2015 **Billing Days:** 30 **Avg KWH/Day:** 12,064
Rate: General Service Primary **Measured Load On/Off:** 666.9/625.9 **KVAR On/Off:** 412.8/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	8,466	8,558	146,926 ONKWH	Actual	1,600
L97024394	12,394	12,528	215,005 OFFKWH	Actual	1,600
L97024394			361,933 KWH		
L97024394			0 KWH		

Customer Number: 0801382783 0000629868 - General Service Primary - JC_GP__01F

Customer Charge					**48.54**
Basic Generation Service	361,932 KWH	x	0.005805		**2,101.02**
BGS Energy Charge - Hourly Pricing					**13,028.77**
BGS Capacity Charge					
	1,032.2 KW	x	0.272625	3,376.84	
	968.9 KW	x	0.265799	4,635.59	
Total BGS Capacity Charge				**8,012.43**	**8,012.43**
BGS Reconciliation Charge					
	140,410 KWH	x	0.000215	30.19	
	221,522 KWH	x	-0.000077	-17.06	
Total BGS Reconciliation Charge				**13.13**	**13.13**
CIEP-Standby Fee	361,932 KWH	x	0.000161		**58.27**
Delivery Charges	412.8 KVAR	x	0.370000		**152.74**
Non-Utility Generation Charges	361,932 KWH	x	0.003886		**1,406.47**
Societal Benefits Charges	361,932 KWH	x	0.007266		**2,629.80**
Delivery Service Charges					
	361,932 KWH	x	0.003472	1,256.63	
	666.9 KW	x	5.650008	3,767.99	
Total Delivery Service Charges				**5,024.62**	**5,024.62**
RGGI Recovery Charge	361,932 KWH	x	0.000124		**44.88**
System Control Charge	361,932 KWH	x	0.000055		**19.91**
other	361,932 KWH	x	0.002274		**823.03**

Present Electric **33,363.61**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 05/20/2015 **Service To:** 06/18/2015 **Billing Days:** 30 **Avg KWH/Day:** 52
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382783 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	626 KWH	x	-0.003403	-2.13	
	940 KWH	x	0.000032	0.03	
Outdoor Lighting	626 KWH	x	0.060767	38.04	
Outdoor Lighting	1,566 KWH	x	0.003755	5.88	
Outdoor Lighting	940 KWH	x	0.060021	56.42	
Total Basic Generation Service				**98.24**	**98.24**
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007266		**11.38**
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		**70.58**
RGGI Recovery Charge	1,566 KWH	x	0.000124		**0.19**
System Control Charge	1,566 KWH	x	0.002331		**3.65**
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		**113.76**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 06/19/2015 **Service To:** 07/20/2015 **Billing Days:** 32 **Avg KWH/Day:** 12,645
Rate: General Service Primary **Measured Load On/Off:** 658.1/624.6 **KVAR On/Off:** 414.7/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	8,558	8,652	151,640 ONKWH	Actual	1,600
L97024394	12,528	12,687	252,987 OFFKWH	Actual	1,600
L97024394			404,627 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01F

Customer Charge					**48.54**
Basic Generation Service	404,627 KWH	x	0.005805		**2,348.88**
BGS Energy Charge - Hourly Pricing					**14,146.08**
BGS Capacity Charge	968.9 KW	x	0.265799		**8,241.04**
BGS Reconciliation Charge	404,627 KWH	x	-0.000077		**-31.16**
CIEP-Standby Fee	404,627 KWH	x	0.000161		**65.14**
Delivery Charges	414.7 KVAR	x	0.370000		**153.44**
Non-Utility Generation Charges	404,627 KWH	x	0.003886		**1,572.38**
Societal Benefits Charges	404,627 KWH	x	0.007266		**2,940.02**
Delivery Service Charges					
	404,627 KWH	x	0.003472	1,404.86	
	686.1 KW	x	5.650007	3,876.47	
Total Delivery Service Charges				**5,281.33**	**5,281.33**
RGGI Recovery Charge	404,627 KWH	x	0.000124		**50.17**
System Control Charge	404,627 KWH	x	0.000055		**22.25**
other	404,627 KWH	x	0.002274		**920.12**
Present Electric					**35,758.21**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 06/19/2015 **Service To:** 07/20/2015 **Billing Days:** 32 **Avg KWH/Day:** 48
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	1,566 KWH	x	0.000026	0.04	
Outdoor Lighting	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				**99.92**	**99.92**
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007266		**11.38**
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		**70.58**
RGGI Recovery Charge	1,566 KWH	x	0.000124		**0.19**
System Control Charge	1,566 KWH	x	0.000057		**0.09**
other	1,566 KWH	x	0.002274		**3.56**
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		**113.75**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 07/21/2015 **Service To:** 08/19/2015 **Billing Days:** 30 **Avg KWH/Day:** 13,045
Rate: General Service Primary **Measured Load On/Off:** 686.1/633.0 **KVAR On/Off:** 416.0/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	8,652	8,751	157,229 ONKWH	Actual	1,600
L97024394	12,687	12,833	234,131 OFFKWH	Actual	1,600
L97024394			391,360 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01F

Customer Charge					**48.64**
Basic Generation Service	391,359 KWH	x	0.005805		**2,271.84**
BGS Energy Charge - Hourly Pricing					**15,262.43**
BGS Capacity Charge	968.9 KW	x	0.265798		**7,725.98**
BGS Reconciliation Charge	391,359 KWH	x	-0.000077		**-30.13**
CIEP-Standby Fee	391,359 KWH	x	0.000161		**63.01**
Delivery Charges	416.0 KVAR	x	0.370000		**153.92**
Non-Utility Generation Charges	391,359 KWH	x	0.003886		**1,520.82**
Societal Benefits Charges	391,359 KWH	x	0.007266		**2,843.61**
Delivery Service Charges					
	391,359 KWH	x	0.003472	1,358.80	
	686.1 KW	x	5.650007	3,876.47	
Total Delivery Service Charges				**5,235.27**	**5,235.27**
RGGI Recovery Charge	391,359 KWH	x	0.000124		**48.53**
System Control Charge	391,359 KWH	x	0.000055		**21.52**
other	391,359 KWH	x	0.002274		**889.95**
Present Electric					**36,055.29**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 07/21/2015 **Service To:** 08/19/2015 **Billing Days:** 30 **Avg KWH/Day:** 52
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
Outdoor Lighting	1,566 KWH	x	0.000026	0.04	
	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				**99.92**	**99.92**
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007266		**11.38**
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		**70.58**
RGGI Recovery Charge	1,566 KWH	x	0.000124		**0.19**
System Control Charge	1,566 KWH	x	0.000057		**0.09**
other	1,566 KWH	x	0.002274		**3.56**
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		**113.76**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 08/20/2015 **Service To:** 09/18/2015 **Billing Days:** 30 **Avg KWH/Day:** 52
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	826 KWH	x	0.000032	0.02	
	940 KWH	x	-0.002564	-2.41	
Outdoor Lighting	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				97.49	97.49
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		6.41
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007266		11.38
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		70.58
RGGI Recovery Charge	1,566 KWH	x	0.000124		0.19
System Control Charge	1,566 KWH	x	0.000057		0.09
other	1,566 KWH	x	0.002274		3.56
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		113.76

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 08/20/2015 **Service To:** 09/18/2015 **Billing Days:** 30 **Avg KWH/Day:** 12,796
Rate: General Service Primary **Measured Load On/Off:** 679.0/834.2 **KVAR On/Off:** 421.1/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	6,751	8,847	154,957 ONKWH	Actual	1,600
L97024394	12,833	12,976	228,936 OFFKWH	Actual	1,600
L97024394			383,893 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01F

Customer Charge					**48.54**
Basic Generation Service					
	153,733 KWH	x	0.005805	892.42	
	230,160 KWH	x	0.005865	1,349.89	
Total Basic Generation Service				**2,242.31**	**2,242.31**
BGS Energy Charge - Hourly Pricing					**14,306.57**
BGS Capacity Charge	868.9 KW	x	0.265799		**7,725.98**
BGS Reconciliation Charge					
	153,733 KWH	x	-0.000077	-11.84	
	230,160 KWH	x	0.000131	30.15	
Total BGS Reconciliation Charge				**18.31**	**18.31**
CIEP-Standby Fee	383,893 KWH	x	0.000161		**61.81**
Delivery Charges	421.1 KVAR	x	0.370000		**155.81**
Non-Utility Generation Charges	383,893 KWH	x	0.003886		**1,491.81**
Societal Benefits Charges	383,893 KWH	x	0.007268		**2,789.37**
Delivery Service Charges					
	383,893 KWH	x	0.003472	1,332.88	
	679.0 KW	x	5.650000	3,836.35	
Total Delivery Service Charges				**5,169.23**	**5,169.23**
RGGI Recovery Charge	383,893 KWH	x	0.000124		**47.60**
System Control Charge	383,893 KWH	x	0.000055		**21.11**
other	383,893 KWH	x	0.002274		**872.97**
Present Electric					**34,961.42**

Present Electric 20,341.09

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 09/19/2015 **Service To:** 10/20/2015 **Billing Days:** 32 **Avg KWH/Day:** 11,100
Rate: General Service Primary **Measured Load On/Off:** 667.5/592.0 **KVAR On/Off:** 424.3/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	8,847	8,936	141,261 ONKWH	Actual	1,600
L97024394	12,976	13,110	213,936 OFFKWH	Actual	1,600
L97024394			355,197 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01F

Customer Charge					48.54
Basic Generation Service	355,196 KWH	x	0.005865		2,083.22
BGS Energy Charge - Hourly Pricing					12,946.65
BGS Capacity Charge	988.9 KW	x	0.265799		8,241.04
BGS Reconciliation Charge	355,196 KWH	x	0.000131		46.53
CIEP-Standby Fee	355,196 KWH	x	0.000161		57.19
Delivery Charges	424.3 KVAR	x	0.370000		156.99
Non-Utility Generation Charges	355,196 KWH	x	0.003886		1,380.29
Societal Benefits Charges					
	145,198 KWH	x	0.007266	1,055.01	
	209,998 KWH	x	0.007491	1,573.10	
Total Societal Benefits Charges				2,628.11	2,628.11
Delivery Service Charges					
	355,196 KWH	x	0.003472	1,233.24	
	667.5 KW	x	5.230007	3,491.03	
Total Delivery Service Charges				4,724.27	4,724.27
RGGI Recovery Charge	355,196 KWH	x	0.000124		44.04
System Control Charge	355,196 KWH	x	0.000055		19.54
other	355,196 KWH	x	0.002274		807.72
Present Electric					33,184.13

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 09/19/2015 **Service To:** 10/20/2015 **Billing Days:** 32 **Avg KWH/Day:** 49
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	1,566 KWH	x	-0.002561	-4.01	
Outdoor Lighting	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				95.87	95.87
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		6.41
Societal Benefits Charges					
Outdoor Lighting	587 KWH	x	0.007266	4.27	
Outdoor Lighting	979 KWH	x	0.007491	7.33	
Total Societal Benefits Charges				11.60	11.60
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		70.58
RGGI Recovery Charge	1,566 KWH	x	0.000124		0.19
System Control Charge	1,566 KWH	x	0.000057		0.09
other	1,566 KWH	x	0.002274		3.56
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		113.76
Present Electric					302.06

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 10/21/2015 **Service To:** 11/19/2015 **Billing Days:** 30 **Avg KWH/Day:** 10,658
Rate: General Service Primary **Measured Load On/Off:** 705.9/545.9 **KVAR On/Off:** 423.0/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	8,936	9,025	142,478 ONKWH	Actual	1,600
L97024394	13,110	13,221	177,275 OFFKWH	Actual	1,600
L97024394			319,753 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01F

Customer Charge					**48.54**
Basic Generation Service	319,754 KWH	x	0.005865		**1,875.36**
BGS Energy Charge - Hourly Pricing					**10,339.61**
BGS Capacity Charge	968.9 KW	x	0.265799		**7,725.98**
BGS Reconciliation Charge	319,754 KWH	x	0.000131		**41.89**
CIEP-Standby Fee	319,754 KWH	x	0.000161		**51.48**
Delivery Charges	423.0 KVAR	x	0.370000		**156.51**
Non-Utility Generation Charges	319,754 KWH	x	0.003886		**1,242.56**
Societal Benefits Charges	319,754 KWH	x	0.007491		**2,395.28**
Delivery Service Charges					
	319,754 KWH	x	0.003472	1,110.19	
	705.9 KW	x	5.230004	3,691.86	
Total Delivery Service Charges				**4,802.05**	**4,802.05**
RGGI Recovery Charge	319,754 KWH	x	0.000124		**39.65**
System Control Charge	319,754 KWH	x	0.000055		**17.59**
other	319,754 KWH	x	0.002274		**727.12**
Present Electric					**29,463.62**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 10/21/2015 **Service To:** 11/19/2015 **Billing Days:** 30 **Avg KWH/Day:** 52
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	1,566 KWH	x	-0.002561	-4.01	
Outdoor Lighting	1,566 KWH	x	0.063760	99.88	
Total Basic Generation Service				**95.87**	**95.87**
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007491		**11.73**
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		**70.58**
RGGI Recovery Charge	1,566 KWH	x	0.000124		**0.19**
System Control Charge	1,566 KWH	x	0.000057		**0.09**
other	1,566 KWH	x	0.002274		**3.56**
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		**113.76**

Present Electric

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 12/22/2015 **Service To:** 01/20/2016 **Billing Days:** 30 **Avg KWH/Day:** 9,657
Rate: General Service Primary **Measured Load On/Off:** 576.0/505.0 **KVAR On/Off:** 279.0/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	9,098	9,173	120,384 ONKWH	Actual	1,600
L97024394	13,332	13,438	169,614 OFFKWH	Actual	1,600
L97024394			289,998 KWH		
L97024394			0 KWH		

Customer Number: 0801382703 0000629868 - General Service Primary - JC_GP__01D

Customer Charge					**48.54**
CIEP-Standby Fee	289,998	KWH x	0.000161		**46.69**
Delivery Charges	279.0	KVAR x	0.370000		**103.23**
Non-Utility Generation Charges	289,998	KWH x	0.003886		**1,126.93**
Societal Benefits Charges	289,998	KWH x	0.007491		**2,172.38**
Delivery Service Charges					
	289,998	KWH x	0.003472	1,006.87	
	576.0	KW x	5.230000	3,012.48	
				4,019.35	**4,019.35**
Total Delivery Service Charges					**35.96**
RGGI Recovery Charge	289,998	KWH x	0.000124		**15.95**
System Control Charge	289,998	KWH x	0.000055		**659.46**
other	289,998	KWH x	0.002274		**24,212.55**
Generation Related Component	0	KWH x	0.000000		**32,441.04**

Present Electric

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 12/22/2015 **Service To:** 01/20/2016 **Billing Days:** 30 **Avg KWH/Day:** 52
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382703 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	1,566	KWH x	-0.002152	-3.37	
Outdoor Lighting	1,566	KWH x	0.063780	99.88	
Total Basic Generation Service				**96.51**	**96.51**
Non-Utility Generation Charges					
Outdoor Lighting	1,566	KWH x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566	KWH x	0.007491		**11.73**
Delivery Service Charges					
Outdoor Lighting	1,566	KWH x	0.045070		**70.58**
RGGI Recovery Charge	1,566	KWH x	0.000124		**0.19**
System Control Charge	1,566	KWH x	0.000057		**0.09**
other	1,566	KWH x	0.002274		**3.56**
Fixture Charges					
Outdoor Lighting Service	9	EA x	12.640000		**113.76**
Present Electric					**302.83**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 01/21/2016 **Service To:** 02/18/2016 **Billing Days:** 29 **Avg KWH/Day:** 10,158
Rate: General Service Primary **Measured Load On/Off:** 581.8/501.8 **KVAR On/Off:** 266.2/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	9,173	9,249	121,125 ONKWH	Actual	1,600
L97024394	13,436	13,546	173,453 OFFKWH	Actual	1,600
L97024394			294,578 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01D

Customer Charge					48.54
CIEP-Standby Fee	294,578 KWH	x	0.000161		47.43
Delivery Charges	266.2 KVAR	x	0.370000		98.49
Non-Utility Generation Charges	294,578 KWH	x	0.003885		1,144.73
Societal Benefits Charges	294,578 KWH	x	0.007491		2,206.68
Delivery Service Charges					
	294,578 KWH	x	0.003472	1,022.77	
	581.8 KW	x	5.229993	3,042.81	
Total Delivery Service Charges				4,065.58	4,065.58
RGGI Recovery Charge	294,578 KWH	x	0.000124		36.53
System Control Charge	294,578 KWH	x	0.000055		16.20
other	294,578 KWH	x	0.002274		669.87
Generation Related Component	0 KWH	x	0.000000		24,594.93
Present Electric					32,928.98

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 01/21/2016 **Service To:** 02/18/2016 **Billing Days:** 29 **Avg KWH/Day:** 54
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	1,566 KWH	x	-0.002152	-3.37	
Outdoor Lighting	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				96.51	96.51
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		6.41
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007491		11.73
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		70.58
RGGI Recovery Charge	1,566 KWH	x	0.000124		0.19
System Control Charge	1,566 KWH	x	0.000057		0.09
other	1,566 KWH	x	0.002274		3.56
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		113.76

Present Electric 16,216.94

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 02/19/2016 **Service To:** 03/18/2016 **Billing Days:** 29 **Avg KWH/Day:** 9,836
Rate: General Service Primary **Measured Load On/Off:** 569.0/487.0 **KVAR On/Off:** 269.4/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	9,249	9,322	116,674 ONKWH	Actual	1,600
L97024394	13,546	13,651	168,384 OFFKWH	Actual	1,600
L97024394			285,258 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01D

Customer Charge					**48.54**
CIEP-Standby Fee	285,258 KWH	x	0.000161		**45.93**
Delivery Charges	269.4 KVAR	x	0.370000		**99.68**
Non-Utility Generation Charges	285,258 KWH	x	0.003886		**1,108.51**
Societal Benefits Charges	285,258 KWH	x	0.007491		**2,136.87**
Delivery Service Charges					
	285,258 KWH	x	0.003472	990.42	
	569.0 KW	x	5.230000	2,975.87	
Total Delivery Service Charges				**3,966.29**	**3,966.29**
RGGI Recovery Charge	285,258 KWH	x	0.000124		**35.37**
System Control Charge	285,258 KWH	x	0.000055		**15.69**
other	285,258 KWH	x	0.002274		**648.68**
Generation Related Component	0 KWH	x	0.000000		**23,816.79**
Present Electric					**31,922.36**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 02/19/2016 **Service To:** 03/18/2016 **Billing Days:** 29 **Avg KWH/Day:** 54
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	594 KWH	x	-0.002155	-1.28	
	972 KWH	x	-0.000751	-0.73	
Outdoor Lighting	1,566 KWH	x	0.063760	99.88	
				97.87	97.87
Total Basic Generation Service					
Non-Utility Generation Charges					6.41
Outdoor Lighting	1,566 KWH	x	0.004096		
Societal Benefits Charges					11.73
Outdoor Lighting	1,566 KWH	x	0.007491		
Delivery Service Charges					70.58
Outdoor Lighting	1,566 KWH	x	0.045070		0.19
RGGI Recovery Charge	1,566 KWH	x	0.000124		0.09
System Control Charge	1,566 KWH	x	0.000057		3.56
other	1,566 KWH	x	0.002274		
Fixture Charges					113.76
Outdoor Lighting Service	9 EA	x	12.640000		

Present Electric **16,129.03**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 03/19/2016 **Service To:** 04/19/2016 **Billing Days:** 32 **Avg KWH/Day:** 9,082
Rate: General Service Primary **Measured Load On/Off:** 560.6/505.6 **KVAR On/Off:** 253.4/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	9,322	9,393	113,795 ONKWH	Actual	1,600
L97024394	13,651	13,762	176,814 OFFKWH	Actual	1,600
L97024394			290,609 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01D

Customer Charge					**48.54**
CIEP-Standby Fee	290,609 KWH	x	0.000161		**46.79**
Delivery Charges	253.4 KVAR	x	0.370000		**93.76**
Non-Utility Generation Charges	290,609 KWH	x	0.003886		**1,129.31**
Societal Benefits Charges	290,609 KWH	x	0.007491		**2,176.95**
Delivery Service Charges					
	290,609 KWH	x	0.003472	1,008.99	
	560.6 KW	x	5.230004	2,931.94	
Total Delivery Service Charges				**3,940.93**	**3,940.93**
RGGI Recovery Charge	290,609 KWH	x	0.000124		**36.04**
System Control Charge	290,609 KWH	x	0.000055		**15.98**
other	290,609 KWH	x	0.002274		**660.84**
Generation Related Component	0 KWH	x	0.000000		**24,263.66**
Present Electric					**32,412.70**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C80 **Service From:** 03/19/2016 **Service To:** 04/19/2016 **Billing Days:** 32 **Avg KWH/Day:** 49
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
	1,566 KWH	x	-0.000754	-1.18	
Outdoor Lighting	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				**98.70**	**98.70**
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007491		**11.73**
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		**70.58**
RGGI Recovery Charge	1,566 KWH	x	0.000124		**0.19**
System Control Charge	1,566 KWH	x	0.000057		**0.09**
other	1,566 KWH	x	0.002274		**3.56**
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		**113.76**
Present Electric					**305.02**

14,647.57

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0000629868 **Portion:** C80 **Service From:** 04/20/2016 **Service To:** 05/17/2016 **Billing Days:** 28 **Avg KWH/Day:** 9,909
Rate: General Service Primary **Measured Load On/Off:** 660.5/577.3 **KVAR On/Off:** 386.8/0.0

Meter Number	Previous MR	Current MR	Difference	Type of Reading	Multiplier
L97024394	9,393	9,466	116,949 ONKWH	Actual	1,600
L97024394	13,762	13,862	160,490 OFFKWH	Actual	1,600
L97024394			277,439 KWH		
L97024394			0 KWH		

Customer Number: 0801382793 0000629868 - General Service Primary - JC_GP__01D

Customer Charge					**48.54**
CIEP-Standby Fee	277,439 KWH	x	0.000161		**44.67**
Delivery Charges	396.8 KVAR	x	0.370000		**146.82**
Non-Utility Generation Charges	277,439 KWH	x	0.003886		**1,078.13**
Societal Benefits Charges	277,439 KWH	x	0.007491		**2,078.30**
Delivery Service Charges					
	277,439 KWH	x	0.003472	963.27	
	660.5 KW	x	5.230008	3,454.42	
Total Delivery Service Charges				**4,417.69**	**4,417.69**
RGGI Recovery Charge	277,439 KWH	x	0.000124		**34.40**
System Control Charge	277,439 KWH	x	0.000055		**15.26**
other	277,439 KWH	x	0.002274		**630.90**
Generation Related Component	0 KWH	x	0.000000		**23,267.87**
Present Electric					**31,762.58**

Account Number: 100 017 910 215 **Service Address:** 100 HOOPER AVE TOMS RIVER NJ 08753
Premise: 0005012591 **Portion:** C60 **Service From:** 04/20/2016 **Service To:** 05/17/2016 **Billing Days:** 28 **Avg KWH/Day:** 56
Rate: Outdoor Lighting Service **Measured Load:** 0.0 **KVAR:** 0.0

Description	Units	KWH/Unit	Total Qty
OL 400 watt SV flood light (174 kWh)	9	174	1,566

Customer Number: 0801382793 0005012591 - Outdoor Lighting Service - JC_OLS_02D

Basic Generation Service					
Outdoor Lighting	1,566 KWH	x	-0.000754	-1.18	
	1,566 KWH	x	0.063780	99.88	
Total Basic Generation Service				**98.70**	**98.70**
Non-Utility Generation Charges					
Outdoor Lighting	1,566 KWH	x	0.004096		**6.41**
Societal Benefits Charges					
Outdoor Lighting	1,566 KWH	x	0.007491		**11.73**
Delivery Service Charges					
Outdoor Lighting	1,566 KWH	x	0.045070		**70.58**
RGGI Recovery Charge	1,566 KWH	x	0.000124		**0.19**
System Control Charge	1,566 KWH	x	0.000057		**0.09**
other	1,566 KWH	x	0.002274		**3.56**
Fixture Charges					
Outdoor Lighting Service	9 EA	x	12.640000		**113.76**
Pressnt Electric					

Ocean County Energy Council
Billing Statements

Dates 5/30/2015 to 5/27/2016
Billing # 10-00-76-2401-6-5

Re: 118 Hooper Avenue

Utility Company	Date From	Date To	Usage	Current Charges
J C P & L	05/30/2015	06/30/2015	259987	8,118.71
	07/01/2015	07/30/2015	270648	27,028.21
	07/31/2015	08/31/2015	274516	27,194.58
	09/01/2015	09/30/2015	248645	26,124.46
	10/01/2015	10/30/2015	181274	19,085.19
	10/31/2015	12/02/2015	194096	21,671.68
	12/03/2015	12/31/2015	171146	19,203.06
	01/01/2016	02/01/2016	189488	20,995.27
	02/02/2016	02/29/2016	163354	18,307.36
	03/01/2016	03/30/2016	175862	19,966.79
	03/31/2016	04/28/2016	172045	19,696.90
	04/29/2016	05/27/2016	178289	21,016.11

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading

June 03, 2016

Account Number: 100 076 240 165

Amount Due: $21,016.11

Due Date: June 20, 2016

Billing Period: Apr 29 to May 27, 2016 for 29 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115 For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

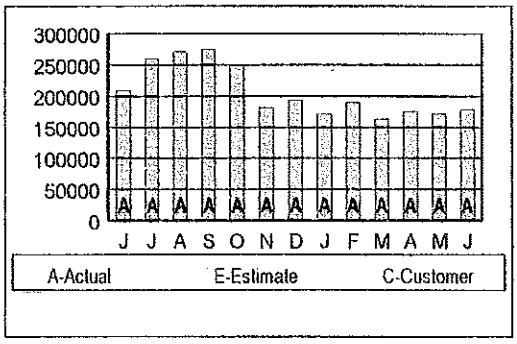
Your next meter reading is scheduled to occur on or about Jun 28, 2016.

Please conserve electricity. Higher summer rates are now in effect.

RECEIVED JUN - 6 2016

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	6962	6148
Average Daily Temperature	66	58
Days in Billing Period	30	29
Last 12 Months Use (KWH)		2,479,249
Average Monthly Use (KWH)		206,604

Account Summary

	Amount Due
Previous Balance	39,663.69
Payments/Adjustments	-39,663.69
Balance at Billing on Jun 03, 2016	**0.00**
JCP&L - Consumption	6,063.62
South Jersey Energy	14,952.49
Total Current Charges	**21,016.11**
Amount Due by Jun 20, 2016	**$21,016.11**

Usage Information for Meter Number L013649433

May 27, 2016 KWH Reading (Actual)	96,635.329
Apr 29, 2016 KWH Reading (Actual)	94,406.715
Difference	2,228.614
Multiplier	80
KWH used	178,289
Metered Load in KW	5.753
Billed Load in KW/KVA	460.2

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	178,289 KWH	x 0.000161	28.70
Delivery Charges	1,000 KWH	x 0.053760	53.76
	177,289 KWH	x 0.004299	762.17
	450.2 KW	x 6.010000	2,705.70
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	177,289 KWH	x 0.004096	726.18
Societal Benefits Charges	178,289 KWH	x 0.007491	1,335.56
RGGI Recovery Charge	178,289 KWH	x 0.000124	22.11
System Control Charge	178,289 KWH	x 0.000055	9.81
Storm Recovery Charge	178,289 KWH	x 0.002274	405.43
Current Consumption Bill Charges			**6,063.62**

Billing Information for South Jersey Energy

1 South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-266-6020
Account Number: 113296 Rate: BILL_READY

Billing Period: Apr 29, 2016 to May 27, 2016	
Generation: 178,289 Kwh @ $0.08387	14,952.49
Total South Jersey Energy Current Charges	**14,952.49**

Detail Payment and Adjustment Information

05/09/16 Payment	-19,966.79
05/23/16 Payment	-19,696.90
Total Payments and Adjustments	**-$39,663.69**

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	10,551.77	-10,551.77	6,063.62	6,063.62
South Jersey Energy	29,111.92	-29,111.92	14,952.49	14,952.49
Total	**39,663.69**	**-39,663.69**	**21,016.11**	**21,016.11**

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading

May 04, 2016

Account Number: 100 076 240 165

Amount Due: $39,663.69

Due Date: May 19, 2016

Billing Period: Mar 31 to Apr 28, 2016 for 29 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

When this bill was prepared, your account had an unpaid balance. If you have already made this payment, thank you. If not, please promptly pay the overdue amount. Call us if you have questions or for information on payment arrangements.

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about May 27, 2016.

For your safety, if your service has been disconnected, do not attempt to reconnect it. While this is illegal and could result in prosecution, removing a meter base or touching any of the wires can also cause death or serious injury through arcs of electricity, explosions or fire. Meters are only to be accessed by authorized utility personnel.

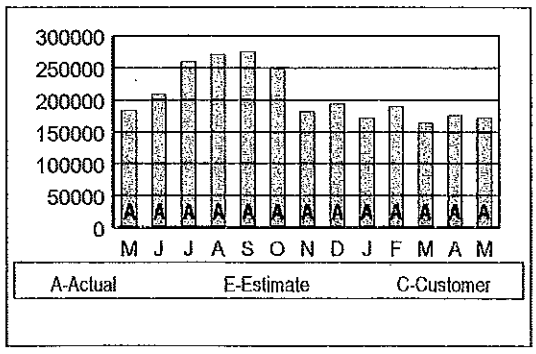
An important message to dog owners - to ensure that our meter readers' visits to your home are safe and productive, please keep your dog secured in an area away from the path to your meter.

All of our employees wear photo ID badges. Always ask for an employee's ID before letting anyone in your home. If you are still not sure, please call the company.

RECEIVED MAY - 6 2016

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	6117	5933
Average Daily Temperature	52	52
Days in Billing Period	30	29
Last 12 Months Use (KWH)		2,509,826
Average Monthly Use (KWH)		209,152

Account Summary

	Amount Due
Previous Balance	38,274.15
Payments/Adjustments	-18,307.36
Balance at Billing on May 04, 2016	**19,966.79**
JCP&L - Consumption	5,268.07
South Jersey Energy	14,428.83
Total Current Charges	**19,696.90**
Amount Due by May 19, 2016	**$39,663.69**

Usage Information for Meter Number L013849433

Apr 28, 2016 KWH Reading (Actual)	94,406.715
Mar 31, 2016 KWH Reading (Actual)	92,256.152
Difference	2,150.563
Multiplier	80
KWH used	172,045
Metered Load in KW	4.6475
Billed Load in KW/KVA	371.8

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	172,045 KWH	x 0.000161	27.70
Delivery Charges	1,000 KWH	x 0.049742	49.74
	171,045 KWH	x 0.004299	735.32
	361.8 KW	x 5.610000	2,029.70
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	171,045 KWH	x 0.004096	700.60
Societal Benefits Charges	172,045 KWH	x 0.007491	1,288.79
RGGI Recovery Charge	172,045 KWH	x 0.000124	21.33
System Control Charge	172,045 KWH	x 0.000055	9.46
Storm Recovery Charge	172,045 KWH	x 0.002274	391.23
Current Consumption Bill Charges			**5,268.07**

Billing Information for South Jersey Energy

1 South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-266-6020
Account Number: 113296 Rate: BILL_READY
Billing Period: Mar 31, 2016 to Apr 28, 2016

Generation: 172,045 Kwh @ $0.08387	14,428.83
Total South Jersey Energy Current Charges	**14,428.83**

Detail Payment and Adjustment Information

04/12/16 Payment	-18,307.36

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	9,952.29	-4,668.59	5,268.07	10,551.77
South Jersey Energy	28,321.86	-13,638.77	14,428.83	29,111.92
Total	**38,274.15**	**-18,307.36**	**19,696.90**	**39,663.69**

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading

April 07, 2016

Account Number: 100 076 240 165

Amount Due: $38,274.15

Due Date: April 22, 2016

Billing Period: Mar 01 to Mar 30, 2016 for 30 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

When this bill was prepared, your account had an unpaid balance. If you have already made this payment, thank you. If not, please promptly pay the overdue amount. Call us if you have questions or for information on payment arrangements.

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Apr 28, 2016.

Spring's warm weather often produces thunderstorms, which can cause power outages. If your power goes out, call 1-888-LIGHTSS (1-888-544-4877). For your safety, please treat all downed wires as live and dangerous. For more information on preparing for outages, visit www.firstenergycorp.com/storminfo.

Additional messages, if any, can be found on back.

Account Summary

	Amount Due
Previous Balance	39,302.63
Payments/Adjustments	-20,995.27
Balance at Billing on Apr 07, 2016	**18,307.36**
JCP&L - Consumption	5,283.70
South Jersey Energy	14,683.09
Total Current Charges	**19,966.79**
Amount Due by Apr 22, 2016	**$38,274.15**

Usage Information for Meter Number L013649433

Mar 30, 2016 KWH Reading (Actual)	92,256.152
Mar 01, 2016 KWH Reading (Actual)	90,057.872
Difference	2,198.28
Multiplier	80
KWH used	175,862
Metered Load in KW	4.525
Billed Load in KW/KVA	362.0

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	175,862 KWH	x 0.000161	28.31
Delivery Charges	1,000 KWH	x 0.049742	49.74
	174,862 KWH	x 0.004299	751.73
	352.0 KW	x 5.610000	1,974.72
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	174,862 KWH	x 0.004096	716.23
Societal Benefits Charges	175,862 KWH	x 0.007491	1,317.38
RGGI Recovery Charge	175,862 KWH	x 0.000124	21.81
System Control Charge	175,862 KWH	x 0.000055	9.67
Storm Recovery Charge	175,862 KWH	x 0.002274	399.91
Current Consumption Bill Charges			**5,283.70**

Billing Information for South Jersey Energy

One South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-756-3749
Account Number: 113296 Rate: BILL_READY

Billing Period: Mar 01, 2016 to Mar 30, 2016

Generation: 175,862 Kwh @ $0.08349	14,683.09
Total South Jersey Energy Current Charges	**14,683.09**

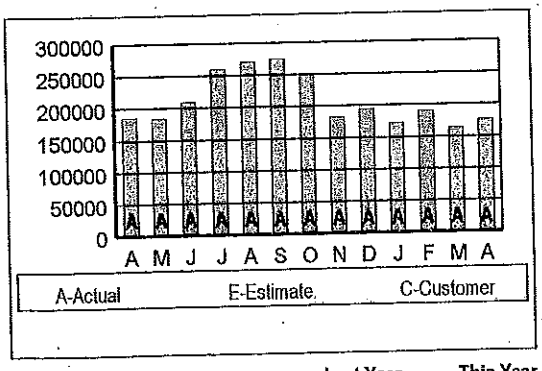
Detail Payment and Adjustment Information

03/07/16 Payment	-20,995.27

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	9,843.11	-5,174.52	5,283.70	9,952.29
South Jersey Energy	29,459.52	-15,820.75	14,683.09	28,321.86
Total	**39,302.63**	**-20,995.27**	**19,966.79**	**38,274.15**

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	5970	5862
Average Daily Temperature	36	48
Days in Billing Period	31	30
Last 12 Months Use (KWH)		2,521,287
Average Monthly Use (KWH)		210,107

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading

March 08, 2016

Billing Period: Feb 02 to Feb 29, 2016 for 28 days

Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

Account Number: 100 076 240 165

Amount Due: $39,302.63

Due Date: March 23, 2016

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com

Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

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Your next meter reading is scheduled to occur on or about Mar 30, 2016.

Additional messages, if any, can be found on back.

Account Summary

	Amount Due
Previous Balance	20,995.27
Payments/Adjustments	0.00
Balance at Billing on Mar 08, 2016	**20,995.27**
JCP&L - Consumption	4,668.59
South Jersey Energy	13,638.77
Total Current Charges	**18,307.36**
Amount Due by Mar 23, 2016	**$39,302.63**

Usage Information for Meter Number L013649433

Feb 29, 2016 KWH Reading (Actual)	90,057.872
Feb 02, 2016 KWH Reading (Actual)	88,015.95
Difference	2,041.922
Multiplier	80
KWH used	163,354
Metered Load in KW	3.67
Billed Load in KW/KVA	293.6

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	163,354 KWH	x 0.000161	26.30
Delivery Charges	1,000 KWH	x 0.049742	49.74
	162,354 KWH	x 0.004299	697.96
	283.6 KW	x 5.610000	1,591.00
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	162,354 KWH	x 0.004096	665.00
Societal Benefits Charges	163,354 KWH	x 0.007491	1,223.68
RGGI Recovery Charge	163,354 KWH	x 0.000124	20.26
System Control Charge	163,354 KWH	x 0.000055	8.98
Storm Recovery Charge	163,354 KWH	x 0.002274	371.47
Current Consumption Bill Charges			**4,668.59**

Billing Information for South Jersey Energy

One South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-756-3749
Account Number: 113296 Rate: BILL_READY

Billing Period: Feb 02, 2016 to Feb 29, 2016

Generation: 163,354 Kwh @ $0.08349	13,638.77
Total South Jersey Energy Current Charges	**13,638.77**

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	5,174.52	0.00	4,668.59	9,843.11
South Jersey Energy	15,820.75	0.00	13,638.77	29,459.52
Total	**20,995.27**	**0.00**	**18,307.36**	**39,302.63**

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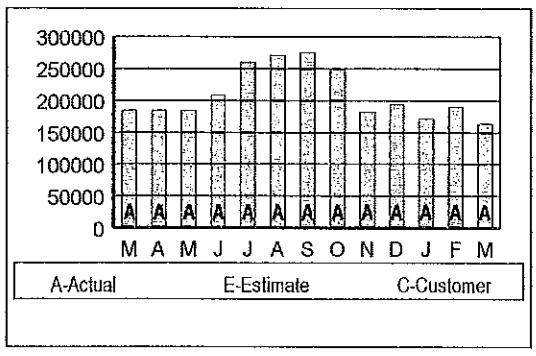
Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	6138	5834
Average Daily Temperature	23	36
Days in Billing Period	30	28
Last 12 Months Use (KWH)		2,530,483
Average Monthly Use (KWH)		210,874

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading

February 10, 2016
Account Number: 100 076 240 165
Amount Due: $20,995.27
Due Date: February 25, 2016

Billing Period: Jan 01 to Feb 01, 2016 for 32 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Feb 29, 2016.

VC0000006346 (AD001)

GAX070

VOUCHER # 273738

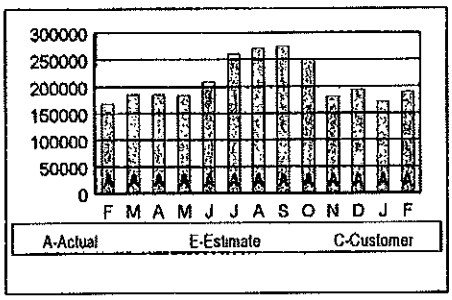
RECEIVED FEB 17 2016

2016
016-070-5677-3000

JC.

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	5619	5922
Average Daily Temperature	29	32
Days in Billing Period	30	32
Last 12 Months Use (KWH)		2,551,267
Average Monthly Use (KWH)		212,606

Account Summary

	Amount Due
Previous Balance	40,874.74
Payments/Adjustments	-40,874.74
Balance at Billing on Feb 10, 2016	**0.00**
JCP&L - Consumption	5,174.52
South Jersey Energy	15,820.75
Total Current Charges	**20,995.27**
Amount Due by Feb 25, 2016	**$20,995.27**

Usage Information for Meter Number L013649433

Feb 01, 2016 KWH Reading (Actual)	88,015.95
Jan 01, 2016 KWH Reading (Actual)	85,647.35
Difference	2,368.6
Multiplier	80
KWH used	189,488
Metered Load in KW	3.7205
Billed Load in KW/KVA	297.6

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	189,488 KWH	x 0.000161	30.51
Delivery Charges	1,000 KWH	x 0.049742	49.74
	188,488 KWH	x 0.004299	810.31
	287.6 KW	x 5.610000	1,613.44
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	188,488 KWH	x 0.004096	772.05
Societal Benefits Charges	189,488 KWH	x 0.007491	1,419.45
RGGI Recovery Charge	189,488 KWH	x 0.000124	23.50
System Control Charge	189,488 KWH	x 0.000055	10.42
Storm Recovery Charge	189,488 KWH	x 0.002274	430.90
Current Consumption Bill Charges			**5,174.52**

Billing Information for South Jersey Energy

One South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-756-3749
Account Number: 113296 Rate: BILL_READY

Billing Period: Jan 01, 2016 to Feb 01, 2016

Generation: 189,488 Kwh @ $0.08349	15,820.75
Total South Jersey Energy Current Charges	**15,820.75**

Detail Payment and Adjustment Information

01/29/16 Payment	-21,671.68
02/08/16 Payment	-19,203.06
Total Payments and Adjustments	**-$40,874.74**

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	10,379.92	-10,379.92	5,174.52	5,174.52
South Jersey Energy	30,494.82	-30,494.82	15,820.75	15,820.75
Total	**40,874.74**	**-40,874.74**	**20,995.27**	**20,995.27**

SH.

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading

January 11, 2016
Account Number: 100 076 240 165

Amount Due: $40,874.74

Due Date: January 26, 2016

Billing Period: Dec 03 to Dec 31, 2015 for 29 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE/ 118 Hooper Avenue
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

When this bill was prepared, your account had an unpaid balance. If you have already made this payment, thank you. If not, please promptly pay the overdue amount. Call us if you have questions or for information on payment arrangements.

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Feb 01, 2016.

RECEIVED JAN 13 2016

Additional messages, if any, can be found on back.

Account Summary

	Amount Due
Previous Balance	21,671.68
Payments/Adjustments	0.00
Balance at Billing on Jan 11, 2016	**21,671.68**
JCP&L - Consumption	4,913.72
South Jersey Energy	14,289.34
Total Current Charges	**19,203.06**
Amount Due by Jan 26, 2016	**$40,874.74**

Usage Information for Meter Number L013649433

Dec 31, 2015 KWH Reading (Actual)	85,647.35
Dec 03, 2015 KWH Reading (Actual)	83,508.031
Difference	2,139.319
Multiplier	80
KWH used	171,146
Metered Load in KW	3.895
Billed Load in KW/KVA	311.6

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	171,146 KWH	x 0.000161	27.55
Delivery Charges	1,000 KWH	x 0.049742	49.74
	170,146 KWH	x 0.004299	731.46
	301.6 KW	x 5.610000	1,691.98
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	170,146 KWH	x 0.004096	696.92
Societal Benefits Charges	171,146 KWH	x 0.007491	1,282.05
RGGI Recovery Charge	171,146 KWH	x 0.000124	21.22
System Control Charge	171,146 KWH	x 0.000055	9.41
Storm Recovery Charge	171,146 KWH	x 0.002274	389.19
Current Consumption Bill Charges			**4,913.72**

Billing Information for South Jersey Energy

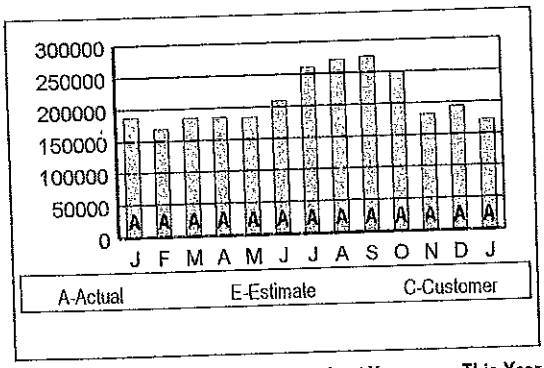
One South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-756-3749
Account Number: 113296 Rate: BILL_READY

Billing Period: Dec 03, 2015 to Dec 31, 2015	
Generation: 171146 @ $0.08349	14,289.34
Total South Jersey Energy Current Charges	**14,289.34**

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	5,466.20	0.00	4,913.72	10,379.92
South Jersey Energy	16,205.48	0.00	14,289.34	30,494.82
Total	**21,671.68**	**0.00**	**19,203.06**	**40,874.74**

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	5648	5902
Average Daily Temperature	40	49
Days in Billing Period	33	29
Last 12 Months Use (KWH)		2,530,350
Average Monthly Use (KWH)		210,863

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading, Rebill

Page 1 of 4
V62

December 10, 2015

Account Number: 100 076 240 165

Amount Due: $21,671.68

Due Date: December 28, 2015

Billing Period: Oct 31 to Dec 02, 2015 for 33 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill Issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Dec 31, 2015.

Best wishes for a joyous holiday season from all of us at JCP&L.

(VC0000006346 (AD001)

G4X070

VOUCHER # 269964

RECEIVED DEC 14 2015

2015

016-070-5677-3000

JC.

Additional messages, if any, can be found on back.

Account Summary

	Amount Due
Previous Balance	45,209.65
Payments/Adjustments	-45,209.65
Balance at Billing on Dec 10, 2015	**0.00**
JCP&L - Consumption	5,466.20
South Jersey Energy	16,205.48
Total Current Charges	**21,671.68**
Amount Due by Dec 28, 2015	**$21,671.68**

Usage Information for Meter Number L013849433

Dec 02, 2015 KWH Reading (Actual)	83,508.031
Oct 31, 2015 KWH Reading (Actual)	81,081.827
Difference	2,426.204
Multiplier	80
KWH used	194,096
Metered Load in KW	4.1795
Billed Load in KW/KVA	334.4

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	194,096 KWH	x 0.000161	31.25
Delivery Charges	1,000 KWH	x 0.049742	49.74
	193,096 KWH	x 0.004299	830.12
	324.4 KW	x 5.610000	1,819.88
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	193,096 KWH	x 0.004096	790.92
Societal Benefits Charges	194,096 KWH	x 0.007491	1,453.97
RGGI Recovery Charge	194,096 KWH	x 0.000124	24.07
System Control Charge	194,096 KWH	x 0.000055	10.68
Storm Recovery Charge	194,096 KWH	x 0.002274	441.37
Current Consumption Bill Charges			**5,466.20**

Billing Information for South Jersey Energy

One South Jersey Plaza, Folsom, NJ 08037
Customer Service: 1-800-756-3749
Account Number: 113296 Rate: BILL_READY

Billing Period: Oct 31, 2015 to Dec 02, 2015

Generation: 194096 @ $0.08349	16,205.48
Total South Jersey Energy Current Charges	**16,205.48**

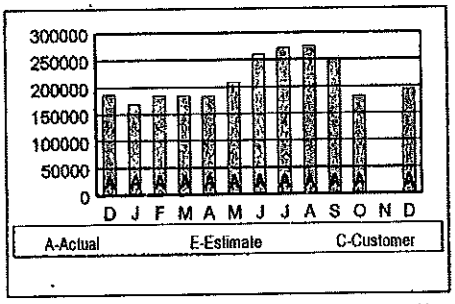
Detail Payment and Adjustment Information

11/10/15 Payment	-26,124.46
11/23/15 Payment	-19,085.19
Total Payments and Adjustments	**-$45,209.65**

Account Balances by Company

	Previous Balance	Payments/ Adjustments	Current Charges	Amount Due
JCP&L	45,209.65	-45,209.65	5,466.20	5,466.20
South Jersey Energy	0.00	0.00	16,205.48	16,205.48
Total	**45,209.65**	**-45,209.65**	**21,671.68**	**21,671.68**

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	0	5882
Average Daily Temperature		50
Days in Billing Period		33
Last 11 Months Use (KWH)		2,359,204
Average Monthly Use (KWH)		214,473

CS.

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading, Prorated Bill

November 04, 2015

Account Number: 100 076 240 165

Amount Due: $45,209.65

Due Date: November 19, 2015

Billing Period: Oct 01 to Oct 30, 2015 for 30 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

When this bill was prepared, your account had an unpaid balance. If you have already made this payment, thank you. If not, please promptly pay the overdue amount. Call us if you have questions or for information on payment arrangements.

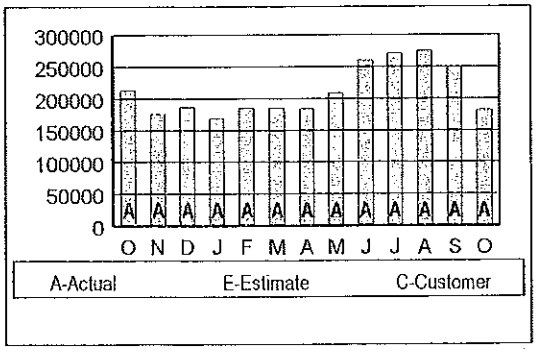
Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Dec 02, 2015.

RECEIVED NOV - 6 2015

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	6654	6042
Average Daily Temperature	59	55
Days in Billing Period	32	30
Last 12 Months Use (KWH)		2,527,114
Average Monthly Use (KWH)		210,593

Account Summary

	Amount Du
Previous Balance	53,319.(
Payments/Adjustments	-27,194.5
Balance at Billing on Nov 04, 2015	**26,124.4**
JCP&L - Consumption	19,085.19
Amount Due by Nov 19, 2015	**$45,209.6**

Usage Information for Meter Number L013649433

Oct 30, 2015 KWH Reading (Actual)	81,081.8
Oct 01, 2015 KWH Reading (Actual)	78,815.9(
Difference	2,265.9
Multiplier	1
KWH used	181,2
Metered Load in KW	5.2
Billed Load in KW/KVA	418

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01F

Customer Charge			10.
BGS Transmission Charges	181,274 KWH	x 0.007840	1,421.
BGS Energy Charge - Hourly Pricing			6,271.(
BGS Capacity Charge	710.5 KW	x 0.265799 x 30.00	5,665.5
BGS Reconciliation Charge	181,274 KWH	x 0.000131	23.
CIEP-Standby Fee	181,274 KWH	x 0.000161	29.
Delivery Charges	1,000 KWH	x 0.049742	49.
	180,274 KWH	x 0.004299	775.(
	408.9 KW	x 5.610000	2,293.9
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.
	180,274 KWH	x 0.004096	738.
Societal Benefits Charges	181,274 KWH	x 0.007491	1,357.9
RGGI Recovery Charge	181,274 KWH	x 0.000124	22.
System Control Charge	181,274 KWH	x 0.000055	9.9
Storm Recovery Charge	181,274 KWH	x 0.002274	412.
Current Consumption Bill Charges			**19,085.**

Detail Payment and Adjustment Information

10/12/15 Payment	-27,194.5

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading, Prorated Bill

Page 1 of 4
V62

October 06, 2015

Account Number: 100 076 240 165

Amount Due: $53,319.04

Due Date: October 21, 2015

Billing Period: Sep 01 to Sep 30, 2015 for 30 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill Issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

When this bill was prepared, your account had an unpaid balance. If you have already made this payment, thank you. If not, please promptly pay the overdue amount. Call us if you have questions or for information on payment arrangements.

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Your next meter reading is scheduled to occur on or about Oct 30, 2015.

VC0000006346 (AD001)

GAX070

VOUCHER # 263865

QUE

016-070-5677-3000

Account Summary

	Amount Due
Previous Balance	54,222.79
Payments/Adjustments	-27,028.21
Balance at Billing on Oct 08, 2015	**27,194.58**
JCP&L - Consumption	26,124.48
Amount Due by Oct 21, 2015	**$53,319.04**

Usage Information for Meter Number L013649433

Sep 30, 2015 KWH Reading (Actual)	78,815.905
Sep 01, 2015 KWH Reading (Actual)	75,707.837
Difference	3,108.068
Multiplier	80
KWH used	248,645
Metered Load in KW	6.856
Billed Load in KW/KVA	548.5

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01F

Customer Charge				10.10
BGS Transmission Charges	248,645 KWH	x 0.007840		1,949.38
BGS Energy Charge - Hourly Pricing				10,856.48
BGS Capacity Charge	710.5 KW	x 0.265799	x 30.00	5,665.51
BGS Reconciliation Charge	248,645 KWH	x 0.000131		32.57
CIEP-Standby Fee	248,645 KWH	x 0.000161		40.03
Delivery Charges	1,000 KWH	x 0.049742		49.74
	247,645 KWH	x 0.004299		1,064.63
	538.5 KW	x 5.610000		3,020.99
Non-Utility Generation Charges	1,000 KWH	x 0.004096		4.10
	247,645 KWH	x 0.004096		1,014.35
Societal Benefits Charges	248,645 KWH	x 0.007266		1,806.65
RGGI Recovery Charge	248,645 KWH	x 0.000124		30.83
System Control Charge	248,645 KWH	x 0.000055		13.68
Storm Recovery Charge	248,645 KWH	x 0.002274		565.42
Current Consumption Bill Charges				**26,124.48**

Detail Payment and Adjustment Information

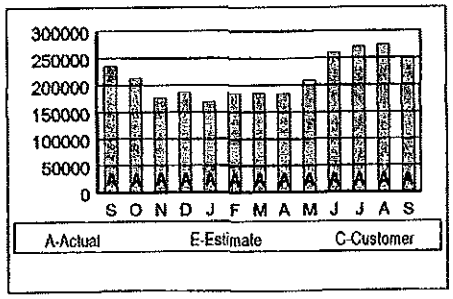
09/08/15 Payment	-27,028.21

RECEIVED OCT 0 8 2015

JC.

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	7830	8288
Average Daily Temperature	67	70
Days in Billing Period	30	30
Last 12 Months Use (KWH)		2,558,770
Average Monthly Use (KWH)		213,231

MS.

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading, Prorated Bill

September 04, 2015

Account Number: 100 076 240 165

Amount Due: $54,222.79

Due Date: September 21, 2015

Billing Period: Jul 31 to Aug 31, 2015 for 32 days

Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com

Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

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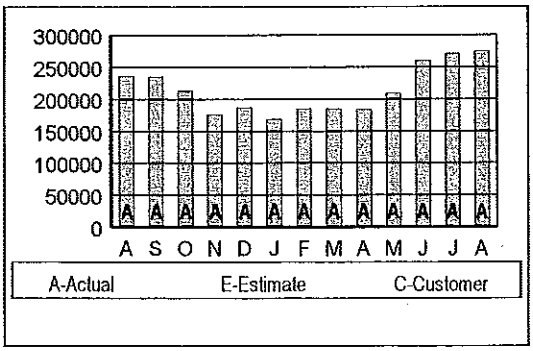
Your next meter reading is scheduled to occur on or about Sep 30, 2015.

Before purchasing a natural gas-powered generator to serve as a backup during power outages, please call your natural gas provider to ensure your meter and service line can support the additional usage. The natural gas provider can advise you of any required upgrades and additional costs.

RECEIVED SEP - 8 2015

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	8143	8579
Average Daily Temperature	71	75
Days in Billing Period	29	32
Last 12 Months Use (KWH)		2,545,022
Average Monthly Use (KWH)		212,085

Account Summary

	Amount Due
Previous Balance	35,146.92
Payments/Adjustments	-8,118.71
Balance at Billing on Sep 04, 2015	**27,028.21**
JCP&L - Consumption	**27,194.58**
Amount Due by Sep 21, 2015	**$54,222.79**

Usage Information for Meter Number L013649433

Aug 31, 2015 KWH Reading (Actual)	75,707.837
Jul 31, 2015 KWH Reading (Actual)	72,276.395
Difference	3,431.442
Multiplier	80
Kilowatt Hours Metered	274,515
Metered Load in KW	6.496
KILOWATT HOURS BILLED	274,516
BILLED LOAD IN KW/KVA	519.7

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01F

Customer Charge				10.10
BGS Transmission Charges	274,516 KWH	x 0.007844		2,153.30
BGS Energy Charge - Hourly Pricing				10,879.56
BGS Capacity Charge	710.5 KW	x 0.265799	x 32.00	6,043.21
BGS Reconciliation Charge	274,516 KWH	x -0.000077		-21.14
CIEP-Standby Fee	274,516 KWH	x 0.000161		44.20
Delivery Charges	1,000 KWH	x 0.053760		53.76
	273,516 KWH	x 0.004299		1,175.85
	509.7 KW	x 6.010000		3,063.30
Non-Utility Generation Charges	1,000 KWH	x 0.004096		4.10
	273,516 KWH	x 0.004096		1,120.32
Societal Benefits Charges	274,516 KWH	x 0.007266		1,994.63
RGGI Recovery Charge	274,516 KWH	x 0.000124		34.04
System Control Charge	274,516 KWH	x 0.000055		15.10
Storm Recovery Charge	274,516 KWH	x 0.002274		624.25
Current Consumption Bill Charges				**27,194.58**

Detail Payment and Adjustment Information

08/12/15 Payment	-8,118.71

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading, Prorated Bill

August 05, 2015

Account Number: 100 076 240 165

Amount Due: $35,146.92

Due Date: August 20, 2015

Billing Period: Jul 01 to Jul 30, 2015 for 30 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

**** REMINDER NOTICE ****

When this bill was prepared, your account had an unpaid balance. If you have already made this payment, thank you. If not, please promptly pay the overdue amount. Call us if you have questions or for information on payment arrangements.

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Aug 31, 2015.

An important message to dog owners - to ensure that our meter readers' visits to your home are safe and productive, please keep your dog secured in an area away from the path to your meter.

RECEIVED AUG 12 2015

Account Summary

	Amount Due
Previous Balance	8,118.71
Payments/Adjustments	0.00
Balance at Billing on Aug 05, 2015	**8,118.71**
JCP&L - Consumption	27,028.21
Amount Due by Aug 20, 2015	**$35,146.92**

Usage Information for Meter Number L013649433

Jul 30, 2015 KWH Reading (Actual)	72,276.395
Jul 01, 2015 KWH Reading (Actual)	68,893.297
Difference	3,383.098
Multiplier	80
KWH used	270,648
Metered Load in KW	6.66
Billed Load in KW/KVA	532.8

Charges From JCP&L

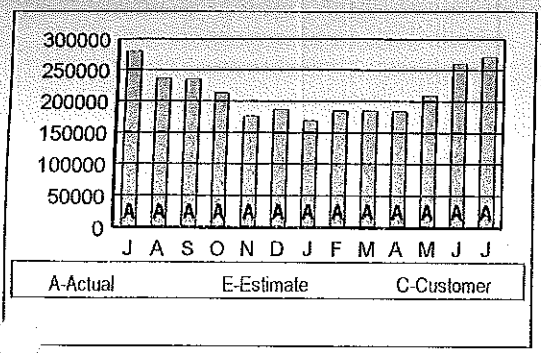
When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01F

Customer Charge			10.10
BGS Transmission Charges	270,648 KWH	x 0.007844	2,122.96
BGS Energy Charge - Hourly Pricing			11,112.89
BGS Capacity Charge	710.5 KW	x 0.265799 x 30.00	5,665.51
BGS Reconciliation Charge	270,648 KWH	x -0.000077	-20.84
CIEP-Standby Fee	270,648 KWH	x 0.000161	43.57
Delivery Charges	1,000 KWH	x 0.053760	53.76
	269,648 KWH	x 0.004299	1,159.22
	522.8 KW	x 6.010000	3,142.03
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	269,648 KWH	x 0.004096	1,104.48
Societal Benefits Charges	270,648 KWH	x 0.007266	1,966.53
RGGI Recovery Charge	270,648 KWH	x 0.000124	33.56
System Control Charge	270,648 KWH	x 0.000055	14.89
Storm Recovery Charge	270,648 KWH	x 0.002274	615.45
Current Consumption Bill Charges			**27,028.21**

SIGN HERE

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	8756	9022
Average Daily Temperature	75	76
Days in Billing Period	32	30
Last 12 Months Use (KWH)		2,506,668
Average Monthly Use (KWH)		208,889

Jersey Central Power & Light
A FirstEnergy Company

Bill Based On: Actual Meter Reading, Prorated Bill

July 07, 2015

Account Number: 100 076 240 165

Amount Due: $8,118.71

Due Date: July 22, 2015

Billing Period: May 30 to Jun 30, 2015 for 32 days
Bill For: OCEAN CNTY ROAD DEPT
129 HOOPER AVE
TOMS RIVER NJ 08753

Paid Completely

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-662-3115. For Payment Options, call 1-800-962-0383. Pay your bill online at www.firstenergycorp.com
Bill Issued by: JCP&L, PO Box 16001, Reading PA 19612-6001

Messages

Se dispone de avisos de terminación en español Mensaje de cuenta. Los usuarios que poseen un balance de cuenta vencido reciben un aviso por correo indicando que se les puede suspender el suministro de electricidad. Si usted necesita recibir esos avisos en español, haga el favor de llamarnos al 1-800-662-3115.

Your next meter reading is scheduled to occur on or about Jul 30, 2015.

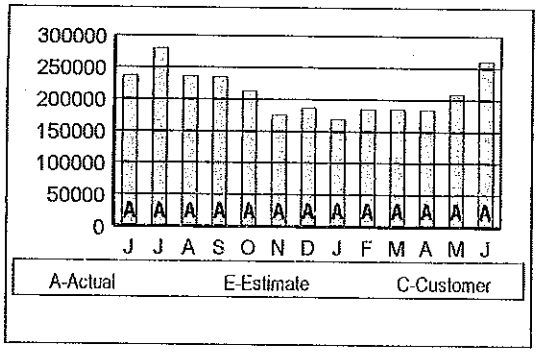
Tree branches and shrubs -- and insects that nest in vegetation -- can make it difficult and, at times, unsafe for our employees to read your meter. Please be sure your meter is easily accessible by clearing the path to it and the area around it.

The New Jersey Board of Public Utilities (BPU) approved a net decrease in JCP&L's rates effective with service rendered on or after April 1, 2015. The overall rate decrease reflected on this bill includes a charge to recover the costs associated with major storms, including Hurricane Sandy. For now, this storm recovery charge will be combined with the "System Control Charge." After June 1, 2015, the charge will be listed separately on your bill as "Storm Recovery Charge."

RECEIVED JUL - 9 2015

Additional messages, if any, can be found on back.

Usage History



Comparisons	Last Year	This Year
Average Daily Use (KWH)	7890	8121
Average Daily Temperature	70	72
Days in Billing Period	30	32
Last 12 Months Use (KWH)		2,516,215
Average Monthly Use (KWH)		209,685

Account Summary

	Amount Due
Previous Balance	6,595.52
Payments/Adjustments	-6,595.52
Balance at Billing on Jul 07, 2015	**0.00**
JCP&L - Consumption	8,118.71
Amount Due by Jul 22, 2015	**$8,118.71**

Usage Information for Meter Number L013649433

Jun 30, 2015 KWH Reading (Actual)	68,893.297
May 30, 2015 KWH Reading (Actual)	65,644.71
Difference	3,248.587
Multiplier	80
KWH used	259,887
Metered Load in KW	7.009
Billed Load in KW/KVA	560.7

Charges From JCP&L

When contacting an Electric Generation Supplier, please provide the following.
Customer Number: 0801241882 0006515839
Rate: General Service Secondary 3 Phase JC_GS3_01D

Customer Charge			10.10
CIEP-Standby Fee	259,887 KWH	x 0.000161	41.84
Delivery Charges	1,000 KWH	x 0.053760	53.76
	258,887 KWH	x 0.004299	1,112.96
	550.7 KW	x 6.010000	3,309.71
Non-Utility Generation Charges	1,000 KWH	x 0.004096	4.10
	258,887 KWH	x 0.004096	1,060.40
Societal Benefits Charges	259,887 KWH	x 0.007266	1,888.34
RGGI Recovery Charge	259,887 KWH	x 0.000124	32.23
System Control Charge	259,887 KWH	x 0.000055	14.29
Storm Recovery Charge	259,887 KWH	x 0.002274	590.98
Current Consumption Bill Charges			**8,118.71**

Charges from Direct Energy Business Marketing, LLC

1001 Liberty Avenue, Pittsburgh PA 15222
1-800-925-9115

Billing Period: May 30, 2015 to Jun 30, 2015
This supplier is responsible for billing your generation charges on a separate bill.

Detail Payment and Adjustment Information

06/22/15 Payment -6,595.52

Ocean County Energy Council
Billing Statements

Dates 3/24/2015 to 5/24/2016
Billing # 19-4510-0047-12

Re: 120 Hooper Avenue

Utility Company	Date From	Date To	Usage	Current Charges
NJNG	03/24/2015	04/22/2015	17810	18,036.61
	04/22/2015	05/22/2015	12510	13,058.33
	05/22/2015	06/23/2015	8650	9,580.28
	06/23/2015	07/28/2015	7100	8,707.18
	07/28/2015	08/22/2015	5480	4,549.47
	08/22/2015	09/22/2015	7360	5,927.51
	09/22/2015	10/22/2015	10730	7,395.85
	10/22/2015	11/20/2015	11860	7,887.86
	11/20/2015	12/23/2015	18980	11,056.03
	12/23/2015	01/22/2016	22550	12,631.68
	01/22/2016	02/22/2016	27080	14,656.45
	02/22/2016	03/22/2016	16220	9,783.13
	03/22/2016	04/25/2016	14060	8,821.15
	04/25/2016	05/24/2016	10700	7,333.84

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 09/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS 800 - GAS - LEAK
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$18,604.28
BILL TYPE Monthly 206CNA2G		DUE DATE May 12, 2016
CURRENT METER READING IS Actual Read	RECEIVED MAY - 3 2016 9HBR	SHOWS PAYMENTS RECEIVED BY April 27, 2016
NEXT SCHEDULED READING On or about May 24	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Mar 22	Apr 25	00851442	124227	- 122821 =	14060	x 1.064 =	14,962.65	8,821.15

Amount From Last Bill	9,783.13
Past Due Amount	9,783.13
This Period Gas Charge	8,821.15
Total Amount Due	$18,604.28

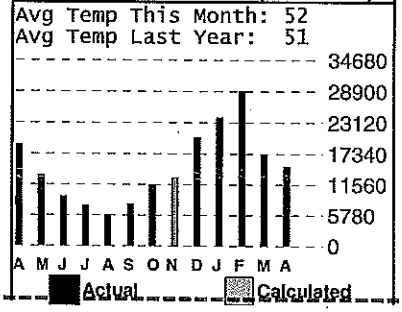
REMINDER: The past due amount has not been received. Payment is due immediately

Save time, save money - pay online at njng.com
Looking for a unique present? Give an NJNG gift certificate. For a certificate call NJNG at 800-221-0051.

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
14,962.65 Therms X .4182DEL	=	6,257.38
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		$8,821.15

USE COMPARISON (THERMS)



BUDGET OPTION

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$9,783.13	$8,821.15	May 12, 2016	$18,604.28

Make checks payable to NJNG.

Amount Paid $

00050132000059010001000111100

00577191
00059 01 SP 0.465 001 060
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

194510004712 00376468000186042800009783130000000004

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS 800 - GAS - LEAK
(800 - 427 - 5325)
Rate-related filings and public notices are available at www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$9,783.13
BILL TYPE Monthly 206CNA2G		DUE DATE April 13, 2016
CURRENT METER READING IS Actual Read	9HBR	SHOWS PAYMENTS RECEIVED BY March 29, 2016
NEXT SCHEDULED READING On or about Apr 25	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Feb 22	Mar 22	00851442	122821	121199	16220 x	1.064 =	17,262.95	9,783.13

RECEIVED APR - 4 2016

Amount From Last Bill	14,656.45
Mar 23 Payment - Thank You	14,656.45-
Balance Forward	.00
This Period Gas Charge	9,783.13
Total Amount Due	$9,783.13

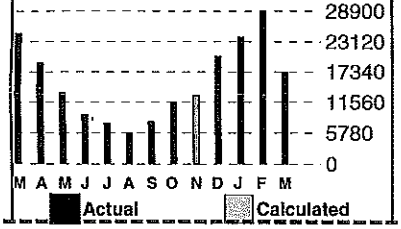
Want more conservation tips and offers? Sign up for our free E-Tips service by visiting My Account at njng.com
At New Jersey Natural Gas, SAFETY is our top priority. For more information, visit njng.com and click on My Safety.

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
17,262.95 Therms X .4182DEL	=	7,219.36
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		$9,783.13

USE COMPARISON (THERMS)

Avg Temp This Month: 47
Avg Temp Last Year: 35



BUDGET OPTION $15,847.00

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$.00	$9,783.13	April 13, 2016	$9,783.13

Make checks payable to NJNG.

Amount Paid $ 9,783.13

00577191
00060 01 SP 0.485 001 061
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

00493660006001000100111010

19451000471200376468000097831300000000000015847001

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$14,656.45
BILL TYPE Monthly 206CNA2G		DUE DATE March 12, 2016
CURRENT METER READING IS Actual Read	9HBR	SHOWS PAYMENTS RECEIVED BY February 26, 2016
NEXT SCHEDULED READING On or about Mar 24	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Jan 22	Feb 22	00851442	121199	118491 =	27080 x	1.068 =	28,916.02	14,656.45

Amount From Last Bill	23,687.71
Feb 02 Payment - Thank You	11,056.03-
Feb 25 Payment - Thank You	12,631.68-
Balance Forward	.00
This Period Gas Charge	14,656.45
Total Amount Due	$14,656.45

RECEIVED MAR - 3 2016

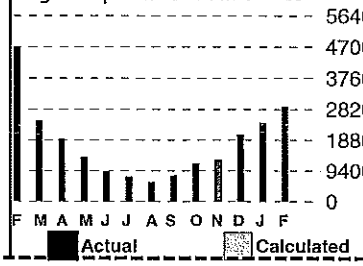
Save time, save money - pay online at njng.com
NJNG's Budget Plan is free and easy to join. Just pay the budget option & any other non-gas charges before the due date.

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
28,916.02 Therms X .4182DEL	=	12,092.68
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		14,656.45

USE COMPARISON (THERMS)

Avg Temp This Month: 36
Avg Temp Last Year: 25



BUDGET OPTION $15,847.00

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$.00	$14,656.45	March 12, 2016	$14,656.45

Make checks payable to NJNG.

Amount Paid $ 14656.45

00577191
00110 01 SP 0.485 001 110
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

0004858700011001000100011110

19451000471200376468000146564500000000000000158470004

New Jersey Natural Gas
1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER 19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	**TOTAL AMOUNT DUE** $23,687.71
BILL TYPE Monthly 206CNA2G		**DUE DATE** February 11, 2016
CURRENT METER READING IS Actual Read	9HBR	**SHOWS PAYMENTS RECEIVED BY** January 27, 2016
NEXT SCHEDULED READING On or about Feb 24	**SERVICE ADDRESS** HOOPER AV TR SHERIFF ST	**PLEASE READ REVERSE SIDE**

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS		100'S OF CUBIC FEET USED (CCF)		BTU CONTENT		BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Dec 23	Jan 22	00851442	118491	116236	=	22550	x	1.068	=	24,074.38	12,631.68

Amount From Last Bill	11,056.03
Past Due Amount	11,056.03
This Period Gas Charge	12,631.68
Total Amount Due	$23,687.71

REMINDER: The past due amount has not been received. Payment is due immediately

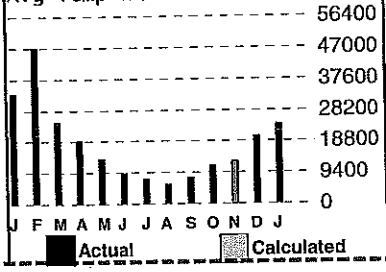
Need help paying your utility bill? Call 211 or visit nj211.org for information and eligibility requirements.
When winter weather hits, remember to clear a path to your natural gas meter and keep the meter free of snow and ice.

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
24,074.38 Therms X .4182DEL	=	10,067.91
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		12,631.68

USE COMPARISON (THERMS)

Avg Temp This Month: 40
Avg Temp Last Year: 34



BUDGET OPTION

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$11,056.03	$12,631.68	February 11, 2016	$23,687.71

Make checks payable to NJNG.

Amount Paid $

00047817000096010001000111110

00577191
00096 01 SP 0.485 001 097
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 0815

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER 19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	**TOTAL AMOUNT DUE** $11,056.03
BILL TYPE Monthly 206CNA2G		**DUE DATE** January 12, 2016
CURRENT METER READING IS Actual Read	9HBR	**SHOWS PAYMENTS RECEIVED BY** December 28, 2015
NEXT SCHEDULED READING On or about Jan 25	**SERVICE ADDRESS** HOOPER AV TR SHERIFF ST	**PLEASE READ REVERSE SIDE**

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS		100'S OF CUBIC FEET USED (CCF)		BTU CONTENT		BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Nov 20	Dec 23	00851442	116236	114338	=	18980	x	1.070	=	20,306.70	11,056.03

RECEIVED JAN - 4 2016

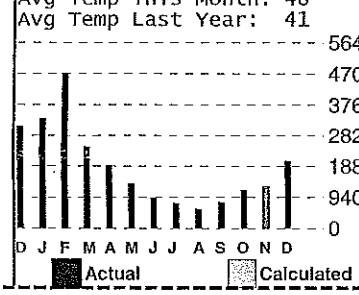
Amount From Last Bill	15,283.71
Nov 30 Payment - Thank You	7,395.85-
Dec 28 Payment - Thank You	7,887.86-
Balance Forward	.00
This Period Gas Charge	11,056.03
Total Amount Due	$11,056.03

If your service is turned off in the winter months,water pipes and fixtures must be drained to avoid freeze-ups.
Sign up for text and e-mail alerts at My Communications at njng.com.

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
20,306.70 Therms X .4182DEL	=	8,492.26
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		11,056.03

USE COMPARISON (THERMS)



BUDGET OPTION $15,847.00

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$.00	$11,056.03	January 12, 2016	$11,056.03

Make checks payable to NJNG.

Amount Paid $

00577191
00110 01 SP 0.485 001 112
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

000470 00110010001000111100

194510004712 00376468000110560300000000000015847008

New Jersey Natural Gas
1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$15,283.71
BILL TYPE Monthly 206CNA2G		DUE DATE December 09, 2015
CURRENT METER READING IS Calculated	9HBR	SHOWS PAYMENTS RECEIVED BY November 24, 2015
NEXT SCHEDULED READING On or about Dec 23	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Oct 22	Nov 20	00851442	114338	113152	= 11860	x 1.074	= 12,736.45	7,887.86

Amount From Last Bill	13,323.36
Oct 29 Payment - Thank You	5,927.51-
Past Due Amount	7,395.85
This Period Gas Charge	7,887.86
Total Amount Due	$15,283.71

RECEIVED DEC - 2 2015

REMINDER: The past due amount has not been received. Payment is due immediately

Visit Save Energy & Money at njng.com for tools to help you lower your energy bills
E-Bill is here. And, it's FREE. Sign up at My Account at njng.com then click "Register for E-Bill."

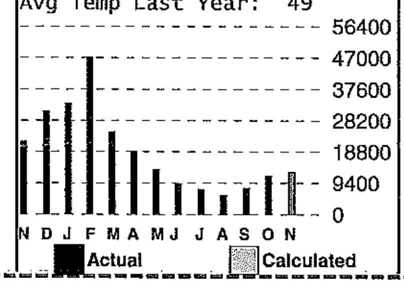
BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
8,915.52 Therms X .4182 DEL	=	3,728.47
3,820.94 Therms X .4176 DEL	=	1,595.62
GSL Trans Customer Chg	=	40.00

THIS SERVICE PERIOD GAS CHARGES $7,887.86

USE COMPARISON (THERMS)

Avg Temp This Month: 57
Avg Temp Last Year: 49



BUDGET OPTION

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$7,395.85	$7,887.86	December 09, 2015	$15,283.71

Make checks payable to NJNG.

Amount Paid $ 7887 86

00046283 0064010001000001110

00577191
00064 01 SP 0.485 001 067
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

194510004712 0037646800015283710000739585000000000007

New Jersey Natural Gas
1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS 800 - GAS - LEAK
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$13,323.36
BILL TYPE Monthly 206CNA2G	RECEIVED OCT 30 2015	DUE DATE November 10, 2015
CURRENT METER READING IS Actual Read		SHOWS PAYMENTS RECEIVED BY October 26, 2015
NEXT SCHEDULED READING On or about Nov 20	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Sep 22	Oct 22	00851442	113152	112079	10730	1.072	11,505.78	7,395.85

Amount From Last Bill	10,476.98
Sep 25 Payment - Thank You	4,549.47-
Past Due Amount	5,927.51
This Period Gas Charge	7,395.85
Total Amount Due	$13,323.36

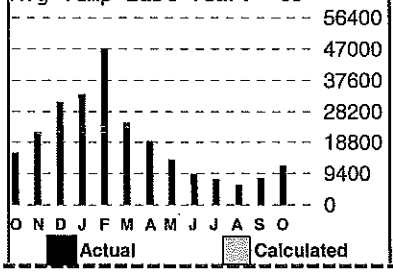
REMINDER: The past due amount has not been received. Payment is due immediately

Visit Save Energy & Money at njng.com for tools to help you lower your energy bills
Prevent the Silent Killer. Practice Carbon Monoxide Safety. See Bill Insert

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
8,054.05 Therms X .4176 DEL	=	3,363.37
3,451.73 Therms X .4255 DEL	=	1,468.71
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		$7,395.85

USE COMPARISON (THERMS)



BUDGET OPTION

OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$5,927.51	$7,395.85	November 10, 2015	$13,323.36

Make checks payable to NJNG.

Amount Paid $ 7395.85

00045510 00780100010001110

00577191
00078 01 SP 0.485 001 081
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

19451000471200376468000133233600005927510000000000

New Jersey Natural Gas
1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS 800 - GAS - LEAK
(800 - 427 - 5325)
Rate-related filings and public notices are available at www.njng.com/regulatory

ACCOUNT NUMBER 19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	TOTAL AMOUNT DUE $10,476.98
BILL TYPE Monthly 206CNA2G		DUE DATE October 09, 2015
CURRENT METER READING IS Actual Read		SHOWS PAYMENTS RECEIVED BY September 24, 2015
NEXT SCHEDULED READING On or about Oct 22	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS		100'S OF CUBIC FEET USED (CCF)		BTU CONTENT		BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Aug 22	Sep 22	00851442	112079	111343	=	7360	x	1.074	=	7,905.38	5,927.51

Amount From Last Bill	13,256.65
Aug 27 Payment - Thank You	8,707.18-
Past Due Amount	4,549.47
This Period Gas Charge	5,927.51
Total Amount Due	$10,476.98

REMINDER: The past due amount has not been received. Payment is due immediately

School's open. Please drive safely.

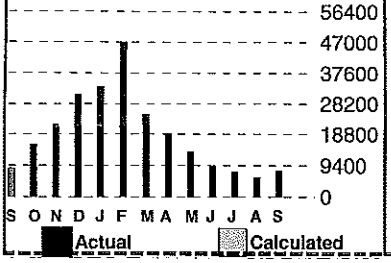
NJNG's Budget Plan is free and easy to join. Just pay the budget option & any other non-gas charges before the due date.

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
7,905.38 Therms X .4255 DEL	=	3,363.74
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		$5,927.51

USE COMPARISON (THERMS)

Avg Temp This Month: 75
Avg Temp Last Year: 71



BUDGET OPTION OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$4,549.47	$5,927.51	October 09, 2015	$10,476.98

Make checks payable to NJNG.

Amount Paid $

00044731 08801000100011010

00577191
00088 01 SP 0.485 001 088
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

19451000471200376468000104769800004549470000000005

BILLTYPE18 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$13,256.65
BILL TYPE Monthly 206CNA2G		DUE DATE September 09, 2015
CURRENT METER READING IS Actual Read		SHOWS PAYMENTS RECEIVED BY August 25, 2015
NEXT SCHEDULED READING On or about Sep 22	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)		BTU CONTENT		BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Jul 28	Aug 22	00851442	111343	110795	5480	x	1.072	=	5,871.82	4,549.47

Amount From Last Bill	8,707.18
Past Due Amount	8,707.18
This Period Gas Charge	4,549.47
Total Amount Due	$13,256.65

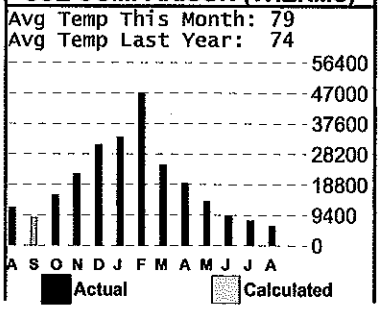
REMINDER: The past due amount has not been received. Payment is due immediately

August is the start of the Budget Plan year. Join now and spread your estimated natural gas costs over 12 months.
Remember to Follow us on Twitter and Like us on Facebook.

BILL CALCULATION

GSL Transport Demand Charge	=	2,019.01
5,871.82 Therms X .4255 DEL	=	2,498.46
GSL Trans Customer Chg	=	32.00
THIS SERVICE PERIOD GAS CHARGES		$4,549.47

USE COMPARISON (THERMS)



BUDGET OPTION

OTHER CHARGES

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ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$8,707.18	$4,549.47	September 09, 2015	$13,256.65

Make checks payable to NJNG.

Amount Paid $

00577191
00088 01 SP 0.485 001 088
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

00043955000088010001000011100

194510004712 00376468000132566500008707180000000000

New Jersey Natural Gas
1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE16 09/10

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS 800 - GAS - LEAK
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$8,707.18
BILL TYPE Monthly 206M		DUE DATE August 12, 2015
CURRENT METER READING IS Actual Read		SHOWS PAYMENTS RECEIVED BY July 28, 2015
NEXT SCHEDULED READING On or about Aug 21	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Jun 23	Jul 28	00851442	110795	110085	= 7100	x 1.071 =	7,601.97	8,707.18

Amount From Last Bill	9,580.28
Jul 22 Payment - Thank You	9,580.28-
Balance Forward	.00
This Period Gas Charge	8,707.18
Total Amount Due	$8,707.18

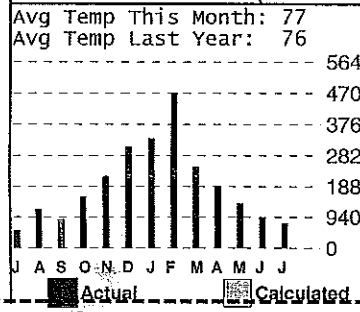
RECEIVED AUG - 3 2015

View the latest information about your account online, by visiting My Account atnjng.com
E-Bill is here. And, it's FREE. Sign up at My Account at njng.com then click "Register for E-Bill."

BILL CALCULATION

6,334.98 Therms X .3124 BGS	=	1,979.05
1,267.00 Therms X .3291 BGS	=	416.97
GSL Sales Demand Charge	=	3,028.52
7,601.97 Therms X .4255 D23	=	3,234.64
GSL Customer Charge	=	48.00
THIS SERVICE PERIOD GAS CHARGES		$8,707.18

USE COMPARISON (THERMS)



BUDGET OPTION $10,662.00

OTHER CHARGES

To join our Budget Plan, pay the Budget Option and any other charges. Your future bills would be for the budget amount and would include a summary of charges and payments. Budget term is 12 months, reviewed each year in July.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$.00	$8,707.18	August 12, 2015	$8,707.18

Make checks payable to NJNG.

Amount Paid $

0004310008801000100011100

00577191
00088 01 SP 0.485 001 088
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

194510004712 00376468000087071800000000000010662008

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE18 08/10

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at
www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$9,580.28
BILL TYPE Monthly 206M		DUE DATE July 11, 2015
CURRENT METER READING IS Actual Read		SHOWS PAYMENTS RECEIVED BY June 26, 2015
NEXT SCHEDULED READING On or about Jul 24	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS		100'S OF CUBIC FEET USED (CCF)		BTU CONTENT		BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
May 22	Jun 23	00851442	110085	109220	=	8650	x	1.067	=	9,231.28	9,580.28

Amount From Last Bill	31,094.94
May 29 Payment - Thank You	18,036.61-
Jun 25 Payment - Thank You	13,058.33-
Balance Forward	.00
This Period Gas Charge	9,580.28
Total Amount Due	$9,580.28

RECEIVED JUN 3 0 2015

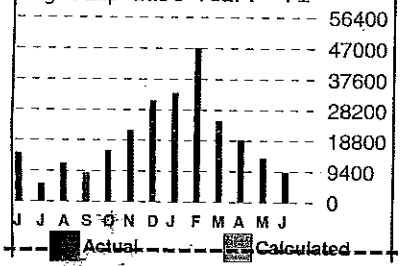
For quicker service in non-emergency matters, avoid calling us on Mondays or between 8 AM and 11 AM when we are busiest.
If you are planting or digging, call 811 or 1-800-272-1000 to request a free markout of utility lines.

BILL CALCULATION

7,385.02 Therms X .3291 BGS	=	2,430.41
1,846.26 Therms X .3234 BGS	=	597.08
GSL Sales Demand Charge	=	2,523.77
7,385.02 Therms X .4255 D23	=	3,142.33
1,846.26 Therms X .4586 D23	=	846.69
GSL Customer Charge	=	40.00
THIS SERVICE PERIOD GAS CHARGES		$9,580.28

USE COMPARISON (THERMS)

Avg Temp This Month: 73
Avg Temp Last Year: 71



BUDGET OPTION $10,662.00

OTHER CHARGES

To join our Budget Plan, pay the Budget Option and any other charges. Your future bills would be for the budget amount and would include a summary of charges and payments. Budget term is 12 months, reviewed each year in July.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$.00	$9,580.28	July 11, 2015	$9,580.28

Make checks payable to NJNG.

Amount Paid $

00577191
00088 01 SP 0.485 001 088
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

0004237 00088010001000111110

194510004712 00376468000095802800000000000010662003

New Jersey Natural Gas

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Wall, NJ 07719
www.njng.com

BILLTYPE19 09/10

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
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ACCOUNT NUMBER 19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	**TOTAL AMOUNT DUE** **$31,094.94**
BILL TYPE Monthly 206M		**DUE DATE** **June 12, 2015**
CURRENT METER READING IS Actual Read	9HBR	**SHOWS PAYMENTS RECEIVED BY** May 28, 2015
NEXT SCHEDULED READING On or about Jun 24	**SERVICE ADDRESS** HOOPER AV TR SHERIFF ST	**PLEASE READ REVERSE SIDE**

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Apr 22	May 22	00851442	109220	107969	= 12510	x 1.071	= 13,394.46	13,058.33

RECEIVED JUN - 3 2015

Amount From Last Bill	18,036.61
Past Due Amount	18,036.61
This Period Gas Charge	13,058.33
Total Amount Due	$31,094.94

REMINDER: The past due amount has not been received. Payment is due immediately

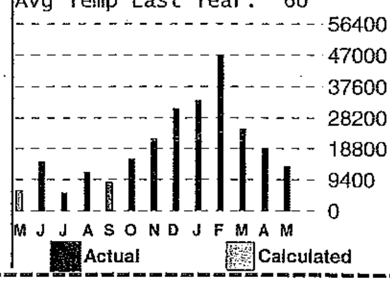
Want more conservation tips and offers? Sign up for our free E-Tips service by visiting My Account at njng.com
At New Jersey Natural Gas, SAFETY is our top priority. For more information, visit njng.com and click on My Safety.

BILL CALCULATION

9,376.12 Therms X .3234 BGS	=	3,032.24
4,018.34 Therms X .3284 BGS	=	1,319.62
GSL Sales Demand Charge	=	2,523.77
13,394.46 Therms X .4586D23	=	6,142.70
GSL Customer Charge	=	40.00
THIS SERVICE PERIOD GAS CHARGES		13,058.33

USE COMPARISON (THERMS)

Avg Temp This Month: 62
Avg Temp Last Year: 60



BUDGET OPTION

OTHER CHARGES

To join our Budget Plan, pay the Budget Option and any other charges. Your future bills would be for the budget amount and would include a summary of charges and payments. Budget term is 12 months, reviewed each year in July.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$18,036.61	$13,058.33	June 12, 2015	$31,094.94

Make checks payable to NJNG.

Amount Paid $ 13058.33

0004158 0043010001000011010

00577191
00043 01 SP 0.480 001 045
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
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NEWARK, NJ 07101-4743

194510004712 003764680003109494000180366100000000006

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
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www.njng.com

BILLTYPE18 09/10

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS 800 - GAS - LEAK
(800 - 427 - 5325)
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ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$18,036.61
BILL TYPE: Monthly 206M		DUE DATE: May 13, 2015
CURRENT METER READING IS: Actual Read	9HBR	SHOWS PAYMENTS RECEIVED BY: April 28, 2015
NEXT SCHEDULED READING: On or about May 26	SERVICE ADDRESS: HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS	100'S OF CUBIC FEET USED (CCF)	BTU CONTENT	BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Mar 24	Apr 22	00851442	107969	106188	= 17810	x 1.068	= 19,017.52	18,036.61

Amount From Last Bill	13,910.78
Apr 21 Payment - Thank You	13,910.78-
Balance Forward	.00
This Period Gas Charge	18,036.61
Total Amount Due	$18,036.61

RECEIVED MAY - 1 2015

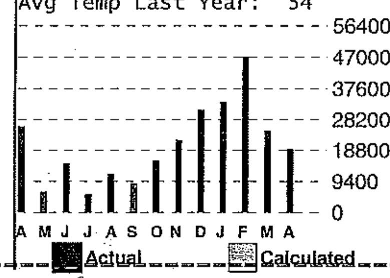
Save time, save money - pay online at njng.com
Remember to Follow us on Twitter and Like us on Facebook.

BILL CALCULATION

13,312.26 Therms X .3284BGS	=	4,371.75
5,705.26 Therms X .4171 BGS	=	2,379.66
GSL Sales Demand Charge	=	2,523.77
19,017.52 Therms X .4586D23	=	8,721.43
GSL Customer Charge	=	40.00
THIS SERVICE PERIOD GAS CHARGES		18,036.61

USE COMPARISON (THERMS)

Avg Temp This Month: 51
Avg Temp Last Year: 54



BUDGET OPTION $10,662.00

OTHER CHARGES

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Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$.00	$18,036.61	May 13, 2015	$18,036.61

Make checks payable to NJNG.

Amount Paid $ 18036.61

0004080 005101000100011100

00577191
00051 01 SP 0.480 001 054
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

194510004712 003764680001803661000000000000010662006

New Jersey Natural Gas

1415 Wyckoff Road
P.O. Box 1464
Wall, NJ 07719
www.njng.com

BILLTYPE19 08/15

CUSTOMER SERVICE 800 - 221 - 0051
REPORTING GAS LEAKS **800 - GAS - LEAK**
(800 - 427 - 5325)
Rate-related filings and public notices are available at www.njng.com/regulatory

ACCOUNT NUMBER		TOTAL AMOUNT DUE
19-4510-0047-12	OCEAN COUNTY JUSTICE COMPLEX C/O ENERGY COUNCIL PO BOX 2191 TOMS RIVER NJ 08754-2191	$16,154.99
BILL TYPE Monthly 206CNA2G		DUE DATE June 10, 2016
CURRENT METER READING IS Actual Read	9HBR	SHOWS PAYMENTS RECEIVED BY May 26, 2016
NEXT SCHEDULED READING On or about Jun 23	SERVICE ADDRESS HOOPER AV TR SHERIFF ST	PLEASE READ REVERSE SIDE

SERVICE PERIOD FROM	SERVICE PERIOD TO	METER NUMBER	METER READING PRESENT	METER READING PREVIOUS		100'S OF CUBIC FEET USED (CCF)		BTU CONTENT		BILLING UNITS USED (THERMS)	THIS SERVICE PERIOD GAS CHARGES
Apr 25	May 24	00851442	125297	- 124227	=	10700	x	1.066	=	11,406.20	7,333.84

Amount From Last Bill	18,604.28
May 11 Payment - Thank You	9,783.13-
Past Due Amount	8,821.15
This Period Gas Charge	7,333.84
Total Amount Due	$16,154.99

REMINDER: The past due amount has not been received. Payment is due immediately

RECEIVED JUN - 1 2016

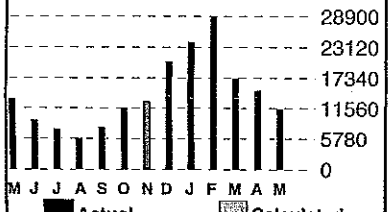
At New Jersey Natural Gas, SAFETY is our top priority. For more information, visit njng.com and click on My Safety.
E-Bill is here. And, it's FREE. Sign up at My Account at njng.com then click "Register for E-Bill."

BILL CALCULATION

GSL Transport Demand Charge	=	2,523.77
11,406.20 Therms X .4182DEL	=	4,770.07
GSL Trans Customer Chg	=	40.00
THIS SERVICE PERIOD GAS CHARGES		$7,333.84

USE COMPARISON (THERMS)

Avg Temp This Month: 57
Avg Temp Last Year: 62



BUDGET OPTION
OTHER CHARGES

To join our Budget Plan, pay the exact amount of both the Budget Option and Other Charges prior to the due date. Your future bills will reflect the amount listed for the Budget Option and any additional charges incurred during the billing period.

Please return this portion with your payment. For address changes or comments, please call numbers shown above.

ACCOUNT NUMBER	PREVIOUS BALANCE	CURRENT CHARGES	CURRENT CHARGES DUE	TOTAL BALANCE
19-4510-0047-12	$8,821.15	$7,333.84	June 10, 2016	$16,154.99

Make checks payable to NJNG.

Amount Paid $ 7333.84

00577191
00070 01 SP 0.465 001 071
OCEAN COUNTY JUSTICE COMPLEX
C/O ENERGY COUNCIL
PO BOX 2191
TOMS RIVER NJ 08754-2191

NJ NATURAL GAS CO.
P.O. BOX 11743
NEWARK, NJ 07101-4743

00050898000070010001000110010

194510004712 00376468000161549900008821150000000001

Appendix E

Heating and Cooling Load Calculations

Baseline Thermal Data

The OCJC complex currently employs natural gas boilers for space heating (incorporating winter heating and summer reheats) and domestic hot water (DHW) production which has a dedicated natural gas meter (A/C #19-4510-0047-12). Natural gas is supplied by New Jersey Natural Gas and is billed on a monthly basis. However, monthly billing data is subject to revision and may not always reflect actual usage at the facility for the given period. Figure 1 provides a chart of natural gas billing data and heating degree days concurrent with the billing periods. This chart also indicates the months where the billing information was estimated which occurs frequently. It is evident from Figure 1 that billing data related gas throughput is not necessarily reflective of actual site load.

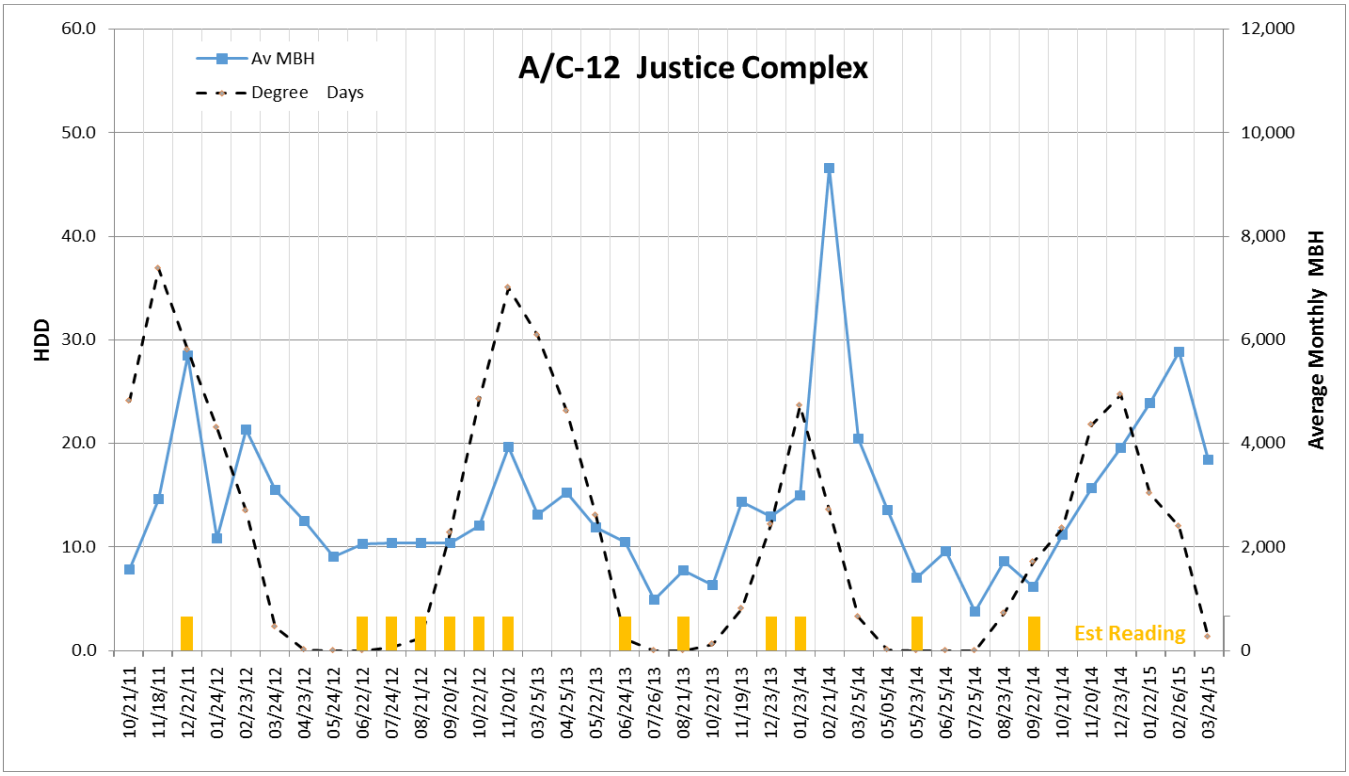


Figure 1 NG Utility Billing Data, Oct 2011 through Mar 2015

Facility boiler operations personnel maintain daily boiler logs which are required for emissions reporting purposes and are recordings for the boiler gas meters at the end of each day. These logs were tabulated, reviewed and compared to billing data for the same billing periods. Figure 2 provides a comparison of both sets of data and indicates that the boiler log readings appear to be more consistent with thermal energy use expectations at the site. While there are significant variations between utility billing data and daily boiler log data for a number of billing periods, the annual totals are in fact closely aligned.

The boiler log readings were also graphed against daily heating degree days as presented in Figure 3 which provides clear evidence that in fact the daily boiler readings are consistent with boiler load.

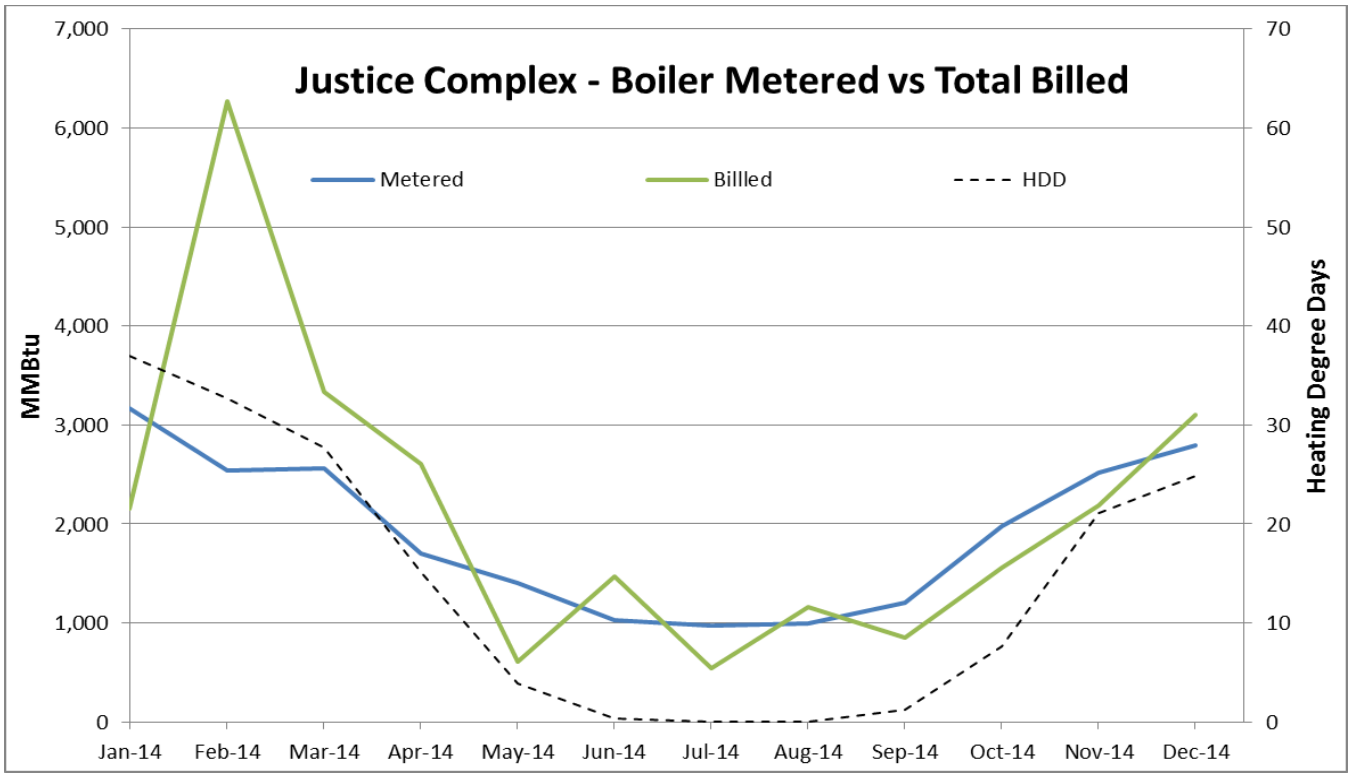


Figure 2 Comparison of Billing and Log Data for 2014

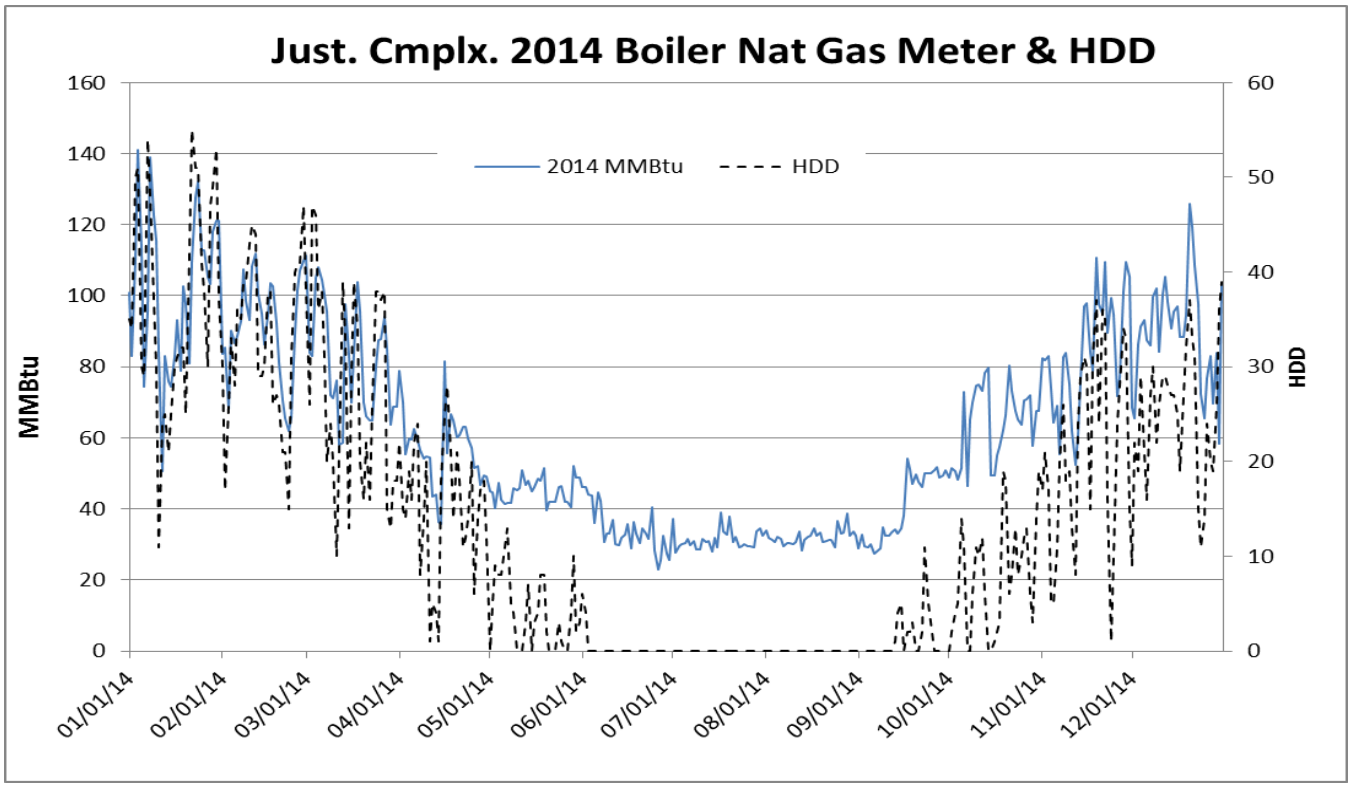


Figure 3 Daily Boiler Log Readings versus HDD

Based on the daily boiler log data for natural gas throughput, a boiler efficiency of 80% (verified with measurements) the following graph provides the estimated average hourly load for the complex during 2014 are graphed in Figure 4. These data indicate a peak heating load in winter consisting of space heating and DHW of approx. 4.75 MMBtu per hour and a summer load consisting of reheats and DHW production of approx. 1 MMBtu per hour.

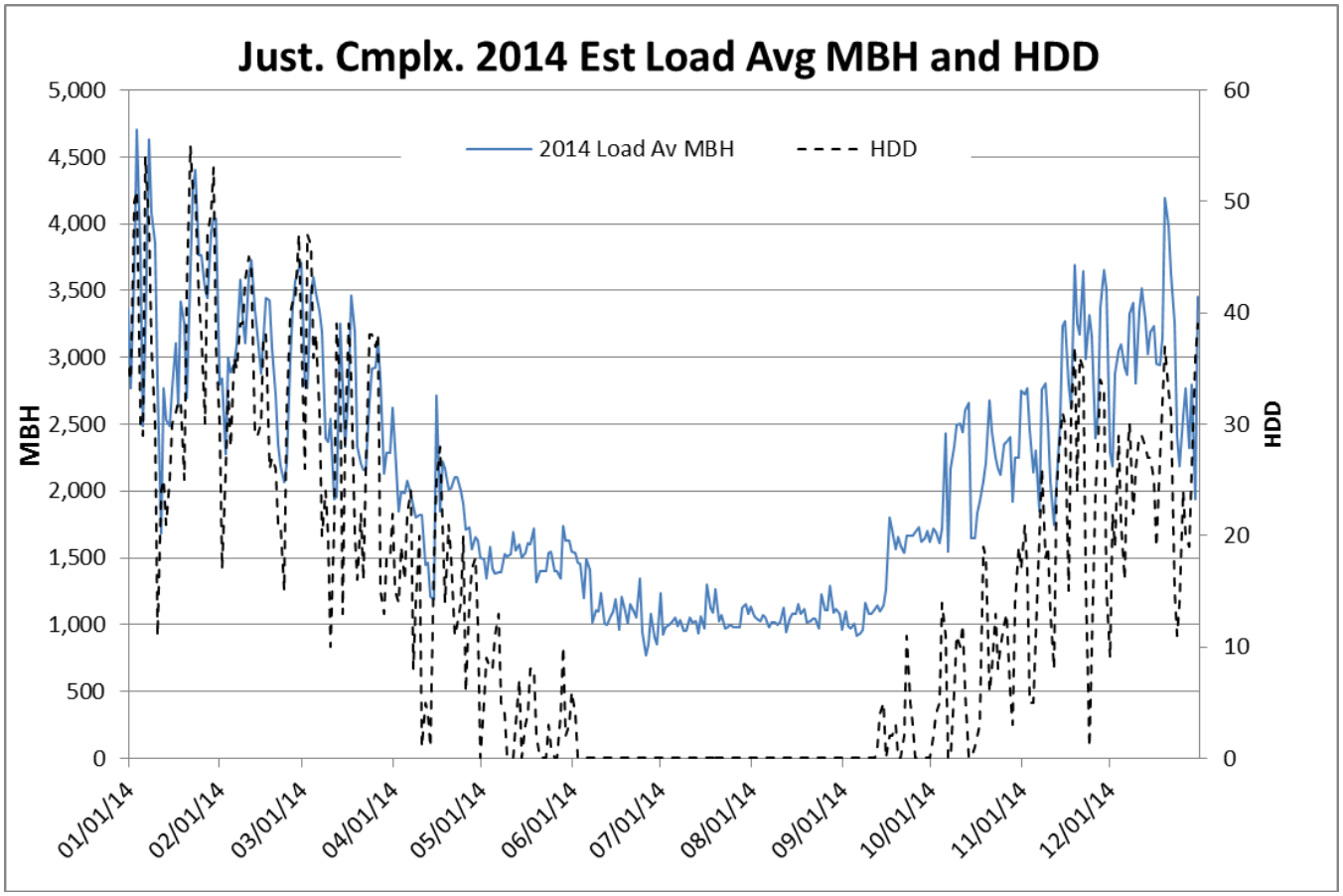


Figure 4 Daily Boiler Log Data in MBH

The chilled water loops also provide potential thermal load for a CHP plant when employing an absorption chiller to convert the CHP hot water to chilled water. An absorber may be used when there is insufficient hot water load to support the desired electric capacity. The Justice Complex facility contains a Carrier centrifugal electric chiller with a cooling capacity of 350 tons. This system was designed to provide cooling to more of the facility than is currently connected to the chilled water loop and is therefore nominally oversized. The New Jail incorporates multiple roof-top air handling units which include direct expansion cooling coils and therefore there is no cooling load at the New Jail that is addressable by a CHP based absorber that produces chilled water.

While there is no interval data available from the local utility (JCP&L), the total power use and average demand profile clearly for the Justice Complex (A.C # 100017910215) indicates an increase in demand during cooling season months. Figure 5 provides a graph of utility billing data for 2014 including peak demand, total utility use, average demand and load factor which is calculated as a comparison of peak versus average demand. This profile is consistent with a facility cooling system and demonstrates a peak demand differential between non-cooling and

cooling seasons of approx. 170 kW. Based on a chiller efficiency of 0.65 kW/ton and a distribution and cooling tower system demand of 0.2 kW/hr for a total chilled water system of 0.85 kW/ton, it is therefore estimated, that the available peak cooling load is a minimum of 200 tons. This is approximately 60% of the existing chiller's capacity and is consistent with site observations and discussions with facility personnel. Based on the distribution of cooling degree days (CDD) through the cooling season, Table 1 provides the estimated cooling load breakout.

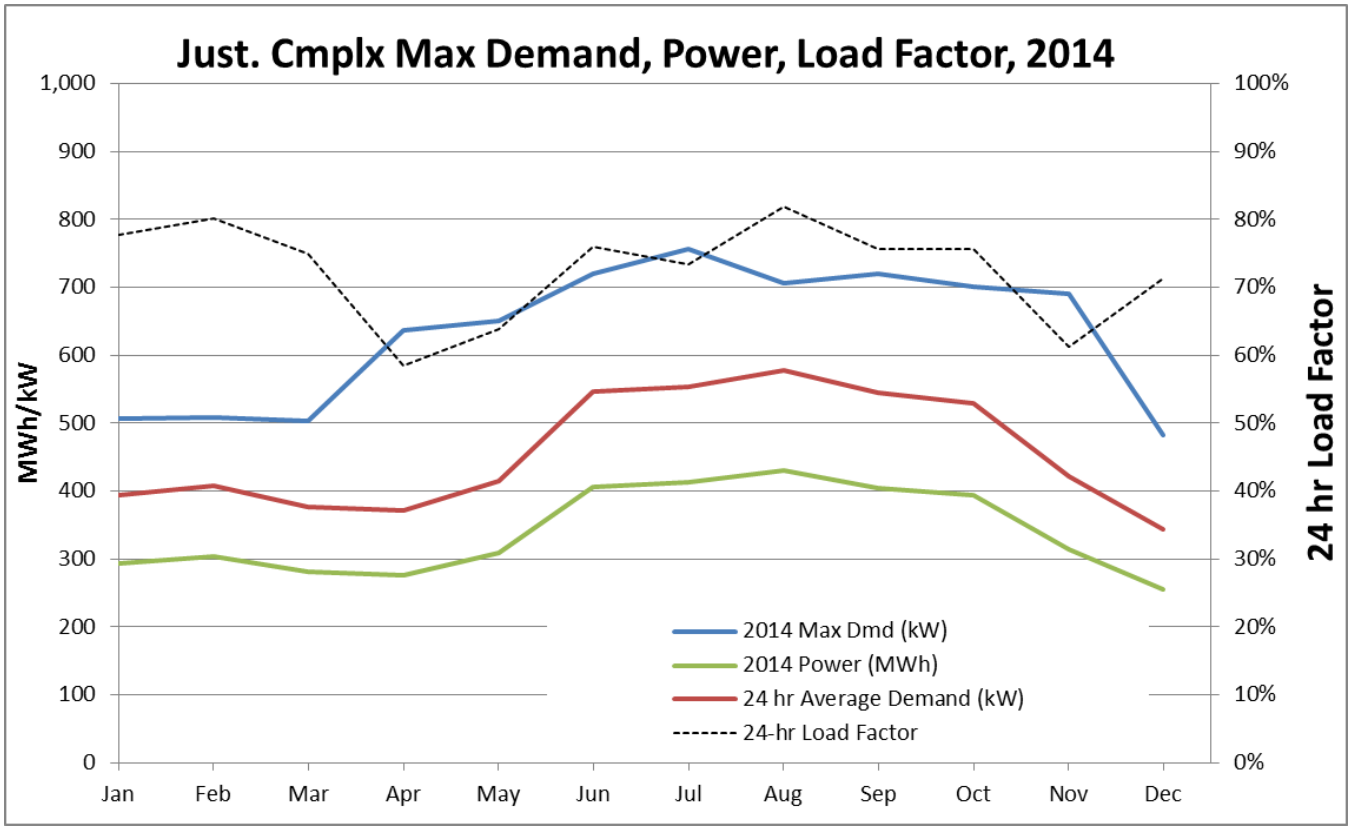


Figure 5 OCJC Electric Profile

		May	Jun	Jul	Aug	Sep
CDD @ 65 F	#	161	389	565	514	281
Peak Demand	Ton	57	138	200	182	100
Average Hourly Load	Ton	37	90	120	109	65
Min Hourly Load	Ton	24	58	72	65	42

Table 1 Cooling Load Calculation

Based on an analysis of the above data, visual inspection of equipment and discussions with facility operations personnel, the following assessment of the addressable thermal loads was made:

	Space Heating	DHW	Cooling
Peak Load	4,000 MBH	3,000 MBH	200 Tons
Average Load	1,600 MBH	750 MBH	84 Tons
Minimum Load	440 MBH	0 MBH	24 Tons

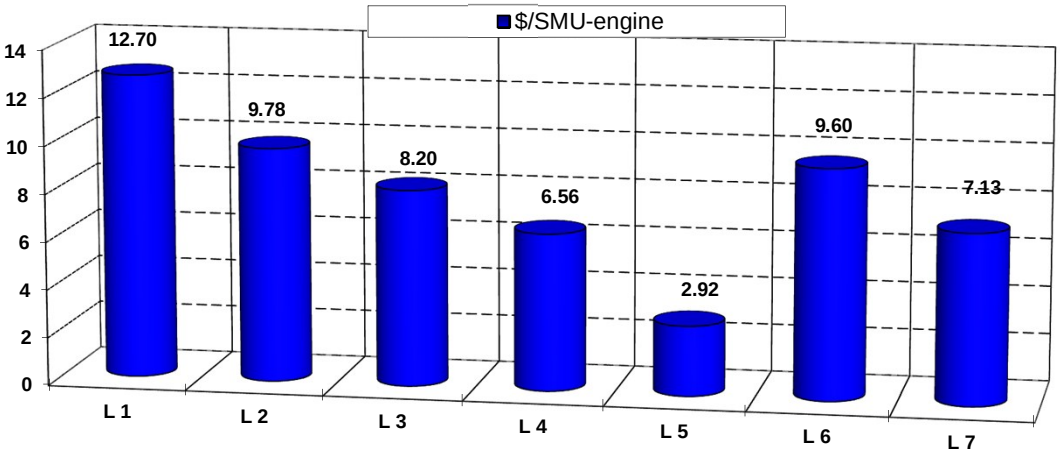
Appendix F

Warranty and/or Service Contract

TYPICAL MAINTENANCE CONTRACT OPTIONS FOR CHP SYSTEM

Graphic of cost determination

	Customer	CG132-12	Engine type
0	System	8,300	Running time per engine and year, SMU
HIGH	Gas type	0	Start of calculation, SMU
1	Number of engines	83,000	End of calculation, SMU
600 kW	El. power per engine	10.00	years



Service list	(L1 - L7)	L 1	L 2	L 3	L 4	L 5	L 6	L 7
Engine	3 x E 10	X	X	X	X		X	X
	21 x E 30	X	X	X	X		X	X
	15 x E 40	X	X	X	X		X	X
	3 x E 50	X	X	X	X		X	X
	1 x E 60	X		X	X	X	X	X
	1 x E 70	X		X	X	X		
	4 x TC 01	X	X	X	X		X	X
	1 x TC 02	X	X	X	X		X	X
Var. unscheduled spare parts per engine and year:		X	X					
unscheduled assignments (Labor)		X	X					
Exhaust Heat Exchanger inspection		X	X				X	
EGHE repairs		X	X				X	
Silencer inspection		X	X				X	
Silencer repairs		X	X				X	
Oxicat inspection		X	X				X	
Oxicat renewing		X	X				X	
Cooling water pump inspection		X	X				X	
Cooling water pump repairs		X	X				X	
Plate heat exchanger inspection		X	X				X	
Plate heat exchanger repairs		X	X				X	
Batteries inspection		X	X					
Batteries repairs		X	X					
Gas control line inspection		X	X				X	X
Gas control line repairs		X	X				X	X
TEM, Switching system inspection		X	X				X	X
TEM, Switching system repairs		X	X				X	X
Generator inspection		X	X				X	X
Generator repairs		X	X				X	X
Air starting equipment	Inspection							X
Air starting equipment	Repairs							X
Flex Coupling	Inspection	X	X				X	X
Flex Coupling	Repairs	X	X				X	X
Lube oil per engine		X	X		X		X	

All prices exclude legal VAT and are valid until: **2016-08-31**

Lube oil provided by customer (if oil change does not fall within maintenance interval, then oil change by customer).

TYPICAL MAINTENANCE CONTRACT FOR ABSORPTION CHILLER

TASK ACTION LIST

Model: CARRIER 16LJ ABSORBER Quantity: 1

Task and Options	Frequency: Year 1
START-UP & MAJOR OPERATING INSPECTION	1
REPORT TO CUSTOMER UPON ARRIVAL	x
CHECK CONTROLS, POWER & PIPING	x
CHECK VACUUM & LOG	x
CHECK VOLTAGE	x
CHECK & CALIBRATE ALL PRESSURE TRANSDUCERS	x
INSPECT STEAM CONTROL VALVE LINKAGE	x
CHECK WATER FLOWS	x
CHECK ALARM HISTORY	x
RUN CONTROLS TEST ON CHILLER	x
START CHILLER	x
LOG SOLUTION & REFRIGERANT PUMP AMERAGE	x
LOG EVAPORATOR REFRIGERANT TEMPERATURE	x
LOG ALL PUMP PRESSURES	x
LOG SOLUTION FILTER PRESSURE DROP	x
LOG ALL BROMIDE TEMPERATURES	x
LOG EVAPORATOR, ABSORBER & CONDENSER APPROACH	x
LOG ABSORBER LOSS	x
REMOVE NONCONDENSABLES	x
LOG CHILLED WATER TEMPERATURES IN & OUT	x
LOG CONDENSER WATER TEMPERATURES IN & OUT	x
LOG STEAM PRESSURES	x
INSPECT STEAM REDUCING STATION	x
CHECK PURGE OPERATION	x
LOG MOTOR TEMPERATURES	x
INSPECT CONTACTORS & RELAYS	x
LOG CHILLED WATER PRESSURE DROPS/FLOW	x
LOG CONDENSER WATER PRESSURE DROPS/FLOW	x
LOG MOTOR AMPERAGE	x
CHECK FOR PRESENCE OF HYDROGEN	x
CHECK SPECIFIC GRAVITY OF SOLUTION	x
CHECK FOR PRESENCE OF ALCOHOL	x
INSPECT MOTOR WIRING FOR CORROSION	x
MAKE CALIBRATIONS & ADJUSTMENTS IF NECESSARY	x
CHECK CHILLED WATER SETPOINT	x
CHECK OPERATION OF CHILLER	x
MAKE RECOMMENDATIONS	x
CHECK FOR VIBRATIONS & NOISES	x
INSPECT FOR EVIDENCE OF LEAKS	x
CLEAN UP WORK STATION	x
REPORT TO CUSTOMER ON DEPARTURE & ADVISE	x

	Frequency:
Task and Options	Year 1
ROUTINE OPERATING INSPECTION	4
REPORT TO CUSTOMER UPON ARRIVAL	x
CHECK CONTROLS, POWER & PIPING	x
CHECK VACUUM & LOG	x
CHECK VOLTAGE	x
CHECK & CALIBRATE ALL PRESSURE TRANSDUCERS	x
INSPECT STEAM CONTROL VALVE LINKAGE	x
CHECK WATER FLOWS	x
CHECK ALARM HISTORY	x
RUN CONTROLS TEST ON CHILLER	x
REMOVE SOLUTION ANALYSIS	x
PROVIDE A WRITTEN SOLUTION ANALYSIS REPORT	x
REPLACE SOLUTION FILTERS & GASKETS	x
LOG SOLUTION & REFRIGERANT PUMP AMERAGE	x
LOG EVAPORATOR REFRIGERANT TEMPERATURE	x
LOG ALL BROMIDE TEMPERATURES	x
LOG EVAPORATOR, ABSORBER & CONDENSER APPROACH	x
LOG ALL PUMP PRESSURES	x
LOG SOLUTION FILTER PRESSURE DROP	x
LOG ABSORBER LOSS	x
REMOVE NONCONDENSABLES	x
LOG CHILLED WATER TEMPERATURES IN & OUT	x
LOG CONDENSER WATER TEMPERATURES IN & OUT	x
LOG STEAM PRESSURES	x
INSPECT STEAM REDUCING STATION	x
CHECK PURGE OPERATION	x
LOG MOTOR TEMPERATURES	x
INSPECT CONTACTORS & RELAYS	x
LOG CHILLED WATER PRESSURE DROPS/FLOW	x
LOG CONDENSER WATER PRESSURE DROPS/FLOW	x
LOG MOTOR AMPERAGE	x
CHECK FOR PRESENCE OF HYDROGEN	x
CHECK SPECIFIC GRAVITY OF SOLUTION	x
CHECK FOR PRESENCE OF ALCOHOL	x
INSPECT MOTOR WIRING FOR CORROSION	x
MAKE CALIBRATIONS & ADJUSTMENTS IF NECESSARY	x
CHECK CHILLED WATER SETPOINT	x
CHECK OPERATION OF CHILLER	x
MAKE RECOMMENDATIONS	x
CHECK FOR VIBRATIONS & NOISES	x
INSPECT FOR EVIDENCE OF LEAKS	x
CLEAN UP WORK STATION	x
REPORT TO CUSTOMER ON DEPARTURE & ADVISE	x

	Frequency:
Task and Options	Year 1
ANNUAL MAINTENENCE	1
REPORT TO CUSTOMER UPON ARRIVAL	x
CHECK CONTROLS, POWER & PIPING	x
CHECK VACUUM & LOG	x
CHECK VOLTAGE	x
CHECK & CALIBRATE ALL PRESSURE TRANSDUCERS	x
INSPECT STEAM CONTROL VALVE LINKAGE	x
CHECK FOR WATER LEAKS	x
CHECK ALARM HISTORY	x
RUN CONTROLS TEST ON CHILLER	x
CLEAN FLOW SWITCH CONNECTIONS & CALIBRATE	x
REPLACE PURGE BOTTLE, HOSE & ADAPTOR	x
REPLACE SOLUTION FILTERS & GASKETS	x
LOG SOLUTION & REFRIGERANT PUMP AMERAGE	x
REMOVE NONCONDENSABLES	x
CHECK PURGE OPERATION	x
INSPECT MOTORS	x
INSPECT CONTACTORS & RELAYS	x
INSPECT STEAM CONTROL VALVE	x
CHECK FOR PRESENCE OF ALCOHOL	x
INSPECT MOTOR WIRING FOR CORROSION	x
MAKE CALIBRATIONS & ADJUSTMENTS IF NECESSARY	x
CHECK CHILLED WATER SETPOINT	x
CHECK OPERATION OF CHILLER	x
MAKE RECOMMENDATIONS	x
CHECK FOR VIBRATIONS & NOISES	x
INSPECT FOR EVIDENCE OF LEAKS	x
CLEAN UP WORK STATION	x
CLEAN CONDENSER TUBES	x
CLEAN ABSORBER TUBES	x
REPORT TO CUSTOMER ON DEPARTURE & ADVISE	x

Appendix G

Other relevant information

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
COUNTY OF OCEAN

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:
☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate
☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶
Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.
☑ Other (see instructions) ▶ **GOVERNMENT - COUNTY**

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any) **3**
Exemption from FATCA reporting code (if any)
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)
PO BOX 2191

Requester's name and address (optional)

6 City, state, and ZIP code
TOMS RIVER, NJ 08754-2191

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number
			–			–				

or

Employer identification number
2	1	–	6	0	0	0	9	5	4

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here Signature of U.S. person ▶ [signature] Date ▶ 01/06/2016

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5[2]
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor[2]
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee[1] The actual owner[1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity[4]
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

***Note.** Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

ENERGY SAVINGS PLAN

APPENDIX I

LGEA

LOCAL GOVERNMENT ENERGY AUDIT PROGRAM: ENERGY AUDIT REPORT

PREPARED FOR:

OCEAN COUNTY
101 HOOPER AVENUE
TOMS RIVER, NJ 08753
ATTN: JOSEPH MEYERS,
SUPERINTENDENT, BUILDINGS AND GROUNDS

PREPARED BY:

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REPORT ISSUANCE: **FINAL SEPTEMBER 11, 2014**

PROJECT NO: **1C14065**

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This report may contain proprietary, confidential or privileged information. If you have received this report in error, please notify the sender immediately. Thank you for your anticipated cooperation.

I. EXECUTIVE SUMMARY

This report presents the findings of the energy audit conducted for:

Entity: Ocean County

Facilities: Justice Complex
New Jail
Court House
Administration Building
P.E.E.R. Building – Parking Garage
Prosecutor's Building

County Contact Person: Carl W. Block, County Administrator
Facility Contact Person: Joseph Meyers, Superintendent, Building & Grounds

This audit is performed in connection with the New Jersey Clean Energy - Local Government Energy Audit Program for the County of Ocean. The purpose of this analysis is to provide the owner insight into the energy savings potential that exists within the facilities. Energy Efficiency changes and upgrades require support from the building occupants, operations personnel, and the administrators of the building in order to maximize the savings and overall benefit. The efficiency improvement of public buildings provides a benefit for the environment and the residents of New Jersey.

The Energy Conservation Measures (ECMs) identified within the reports represent the potential annual savings at each facility. It is recommended the owner consider all ECMs as part of an initiative to save energy, reduce emissions, and lower operating costs. The owner should review and be familiar with all measures presented in the reports prior to making a decision on which projects to move forward with.

Overall Assessment:

Overall the facilities assessed through this Energy Audit have the potential to generate substantial energy savings with the implementation of many of the recommendations outlined within each facility's report.

On the whole, Concord Engineering recommends the County review and be familiar with all measures presented in each facility report prior to making a decision on which projects to move forward with. This will enable the County to effectively align report recommendations with those outlined in their mid/long range facility plans and financial plans. The County should also review all conventional and unconventional funding options, along with all NJCEP funding opportunities for these projects and determine which options fit their budget most positively in the short and long term. The combination of this information will enable the County to put together an effective Energy Savings Improvement Strategy that maximizes the received benefits of the selected projects. The Installation and Funding Options Section further outlines what programs are potentially available to the owner for funding the project.

COMBINED POTENTIAL ENERGY EFFICIENCY PROJECT					
FACILITY ENERGY EFFICIENCY PROJECTS	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Justice Complex	$75,716	$859,954	$44,285	$815,669	10.8
New Jail	$104,437	$374,300	$10,072	$364,228	3.5
Court House	$44,978	$1,125,500	$59,143	$1,066,358	23.7
Administration Building	$48,835	$628,430	$50,968	$577,463	11.8
P.E.E.R. Building - Parking Garage	$128,223	$720,975	$59,628	$661,347	5.2
Prosecutor's Office	$17,817	$413,631	$28,766	$384,865	21.6
Total Entity Project	**$420,005**	**$4,122,790**	**$252,861**	**$3,869,929**	**9.2**

Total Entity Energy Costs:	**$1,922,815**
Est. Total Entity Energy Savings:	**$420,005**
Overall Percent Cost Reduction:	**21.8%**

Note: See individual facility reports for details regarding measures included in the above summary table.

Other Considerations:

Renewable Energy Conservation Measures:

Renewable Energy Measures (REMs) were also reviewed for implementation at the County Facilities. The County currently has some solar installed on the Prosecutor's Building, but still has a significant amount of available area on the Parking Garage, Court House, and Administration facilities that could accommodate solar. The total potential for these facilities results in an installed system capacity of 443 kW. The potential for wind generation was also reviewed for the County; however based on historical wind speed data, make it not a viable option.

Energy Procurement Recommendations:

The County is currently contracted with a third party supplier for electric and natural gas, Concord Engineering recommends they continue to purchase their electric and natural gas commodity through a third party supplier once the current contract has expired. Furthermore when entering into a new contract it is important the County aggregates all of their facilities into one contract for electric and natural gas supply in order to maximize commodity price savings. Further recommendations are outlined in the Energy Purchasing and Procurement Section.

Maintenance and Operational Recommendations:

In addition to the ECMs and REMs, there are maintenance and operational measures that can provide significant energy savings and provide immediate benefit, many of which the County are already performing. The ECMs listed above represent investments that can be made to the facility which are justified by the savings seen over time. However, the maintenance items and small operational improvements below are typically achievable with on-site staff or maintenance contractors and in turn have the potential to provide substantial operational savings compared to the costs associated. The following are recommendations which should be considered a priority in achieving an energy efficient building, further recommendations per building our provided in the building reports:

1. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.
2. Maintain all weather stripping on windows and doors.
3. Clean all light fixtures to maximize light output.
4. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.
5. Verify all control systems are utilizing setback and scheduling capabilities.
6. Replacement of older CRT style monitors with newer LCD/LED style monitors. Older CRT style monitors use up to four times more energy than LCD/LED monitor types.
7. The County should consider the installation of advanced power strips in classrooms that can be used to charge tablet and laptop computers in order to reduce the amount of idle power draw from these devices. (Smart Power Strips Model LPG3, Price ~$30)

8. Educate staff on awareness of wasteful energy practices such as leaving lights on unnecessarily, leaving on of non-essential computer and/or equipment at the end of the day, leaving of outside doors/windows open as a means to control room temperature, etc.

II. INTRODUCTION

The comprehensive energy audit covers the following buildings for Ocean County:

ENERGY AUDIT FACILITY SUMMARY		
FACILITY	**AREA (SQ-FT)**	**ADDRESS**
Justice Complex	163,600	120 Hooper Avenue Toms River, NJ
New Jail	168,000	118 Hooper Avenue Toms River, NJ
Court House	108,800	100 Hooper Avenue Toms River, NJ
Administration Building	45,500	101 Hooper Avenue Toms River, NJ
P.E.E.R. Building - Parking Garage	504,670	129 Hooper Avenue Toms River, NJ
Prosecutor's Office	32,205	119 Hooper Avenue Toms River, NJ

This audit is performed in connection with the New Jersey Clean Energy - Local Government Energy Audit Program. The energy audit is conducted to promote the mission of the office of Clean Energy, which is to use innovation and technology to solve energy and environmental problems in a way that improves the State's economy. This can be achieved through the wiser and more efficient use of energy.

Electrical and natural gas utility information is collected and analyzed for one full year's energy use of each building. The utility information allows for analysis of the building's operational characteristics; calculate energy benchmarks for comparison to industry averages, estimated savings potential, and baseline usage/cost to monitor the effectiveness of implemented measures. A computer spreadsheet is used to calculate benchmarks and to graph utility information (see the utility profiles below).

The Energy Use Index (EUI) is established for the building. Energy Use Index (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft^2/yr), which is used to compare energy consumption to similar building types or to track consumption from year to year in the same building. The EUI is calculated by converting the annual consumption of all energy sources to BTU's and dividing by the area (gross square footage) of the building. Blueprints (where available) are utilized to verify the gross area of the facility. The EUI is a good indicator of the relative potential for energy savings. A low EUI indicates less potential for energy savings, while a high EUI indicates poor building performance therefore a high potential for energy savings.

Existing building architectural and engineering drawings (where available) are utilized for additional background information. The building envelope, lighting systems, HVAC equipment, and controls information gathered from building drawings allow for a more accurate and detailed review of the building. The information is compared to the energy usage profiles developed from utility data. Through the review of the architectural and engineering drawings a building profile can be defined that documents building age, type, usage, major energy consuming equipment or systems, etc.

The preliminary audit information is gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is spent and opportunities exist within a facility. The entire site is surveyed to inventory the following to gain an understanding of how each facility operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Facility-specific equipment

The building site visit is performed to survey all major building components and systems. The site visit includes detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager are collected along with the system and components to determine a more accurate impact on energy consumption.

III. METHOD OF ANALYSIS

This audit is consistent with an ASHRAE level 2 audit. The cost and savings for each measure is ± 20%. The evaluations are based on engineering estimations and industry standard calculation methods. More detailed analyses would require engineering simulation models, hard equipment specifications, and contractor bid pricing.

Post site visit work includes evaluation of the information gathered, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on HVAC, lighting and building envelope improvements. Data collected is processed using energy engineering calculations to anticipate energy usage for each of the proposed energy conservation measures (ECMs). The actual building's energy usage is entered directly from the utility bills provided by the owner. The anticipated energy usage is compared to the historical data to determine energy savings for the proposed ECMs.

It is pertinent to note, that the savings noted in this report are not additive. The savings for each recommendation is calculated as standalone energy conservation measures. Implementation of more than one ECM may in some cases affect the savings of each ECM. The savings may in some cases be relatively higher if an individual ECM is implemented in lieu of multiple recommended ECMs. For example implementing reduced operating schedules for inefficient lighting will result in a greater relative savings. Implementing reduced operating schedules for newly installed efficient lighting will result in a lower relative savings, because there is less energy to be saved.

The project / Entity summary tables are based on the implementation of multiple measures. The analysis is reviewed and determined if the nature of the ECMs will cause a major conflict of the overall savings. When additive measures do not cause a major effect on the overall savings the ECMs are included. Where a major conflict is identified, the combined savings is evaluated appropriately to ensure the overall estimates are ± 20%.

ECMs are determined by identifying the building's unique properties and deciphering the most beneficial energy saving measures available that meet the specific needs of the facility. The building construction type, function, operational schedule, existing conditions, and foreseen future plans are critical in the evaluation and final recommendations. Energy savings are calculated base on industry standard methods and engineering estimations. Energy consumption is calculated based on manufacturer's cataloged information when new equipment is proposed.

Cost savings are calculated based on the actual historical energy costs for the facility. Installation costs include labor and equipment costs to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers. The NJ Smart Start Building® program incentives savings (where applicable) are included for the appropriate ECM's and subtracted from the installed cost. Maintenance savings are calculated where applicable and added to the energy savings for each ECM. The life-time for each ECM is estimated based on the typical life of the equipment being replaced or altered. The costs and savings are applied and a simple payback, simple lifetime savings, and simple return on investment are calculated. See below for calculation methods:

ECM Calculation Equations:

$$\text{Simple Payback} = \left(\frac{\text{Net Cost}}{\text{Yearly Savings}}\right)$$

$$\text{Simple Lifetime Savings} = (\text{Yearly Savings} \times \text{ECM Lifetime})$$

$$\text{Simple Lifetime Return on Investment (ROI)} = \frac{(\text{Simple Lifetime Savings} - \text{Net Cost})}{\text{Net Cost}}$$

$$\text{Lifetime Maintenance Savings} = (\text{Yearly Maintenance Savings} \times \text{ECM Lifetime})$$

$$\text{Net Present Value} = \sum_{n=0}^{N}\left(\frac{\text{Cash Flow of Period}_n}{(1+\text{DR})^n}\right)$$

$$\text{Internal Rate of Return (IRR)} \rightarrow \text{Net Present Value} = 0 = \sum_{n=0}^{N}(\frac{\text{Cash Flow of Period}_n}{(1+\text{IRR})^n}$$

Net Present Value calculations are based on Discount Rate (DR) of 3%.

IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage

The energy usage for the facilities is tabulated and plotted in graph form as depicted within each facility report (see the individual facility energy audit reports for details). Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner. The electric and natural gas utilities are shown below in Table 2 & 3 for all facilities:

Table 2
Electric Utility Summary

ELECTRIC UTILITY USAGE PER FACILITY			
FACILITY	**ANNUAL ELECTRIC UTILITY**		
DESCRIPTION	**USAGE (KWH)**	**COST ($)**	**AVE RATE ($/KWH)**
Justice Complex	4,283,491	$473,158	$0.110
New Jail	2,657,451	$309,308	$0.116
Court House	1,962,847	$272,414	$0.139
Administration Building	1,609,920	$213,809	$0.133
P.E.E.R. Building - Parking Garage	1,773,120	$205,028	$0.116
Prosecutor's Office	412,480	$51,598	$0.125
Total	**12,699,309**	**$1,525,314**	**$0.120**

Table 3
Natural Gas Summary

NATURAL GAS UTILTY USAGE PER FACILITY			
FACILITY	**ANNUAL NATURAL GAS UTILITY**		
DESCRIPTION	**USAGE (THERMS)**	**COST ($)**	**AVE RATE ($/THERM)**
Justice Complex	189,166	$198,796	$1.05
New Jail	46,746	$53,814	$1.15
Court House	32,583	$37,587	$1.15
Administration Building	34,852	$38,137	$1.09
P.E.E.R. Building - Parking Garage	48,888	$52,964	$1.08
Prosecutor's Office	12,942	$16,203	$1.25
Total	**365,177**	**$397,501**	**$1.09**

B. Energy Use Index (EUI)

Energy Use Index (EUI) is a measure of a building's annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (BTU) and dividing this number by the building square footage. EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types. The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. The ORNL website determines how a building's energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use.

The site and source EUI for this facility is calculated as follows:

$$\text{Building Site EUI} = \frac{(\text{Electric Usage in kBtu} + \text{O}il \text{ Usage in kBtu})}{\text{Building Square Footage}}$$

$$\text{Building Source EUI} = \frac{(\text{Electric Usage in kBtu X SS Ratio} + \text{O}il \text{ Usage in kBtu X SS Ratio})}{\text{Building Square Footage}}$$

Table 4
Energy Use Index Summary

ENERGY USE INDEX PER FACILITY					
FACILITY	**BUILDING AREA**	**ENERGY USE INDEX**		**NATIONAL PEER GROUP COMPARISON**	**PRIMARY FUNCTION**
DESCRIPTION	**(SF)**	**SITE (KBTU/SF/YR)**	**SOURCE (KBTU/SF/YR)**	**SOURCE (KBTU/SF/YR)**	**TYPE**
Justice Complex	163,600	205.0	401.9	169.9	Courthouse
New Jail	168,000	81.8	198.7	169.9	Prison/Incarceration
Court House	108,800	91.5	224.7	169.9	Courthouse
Administration Building	45,500	197.3	459.5	148.1	Office
P.E.E.R. Building - Parking Garage	504,670	21.7	47.8	148.1	Office
Prosecutor's Office	32,205	83.9	179.4	148.1	Office
Total	**1,022,775**	**113.5**	**252.0**		

See the Appendix C - Statement of Energy Performance for comparason to other facilities

The chart above depicts the Site and Source Energy for the facilities along with most similar building type National PEER Group Comparison Rating published by Department of Energy.

Note the comparison metric for the PEER / Parking Garage is difficult to correlate to due to the mixed use space on a single electric and gas meter. It may benefit the County to consider sub-metering the garage electric to get a better understanding of energy use intensity of the PEER Building.

C. EPA Energy Benchmarking System

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows tracking and assessment of energy consumption via the template forms located on the ENERGY STAR website (www.energystar.gov). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and emphasis is being placed on carbon reduction, greenhouse gas emissions and other environmental impacts.

Based on information gathered from the ENERGY STAR website, Government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. It is vital that local government municipalities assess facility energy usage, benchmark energy usage utilizing Portfolio Manager, set priorities and goals to lessen energy usage and move forward with priorities and goals.

In accordance with the Local Government Energy Audit Program, CEG has created an ENERGY STAR account for the municipality to access and monitoring the facility's yearly energy usage as it compares to facilities of similar type. The login page for the account can be accessed at the following web address; the username and password are also listed below:

https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.login

User Name: OceanCountyNJ
Password: Lgeaceg2014

Security Question #1: What city were you born in?
Security Answer #1: Toms River

Security Question #2: In what city does your nearest sibling live?
Security Answer #2: Toms River

Note: It is recommended the owner change the account password once the audit process is complete.

The utility bills and other information gathered during the energy audit process are entered into the Portfolio Manager. The following is a summary of the results for the facility:

Table 5
Energy Star Performance Summary

ENERGY STAR PERFORMANCE RATING PER FACILITY			
FACILITY	**ENERGY STAR PERFORMANCE RATING**		
DESCRIPTION	**SCORE**	**AVERAGE**	**POTENTIAL CERTIFICATIONS**
Justice Complex	N/A	50	No
New Jail	N/A	50	No
Court House	N/A	50	Yes
Administration Building	4	50	No
P.E.E.R. Building - Parking Garage	N/A	50	Yes
Prosecutor's Office	80	50	Yes

See the Appendix C - Statement of Energy Performance for comparative facilities
Score: "N/A" represents facility that could not receive a rating. See Energy Star website for details.

Refer to **Statement of Energy Performance Appendix** for the detailed energy summary for each facility.

V. RENEWABLE/DISTRIBUTED ENERGY MEASURES

Globally, renewable energy has become a priority affecting international and domestic energy policy. The State of New Jersey has taken a proactive approach, and has recently adopted in its Energy Master Plan a goal of 30% renewable energy by 2020. To help reach this goal New Jersey created the Office of Clean Energy under the direction of the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified renewable technologies. A renewable energy source can greatly reduce a building's operating expenses while producing clean environmentally friendly energy.

Solar Generation

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which are mounted on all south and southwestern facades of the building. Flat roof, as well as sloped areas can be utilized; flat areas will have the panels turned to an optimum solar absorbing angle. (A structural survey of the roof would be necessary before the installation of PV panels is considered). Parking lots can also be utilized for the installation of a solar array. A truss system can be installed that is high enough to park vehicles under the array and no parking lot area is lost.

The state of NJ has instituted a program in which one Solar Renewable Energy Certificate (SREC) is given to the Owner for every 1000 kWh of generation. SREC's can be sold anytime on the market at their current market value. The value of the credit varies upon the current need of the power companies. The average value per credit used in our financial calculations is $152 per MWH. This equates to $0.152 per kWh generated.

CEG has reviewed the existing roof, ground, and parking lot area potential of the facilities being audited for the purposes of determining a potential for a photovoltaic system. The facilities were evaluated for the most economical and feasible areas for the installation of solar arrays. It should be noted a structural analysis was not performed on the areas where roof systems were recommended. A depiction of the areas utilized at each facility is shown in **Renewable / Distributed Energy Measures Calculation Appendix**. The system sizes are shown below for each building where installation of a solar PV system is feasible. The total KWH production for all facilities combined is 533,067 kWh annually, reducing the overall utility bill for the County by approximately 4.2% percent. A detailed financial analysis can be found in the **Renewable / Distributed Energy Measures Calculation Appendix** within each facility report. This analysis illustrates the payback of the system over a 15 year period. The eventual degradation of the solar panels and the price of accumulated SREC's are factored into the payback.

Table 6
Renewable Energy Summary

POWER PRODUCTION SUMMARY - PHOTOVOLTAIC SYSTEM PER FACILITY			
FACILITY	**PRODUCTION SUMMARY**		
DESCRIPTION	**SYSTEM SIZE (KW_{DC})**	**ELECTRIC PRODUCTION (KWH)**	**% REDUCTION**
Justice Complex	-	-	-
New Jail	62.64	76,091	2.9%
Court House	23.52	28,571	1.5%
Administration Building	13.68	16,686	1.0%
P.E.E.R. Building - Parking Garage	342.96	411,719	23.2%
Prosecutor's Office	-	-	-
Total	**443**	**533,067**	4.2%

The proposed photovoltaic array layout is designed based on the specifications for the Sharp Model ND-240QCJ panel. This panel has a "DC" rated full load output of 240 watts, and has a total panel conversion efficiency of 14.4%. Although panels rated at higher wattages are available through Sharp and other various manufacturers, in general most manufacturers who produce commercially available solar panels produce a similar panel in the 200 to 250 watt range. This provides more manufacturer options to the public entity if they wish to pursue the proposed solar recommendation without losing significant system capacity.

The array system capacity was sized based on available roof space, ground area, or parking canopy style system area available at each existing facility. Estimated solar array generation is calculated based on the National Renewable Energy Laboratory PVWatts Version 1.0 Calculator. In order to calculate the array generation an appropriate location with solar data on file must be selected. In addition the system DC rated kilowatt (kW) capacity must be inputted, a DC to AC de-rate factor, panel tilt angle, and array azimuth angle. The DC to AC de-rate factor is based on the panel nameplate DC rating, inverter and transformer efficiencies (95%), mismatch factor (98%), diodes and connections (100%), dc and ac wiring(98%, 99%), soiling, (95%), system availability (95%), shading (if applicable), and age(new/100%). The overall DC to AC de-rate factor has been calculated at an overall rating of 81%. The PVWatts Calculator program then calculates estimated system generation based on average monthly solar irradiance and user provided inputs. The monthly energy generation and offset electric costs from the PVWatts calculator is shown in the **Renewable/Distributed Energy Measures Calculation Appendix**.

The proposed solar array for each facility is qualified by the New Jersey Board of Public Utilities Net Metering Guidelines as a Class I Renewable Energy Source. These guidelines allow onsite customer generation using renewable energy sources such as solar and wind with a capacity of 2 megawatts (MW) or less. This limits a customer system design capacity to being a net user and not a net generator of electricity on an annual basis. Although these guidelines state that if a customer does net generate (produce more electricity than they use), the customer will be credited those kilowatt-hours generated to be carried over for future usage on a month to month basis. Then, on an annual basis if the customer is a net generator the customer will then be compensated by the utility the average annual PJM Grid LMP price per kilowatt-hour for the over generation. Due to the aforementioned legislation, the customer is at limited risk if they generate more than they use at times throughout the year. With the inefficiency of today's energy storage systems, such as batteries, the added cost of storage systems is not warranted and was not considered in the proposed design.

Direct purchase involves the owner paying for 100% of the total project cost upfront in lieu of one of the methods noted in the Installation Funding Options section below. Calculations include a utility inflation rate as well as the degradation of the solar panels over time. The financial summary per facility is as follows:

Table 7
Renewable Financial Summary

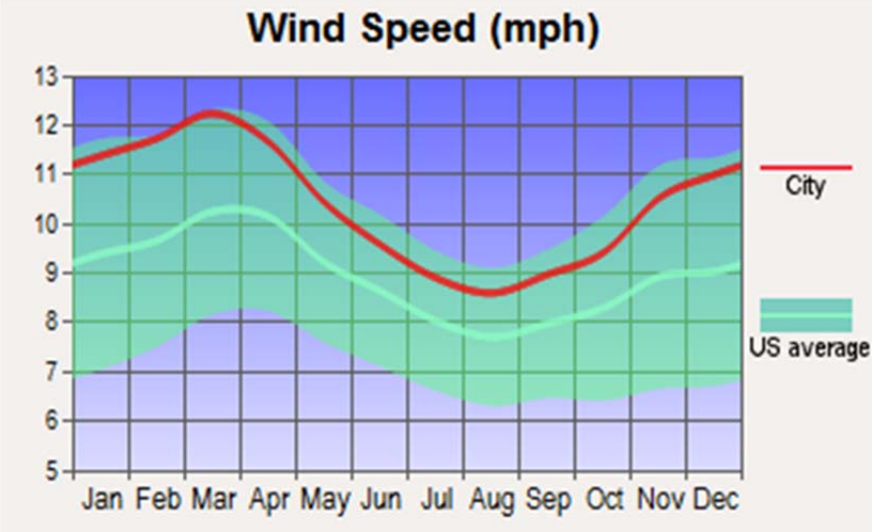
FINANCIAL SUMMARY - PHOTOVOLTAIC SYSTEM PER FACILITY			
FACILITY	**DIRECT PURCHASE FINANCIAL SUMMARY**		
DESCRIPTION	**INSTALATION COST ($)**	**TOTAL SAVINGS ($)**	**INTERNAL RATE OF RETURN**
Justice Complex	-	-	-
New Jail	$284,805	$20,659	1.1%
Court House	$111,342	$8,329	1.5%
Administration Building	$66,222	$4,747	0.9%
P.E.E.R. Building - Parking Garage	$1,631,135	$111,783	0.4%
Prosecutor's Office	-	-	-
Total	**$2,093,504**	**$145,518**	

Concord Engineering recommends the County review all options available for installation of solar PV systems at their facilities including a Power Purchase Agreement (PPA). This option utilizes providers who will own, operate, and maintain the system for a period of 15 years. During this time the PPA Provider would sell all of the electric generated by Solar Array to the County at a reduced rate compared to their existing electric rate. It should be noted that current SREC pricing has significantly impacted the PPA market for public entities in addition to the end of the 30% grant in lieu of the investment tax credit. These recent market changes have made it more difficult for public entities to secure low cost power purchase price options.

Wind Generation

In addition to evaluating solar, Concord also conducted a review of the applicability of wind energy for the County. Wind energy production is another option available through the Renewable Energy Incentive Program. Wind turbines of various types can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. Concord investigated the potential for smaller building mountable wind turbines, and horizontal turbines to maximize the available free space. In order to be economically viable a site requires a minimum average wind speed of 6 meters per second (13.5 mph). Based on the obtained wind data shown in **Figure 3** for Toms River the annual average wind speed is 10.4 mph with a peak of 12.25 mph, making this area unattractive for wind development. Therefore, wind energy is not a viable option to implement.

Figure 3: Monthly Wind Speed
(Toms River, New Jersey)



Combined Heat and Power

As part of the renewable and distributed energy technologies review, combined heat and power was investigated for implementation at the audited County facilities. Based on the load profiles for each building it was deemed the New Jail, Justice Complex, and Court House had the electrical and year round thermal load that would most benefit from a combined heat and power plant. The 300 kilowatt rated plant could generate over 18% of the electrical consumption at the facility, while satisfying approximately 86% of the thermal load. Further details regarding the economics of the plant can be found in the New Jail Facility Energy Report.

While the small scale CHP plant provides energy savings along with an economic benefit, the County should consider further investigation of its CHP potential and commission a more detailed study. The study would further develop the opportunity with more details costs, electrical interconnection and thermal loads to be connected to the plant. The further study of the coincident electric and thermal loads, including the potential for adding cooling, may warrant a larger plant with improved economies of scale, increased savings, reduced reliance on grid power, and environmental benefits. A larger plant would also make it more palatable for a third party own and operate scenario, where by the County would not need to secure funds to construct the plant. Rather they would be a customer of the plant purchasing thermal energy and electric at a contracted price over a designated term. By performing a more in depth CHP Feasibility study the County will be capable of fully vetting the opportunity at its facilities.

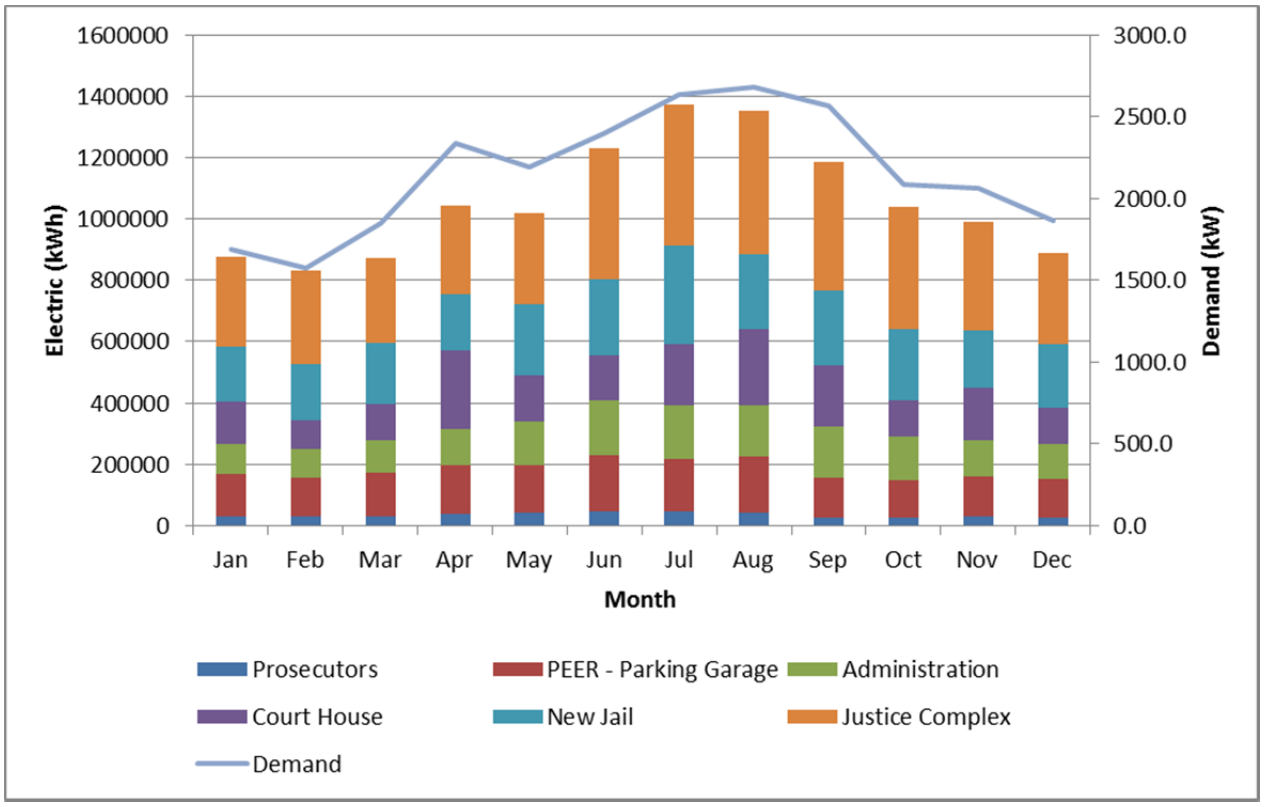
VI. ENERGY PURCHASING AND PROCUREMENT STRATEGY

Load Profile:

Load Profile analysis was performed to determine the seasonal energy usage of the facilities. Irregularities in the load profile will indicate potential problems within the facilities. Consequently based on the profile a recommendation will be made to remedy the irregularity in energy usage. For this report, the facilities energy consumption data was gathered in table format and plotted in graph form to create the load profile. Refer to The Electric and Natural Gas Usage Profiles included within this report to reference the respective electricity and natural gas usage load profiles.

Electricity:

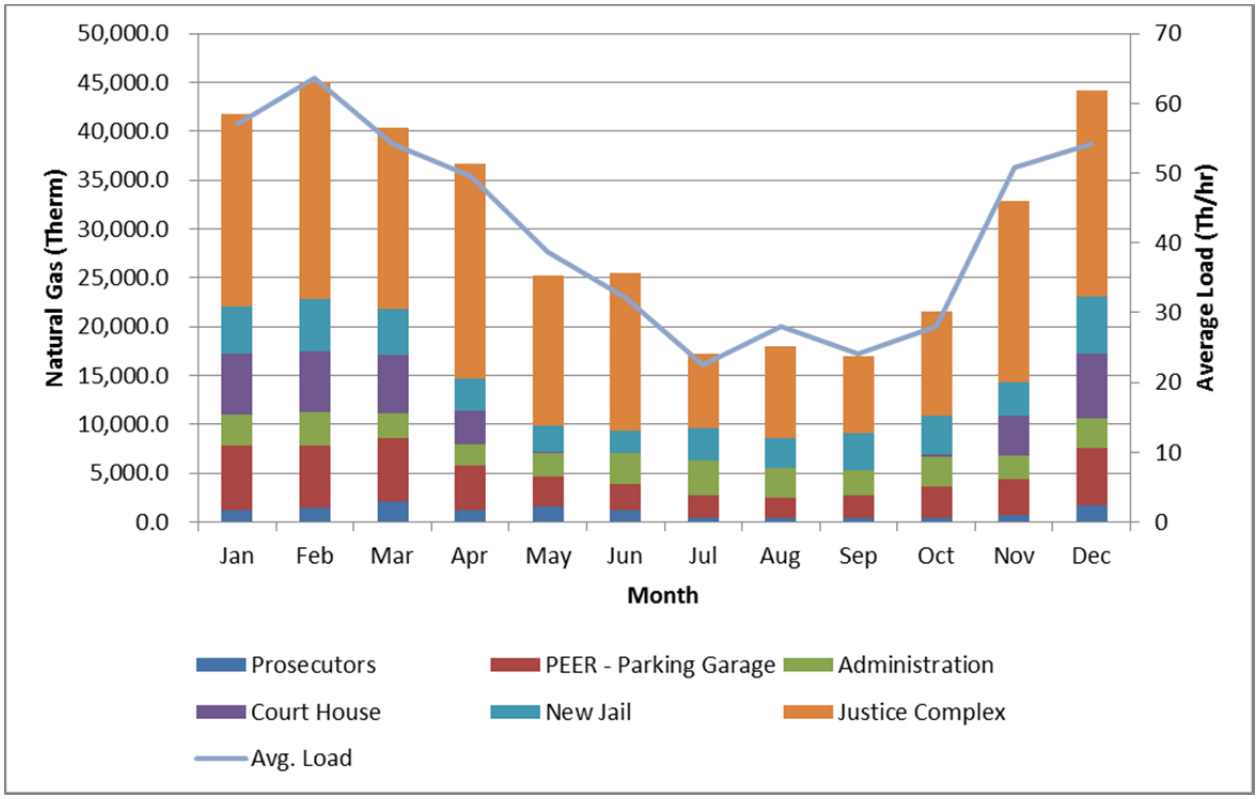
The electricity usage profile for the facilities represents a summer (or cooling) dominated load profile with peak demand and consumption occurring during the summer months. The figure below depicts the consumption and total demand pattern for electricity of the county facilities.



The historical usage profile is less than favorable as typically winter commodity rates are lower due to reduced demand on the grid, compared with summer. Third Party Supplier (TPS) electric commodity contracts that offer a firm, fixed price for 100% of the facilities electric requirements and are lower than the BGS-FP default rate are recommended.

Natural Gas:

The Natural Gas Usage Profile demonstrates a heating load dominated profile, with minimal consumption being contributed by domestic hot water and other gas consumers. The figure below depicts the consumption and total average load pattern for natural gas of the county facilities.



This load profile will yield less than favorable natural gas prices due to the heating dominated profile. Higher winter month consumption will yield higher pricing which will not be offset by the summer month consumption. Nymex commodity pricing is generally higher in the winter months of November – March and lower in the summer months of April – October.

Third Party Supplier (TPS) natural gas commodity contracts that offer a product structure to include a Fixed percentage savings product structure for 100% of the facilities **metered** natural gas requirements is recommended. Several natural gas third party suppliers are offering this product service for end users for a guaranteed savings strategy.

Tariff Analysis:

Electricity:

All the facilities receive electrical service from Jersey Central Power & Light (JCP&L) under commercial rate classifications General Service Primary and Secondary. All facilities have contracted a Third Party Supplier (TPS) to provide electric commodity service. Hess has been contracted however; the contract particulars such as product structure, price, term and conditions were not available for review or comments. For electric supply (generation) service, the client has a choice to either use JCP&L's default service rate BGS or contract with a Third Party Supplier (TPS) to supply electricity.

ELECTRIC UTILITY & 3RD PARTY PROVIDERS			
FACILITY	**UTILITY**		**THIRD PARTY**
DESCRIPTION	**PROVIDER**	**RATE CLASS**	**PROVIDER**
Justice Complex	JCP&L	GSP	Hess
New Jail	JCP&L	GSS	Hess
Court House	JCP&L	GSP	Hess
Administration Building	JCP&L	GSS	Hess
P.E.E.R. Building - Parking Garage	JCP&L	GSS	Hess
Prosecutor's Office	JCP&L	GSS	Hess

Each year since 2002, the four New Jersey Electric Distribution Companies (EDCs) - Public Service Gas & Electric Company (PSE&G), Atlantic City Electric Company (ACE), Jersey Central Power & Light Company (JCP&L), and Rockland Electric Company (RECO) - have procured several billion dollars of electric supply to serve their Basic Generation Service (BGS) customers through a statewide auction process held in February.

BGS refers to the service of customers who are not served by a third party supplier or competitive retailer. This service is sometimes known as Standard Offer Service, Default Service, or Provider of Last Resort Service.

The Auction Process has consisted of two auctions that are held concurrently, one for larger customers on an hourly price plan (BGS-CIEP) and one for smaller commercial and residential

customers on a fixed-price plan (BGS-FP). This facility's rate structure is based on the fixed-price plan (BGS-FP).

The utility will continue to be responsible for maintaining the existing network of wires, pipes and poles that make up the delivery system, which will serve all consumers, regardless of whom they choose to purchase their electricity or natural gas from. JCP&L's delivery service rate includes the following charges: Customer Service Charge, Distribution Charge (kWh and Demand), Societal Benefits Charge (SBC), and Securitization Transition Charge.

Natural Gas:

The facilities currently receive natural gas distribution service from New jersey natural Gas (NJNG) under rate schedules General Service Large (GSL). The facilities have contracted with a Third Party Supplier (TPS), Hess, to provide natural gas commodity service. The current TPS's provider information was not available and contract particulars such as product structure, price, term and conditions were not available for review or comments. For natural gas supply service, the client has a choice to either use NJNG's default service rate BGSS or contract with a Third Party Supplier (TPS) to supply natural gas commodity service.

NATURAL GAS UTILITY & 3RD PARTY PROVIDERS			
FACILITY	**UTILITY**		**THIRD PARTY**
DESCRIPTION	**PROVIDER**	**RATE CLASS**	**PROVIDER**
Justice Complex	NJNG	GSL	Hess
New Jail	NJNG	GSL	Hess
Court House	NJNG	GSL	Hess
Administration Building	NJNG	GSL	Hess
P.E.E.R. Building - Parking Garage	NJNG	GSL	Hess
Prosecutor's Office	NJNG	GSL	Hess

NJNG provides basic gas supply service (BGSS) to customers who choose not to shop from a Third Party Supplier (TPS) for natural gas commodity. The option is essential to protect the reliability of service to consumers as well as protecting consumers if a third party supplier defaults or fails to provide commodity service.

The utilities are responsible for maintaining the existing network of wires, pipes and poles that make up the delivery system, which will serve all consumers, regardless of whom they choose to purchase their electricity or natural gas from. NJNG's delivery service rate includes the following charges: Customer Service Charge, Distribution Charge, & Societal Benefits Charge (SBC).

Electric and Natural Gas Commodities Market Overview:

Winter 2014 proved to be one for the record books. Across the United States, temperatures plunged and states that rarely see snow have been paralyzed by icy conditions. The energy market was not spared. Market rates have been fluctuating wildly, reaching as much as $1,765 per MWh ($1.765/kWh) in PJM-West Hub when winter storms swept much of the northern half of the nation in January.

In our region, electricity is produced by natural gas, nuclear, coal and renewables. Much of the recent electricity increases are in relation to very high spot natural gas pricing on generation that produces electricity and the retirement of coal plants. Currently in PJM (PJM is the independent operating system that provides power to Pennsylvania, DC, New Jersey, Delaware and Maryland states) the severe cold in January 2014 led to the temporary lift of the $1000/mWh cap on electric market based pricing. This cap is lifted thru March 31, 2014. Many natural gas generators were not hedged on natural gas and the natural gas spot market on January 24th reached over $124.00/dth or $12.40/therm. Unfortunately, these costs are now being passed on to clients who were not in a fixed price contract.

Commodity pricing in 2008 and winter of 2014 marked historical highs in both natural gas and electricity commodity. Commodity pricing commencing spring of 2014 although higher than previous years continues to be favorable for locking in long term (2-5 year) contracts with 3rd Party Supplier's for both natural gas and electricity supply requirements.

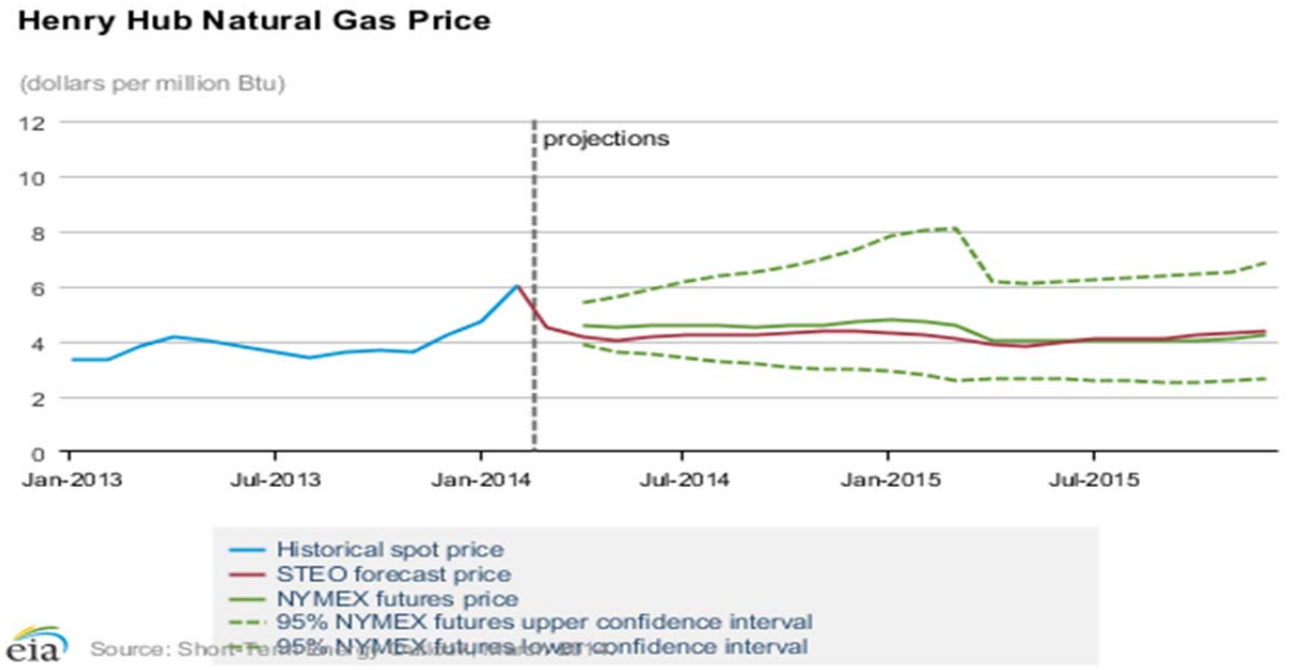
It is important to note that both natural gas and electric commodity market prices are moved by supply and demand, political conditions, market technicals and trader sentiment. The market is continuously changing Energy commodity pricing is also correlated to weather forecasts. Because weather forecasts are dependable only in the short-term, prolonged temperature extremes can really cause extreme price swings.

Short Term Energy Outlook - US Energy Information Administration (March/April 2014):

U.S. Natural Gas Prices. Natural gas spot prices averaged $6.00/MMBtu at the Henry Hub in February, up $1.29/MMBtu from January, the result of bitterly cold weather during the month. At the end of February, both spot and futures prices declined rapidly, falling below $5/MMBtu. EIA projects that the March spot price will average $4.48/MMBtu, and will continue to decline in the spring. Projected Henry Hub natural gas prices average $4.44/MMBtu in 2014 and $4.14/MMBtu in 2015.

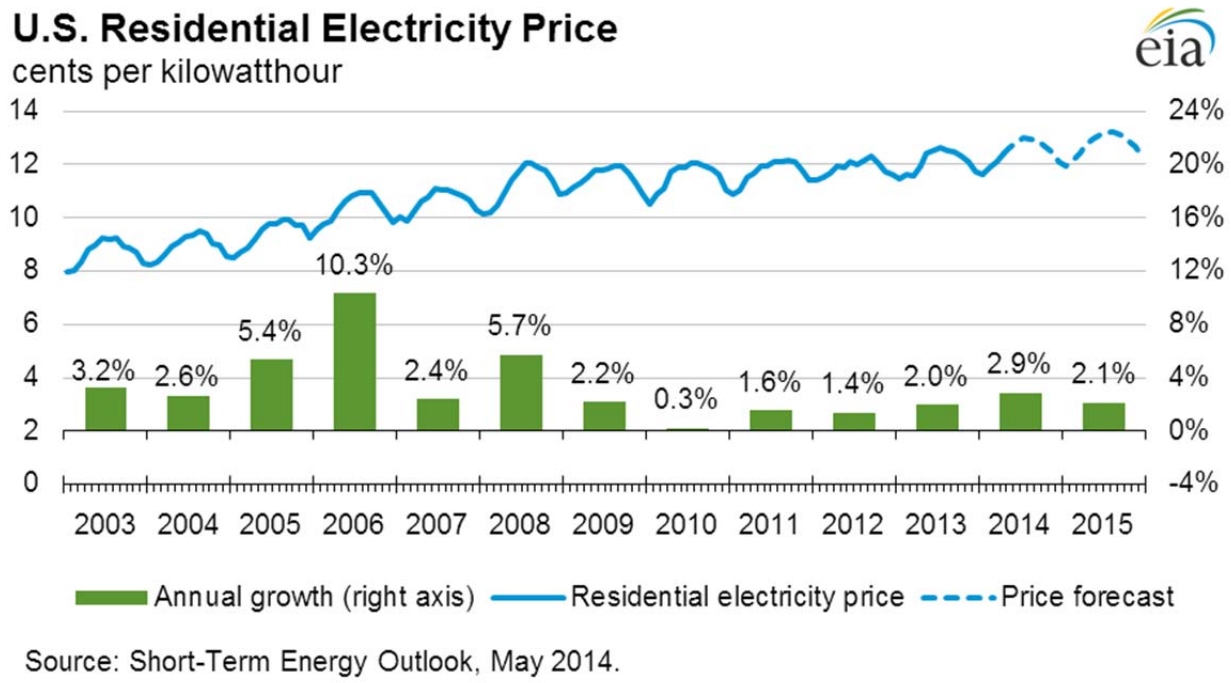
Natural gas futures prices for June 2014 delivery (for the five-day period ending March 6, 2014) averaged $4.55/MMBtu. Current options and futures prices imply that market participants place

the lower and upper bounds for the 95% confidence interval for June 2014 contracts at $3.51/MMBtu and $5.90/MMBtu, respectively. At this time last year, the natural gas futures contract for June 2013 averaged $3.61/MMBtu and the corresponding lower and upper limits of the 95% confidence interval were $2.79/MMBtu and $4.67/MMBtu.



Note: Confidence interval derived from options market information for the 5 trading days ending Mar. 6, 2014. Intervals n

U.S. Electricity Retail Prices. EIA expects the U.S. residential price of electricity to average 12.3 cents per kilowatthour during 2014, an increase of 1.9% from 2013. Residential electricity prices increase 2.0% during 2015.



Source: Short-Term Energy Outlook, May 2014.

Contracting with Third Party Suppliers and BGS Bidding Options

Cooperative Purchasing:

Cooperative Purchasing agreements allow multiple parties to come together under the premise of using purchasing power in order to reduce the price for goods and services. In this instance the Cooperative is under the unified goal of reducing energy prices for its members. As such members of the cooperative pool their respective energy consumption together into a single bid to obtain low cost energy pricing.

Many Cooperatives have a formal bidding process and insure all suppliers provide the required documentation and paperwork necessary per New Jersey Administrative Code and Procurement Law. In addition, a Master Agreement is incorporated into the bid specifications with terms and conditions for the energy supply award protecting Local Government Entities. Concord does not recommend signing any Third Party Supplier contract or agreement unless it has been heavily vetted by an attorney that understands commodity law and regulation. Many government clients that have signed third party supplier contracts are now experiencing regulatory pass-thru charges due to vague or inadvertently agreed terms and conditions.

Important information can be found on DCA's website regarding Cooperative Purchasing. Please visit web link:
http://www.state.nj.us/dca/divisions/dlgs/programs/lpcl_docs/Procuring_Power_Supply_through_a_Cooperative_Purchasing_System.pdf
It is important with any commodity procurement undertaking that you incorporate a rational, defensible strategy for purchasing commodity in volatile markets based upon the following:

- Budgets that reflect sound market intelligence

- An understanding of historical prices and trends
- Awareness of seasonal opportunities (e.g. shoulder months)
- Negotiation of fair contractual terms
- An aggressive, market based price

Bidding Practices and Processes:

Different bid processes and methodologies can create different objectives, but transparency is always a primary goal. Closed bid competitive purchase RFBs, online bid receipt or online reverse auctions can be utilized. Firms which can provide online bidding and reverse auctions are approved by the New Jersey Division of Local Government Services pursuant to the Local Unit Electronic Technology Program, (P.L.2001, c. 30). Approved firms can be found on the website at: http://www.state.nj.us/dca/divisions/dlgs/programs/lpcl.html

Over the last decade, Concord has been involved with numerous approaches to bidding including the Traditional Sealed Bid format and Online Reverse Auction methods. In our experience, Online Reverse Auctions do not always produce optimum results for retail commodity purchases. The procurement consultant with the Client should determine a bidding practice that will yield optimum results and create a robust competitive environment. Many factors will come into consideration to determine whether the Online Bidding and/or Reverse Auction method is appropriate. Factors such as annual consumption, number and complexity of accounts, potential supplier participation as well as rate tariffs must be taken into consideration.

LGE's Purchasing Options:

Per DCA's paper entitled "Taking Advantage of Lower Electric Rates for your Government Agency" they state, "First, it is important to emphasize that procurement of power supply *must* be consistent with the Local Public Contracts Law (LPCL) or for boards of education, the Public School Contracts Law (PSCL). Bottom line: When the estimated amount of spending for *power supply* is above the contracting unit's bid threshold, power supply must be publicly bid or purchased subject to an exception to the bid law. "Full text can be found via web link: http://www.state.nj.us/dca/divisions/dlgs/programs/lpcl_docs/Taking_Advantage_of_Lower_Electric_Rates_for_your_Government_Agency.pdf

1. Cooperative Purchasing

   "When local governments put aside provincial interests in exchange for the broader benefits to be achieved through Cooperative Purchasing, they can secure the provision and performance of goods and services at a lower cost. Cooperative Purchasing has demonstrated a strong ability to serve as an effective tool to assist local officials save taxpayer dollars. Cooperative Purchasing represents viable alternatives to the conventional "go-it-alone" bidding process. " Many Cooperatives in the state utilize online bidding to secure attractive electricity and natural gas supply service. Utilizing a Cooperative is highly recommended.

   Benefits can include:
   - Increase staff effectiveness

- Reduce duplication of bidding and contract processing
- Reduce time, effort and costs associated with developing and managing the bid process
- Leverage established and large volume pricing of contracted products
- Great alternative contract option to save time, money and ensure quality products & services

2. Online Reverse Auctions and Online Sealed Bids

"For local government entities, the requirement to bid does not mean the solicitation of quotes; it means a formal process where there is a bid specification, notice to bidders, and a level playing field for all potential bidders. The Division's E-Procurement Pilot program (authorized under P.L. 2001, c. 30) allows local units to purchase commodities and services, including energy supply, through online bidding and reverse auctions programs approved by the Division. Any online organization participating in the online pilot program must be approved by the Division. Once the Division has approved an online service, any local unit can take advantage of the service. When conducted through an online service, however, the local unit is responsible to ensure that the online service is operating consistent with procurement laws for an individual procurement."

Both online reverse auctions and online sealed bids can produce significant cost savings results. The process is transparent and seamless. Many platforms are very flexible allowing for full customization to meet the Client's needs.

All providers of online reverse auction and online bidding charge a fee indirectly to LGE's. The fee is included in the bid pricing shown by suppliers as a $/kWh or $/therm charge and paid directly by the supplier to the vendor. Although LGE's do not have to formally bid for this type of service should they utilize a DCA pre-approved vendor, we would recommend that any and all fees paid by the supplier to the vendor be disclosed prior to any engagement of services.

An overview of both the Online Reverse Auction vs Sealed bid format was published in the NJBIZ Spring of 2007. To view this article, please go to web link:
http://www.nbizmag.com/magarticles/sealedbidvsreverseauction.pdf

Benefits can include:

- Provides full transparency during the procurement process with unbiased decision making
- Drives prices down through real-time competition
- Allows client to actively participate during the entire auction or online bidding process
- Execution of contracts are completed within hours of the auction's close
- Places the focus for suppliers solely on price, since all other factors and related contracting documentation is received and pre-qualified before the final auction bid due date

- Full audit and archival capabilities to substantiate award decisions
- Improves knowledge capture, transfer and re-use capabilities

3. Traditional Sealed Bid Format

   This type of bid format is not endorsed by the Division of Local Government Services for the bidding of power supply. However, in a recent review of bidding methodologies and which methodology would likely to produce lower cost results, a NJ Government Agency allowed suppliers to choose the bidding format. The bidding options allowed were either via an Online Reverse Auction or via a Traditional Sealed Bid. The Agency understood that many suppliers will not participate in an online auction format or methodology and wanted to allow all NJBPU suppliers to participate. The Agency is the 2nd largest Cooperative in the state which includes participants from five Counties and over 200 municipalities. After the online reverse auction bid was closed and the traditional sealed bids opened and reviewed, the Agency awarded the electricity contract to a bidder that was the lowest price and submitted their bid via the Traditional Sealed Bid Format.

The below recommendations presented by Concord Engineering are based on current information provided by the County for their facilities historical energy usage. Any savings presented with these recommendations are estimates only based on that information. It is recommended that further analysis and review of more recent utility data and actual TPS electricity and natural gas supply contracts and historical billings be performed prior to performing any of the presented recommendations.

Recommendations:

1. Concord recommends the County continue its aggregation approach for 3rd party commodity supply procurement strategies for the purchase of electricity and natural gas. Aggregating the usage of all facilities for both electricity and natural gas supply service, allows the County to continue to achieve lower prices in commodity supply costs over the utility default service programs. Energy commodities are among the most volatile of all commodities, however at this point and time, energy is extremely competitive and contract terms longer than 12 months are desirable. Contracts due to expire in the near term would continue to yield very favorable pricing. It is important to aggregate usage where available and take advantage of these current market prices quickly, before energy increases.

2. After review of the utility consumption report and current commodity pricing outlook, Concord recommends that the County utilize the advisement of a 3rd party unbiased Energy Consulting Firm licensed by the State of New Jersey Board of Public Utilities that is experienced in the procurement of commodities, New Jersey procurement laws, aggregation of facilities and energy supply risk and commodity management. This firm should be able to provide full service advisement over the term of the contract, provide market watch opportunities and identify any additional opportunities that may further

reduce costs. Many of these opportunities may include: energy rates; utility bill auditing; energy data analytics; and efficiency improvements.

It is important that a rational, defensible strategy for purchasing commodity in volatile markets is incorporated. Examples include:

- Budgets that reflect sound market intelligence
- An understanding of utility and market historical prices and trends
- Awareness of seasonal opportunities (e.g. shoulder months)
- Negotiation of fair contractual terms
- An aggressive, market based price

3. Concord also recommends that the County consider utilizing a third party utility billing-auditing service to further analyze historical utility invoices such as water, sewer, natural gas, electricity and solar for incorrect billings and rate tariff optimization services. This service can be based on a shared savings model with no direct cost. The service could provide refunds on potential incorrect billings that may have been passed through by the utilities and paid by the County.

VII. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the facility owner to utilize in subsidizing the costs for installing the energy conservation measures noted within this report. Below are a few alternative funding methods:

A. Incentive Programs:

Pay for Performance

The New Jersey Smart Start Pay for Performance Existing Buildings Program includes incentives based on savings resulted from implemented ECMs. The program is available for all buildings that were audited as part of the NJ Clean Energy's Local Government Energy Audit Program. The facility's participation in the program is assisted by an approved program partner. An "Energy Reduction Plan" is created with the facility and approved partner to shown at least 15% reduction in the building's current energy use. Multiple energy conservation measures implemented together are applicable toward the total savings of at least 15%. No more than 50% of the total energy savings can result from lighting upgrades / changes.

Total incentive is capped at 50% of the project cost. The program savings is broken down into three benchmarks; Energy Reduction Plan, Project Implementation, and Measurement and Verification. Each step provides additional incentives as the energy reduction project continues. The benchmark incentives are as follows:

1. Energy Reduction Plan – Upon completion of an energy reduction plan by an approved program partner, the incentive will grant $0.10 per square foot between $5,000 and $50,000, and not to exceed 50% of the facility's annual energy expense. (Benchmark #1 is not provided in addition to the local government energy audit program incentive.)

2. Project Implementation – Upon installation of the recommended measures along with the "Substantial Completion Construction Report," the incentive will grant savings per KWH or Therm based on the program's rates. Minimum saving must be 15%. (Example $0.09 / kWh for 15% savings, $0.10/ kWh for 17% savings, … and $0.90 / Therm for 15% savings, $1.00 / Therm for 17% saving, …) Increased incentives result from projected savings above 15%.

3. Measurement and Verification – Upon verification 12 months after implementation of all recommended measures, that actual savings have been achieved, based on a completed verification report, the incentive will grant additional savings per kWh or Therm based on the program's rates. Minimum savings must be 15%. (Example $0.09 / kWh for 15% savings, $0.10/ kWh for 17% savings, … and $0.90 / Therm for 15% savings, $1.00 / Therm for 17% saving, …) Increased incentives result from verified savings above 15%.

Based on the provided data within each facility report and the estimated energy savings of each measure, the following facilities are believed to qualify for the Pay for Performance Program; and using each Facility Project Summary program incentives were estimated.

POTENTIAL FACILITY PAY FOR PERFORMANCE INCENTIVES					
DESCRIPTION	**QUALIFY**	**INCENTIVE #1**	**INCENTIVE #2**	**INCENTIVE #3**	**TOTAL INCENTIVES**
Justice Complex	No	-	-	-	$0
New Jail	Yes	$8,400	$93,575.00	$93,575.00	$195,550
Court House	No	-	-	-	$0
Administration Building	Yes	$2,500	$39,532.15	$39,532.15	$81,564
P.E.E.R. Building - Parking Garage	Yes	$2,500	$116,932.41	$116,932.41	$236,365
Prosecutor's Office	Yes	$2,500	$15,949.08	$15,949.08	$34,398
Total	**4**				**$547,877**

Disclaimer: The Pay for Performance incentives outlined above have been estimated based on the current calculated energy savings for the measures outlined in each facility report. Qualification for the program has been based on meeting the minimum demand threshold of 100 kilowatts and overall project meeting the minimum 15% source energy reduction requirement. This preliminary qualification analysis does not guarantee program incentives or acceptance into the program. The owner will be required to retain a Program Partner and formally apply to the program to determine final project incentives.

Direct Install Program

The New Jersey Clean Energy's Direct Install Program is a state funded program that targets small commercial and industrial facilities with peak demand of less than 200 kW. This turnkey program is aimed at providing owners a seamless, comprehensive process for analysis, equipment replacement and financial incentives to reduce consumption, lower utility costs and improve profitability. The program covers up to 70% of the cost for eligible upgrades including lighting, lighting controls, refrigeration, HVAC, motors, variable speed drives, natural gas and food service. Participating contractors (refer to www.njcleanenergy.com) conduct energy assessments in addition to your standard local government energy audit and install the cost-effective measures.

The following facilities qualify to apply for the Direct Install Program based on current program criteria.

DIRECT INSTALL PROGRAM	
DESCRIPTION	**QUALIFY**
Justice Complex	No
New Jail	No
Court House	No
Administration Building	No
P.E.E.R. Building - Parking Garage	No
Prosecutor's Office	Yes
Total	**1**

Smart Start Program

Prescriptive Measures - The New Jersey Clean Energy's Smart Start prescriptive measures incentives include unit pricing incentives for installation of energy efficient equipment and controls. Proposed equipment and controls must meet the minimum efficiency requirements as well as other application requirements. The Smart Start prescriptive incentives applicable for new construction, renovations, remodeling and equipment replacements, for a wide range of equipment including:

- Electric Chillers
- Gas Cooling
- Electric Unitary HVAC
- Ground Source Heat Pumps
- Gas Heating
- Variable Frequency Drives
- Gas Water Heating
- Premium Motors
- Prescriptive Lighting
- Lighting Controls
- Commercial Kitchen Equipment
- Technical Studies

Custom Measures - The New Jersey Clean Energy's Smart Start prescriptive measures incentives include all measures not identified in the prescriptive measures category or measures that must have savings verified through additional analysis such as energy model simulations. Custom measures are intended to include savings as a result of unique energy efficiency measures, which are typically facility specific such as waste heat recovery. Custom incentives are provided based on the amount of energy saved and minimum internal rate of return in order to be eligible.

The owner should refer to the Clean Energy Program website for further details on specific incentives available. (www.njcleanenergy.com)

Concord Engineering recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

B. Financing Options:

Municipal Bonds

Municipal bonds are a bond issued by a city or other local government, or their agencies. Potential issuers of municipal bonds include cities, counties, redevelopment agencies, school districts, publicly owned airports and seaports, and any other governmental entity (or group of governments) below the state level. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

Power Purchase Agreement

Public Law 2008, Chapter 3 authorizes contracts of up to fifteen (15) years for energy purchase contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system. These renewable energy systems are typically solar panels, windmills or other systems that create renewable energy. In exchange for the third party's work of installing, maintaining and owning the renewable energy system, the contracting unit (Owner) agrees to purchase the power generated by the renewable energy system from the third party at agreed upon energy rates.

Energy Savings Improvement Program (ESIP):

Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. The "Energy Savings Improvement Program (ESIP)" law provides a flexible approach that can allow all government agencies in New Jersey to improve and reduce energy usage with minimal expenditure of new financial resources. This program provides public entities to make valuable facility infrastructure improvements that are associated with energy savings. All energy savings projects are eligible as long as the financing period does not extend beyond 15 years. The financing can be utilized for all aspects of energy efficiency project implementation including, energy savings plan development, engineering, construction management, construction management, commissioning, and measurement and verification.

This program provides the much needed financing for energy efficiency projects without the burden of increased debt. The program allows for procurement of financing without voter approval or extending existing dept. The program requires evaluation to ensure a positive cash-flow through the entire 15 year financing period. The first phase of implementing an ESIP is the development of an Energy Savings Plan (ESP) to verify the energy savings, construction costs, and overall financial model.

VIII. ENERGY AUDIT ASSUMPTIONS

The assumptions utilized in this energy audit include but are not limited to following:

A. Cost Estimates noted within this report are based on industry accepted costing data such as RS Means™ Cost Data, contractor pricing and engineering estimates. All cost estimates for this level of auditing are +/- 20%. Prevailing wage rates for the specified region has been utilized to calculate installation costs. The cost estimates indicated within this audit should be utilized by the owner for prioritizing further project development post the energy audit. Project development would include investment grade auditing and detailed engineering.
B. Energy savings noted within this audit are calculated utilizing industry standard procedures and accepted engineering assumptions. For this level of auditing, energy savings are not guaranteed.
C. Information gathering for each facility is strongly based on interviews with operations personnel. Information dependent on verbal feedback is used for calculation assumptions including but not limited to the Operating Hours, Equipment Type, Control Strategies, and Scheduling.
D. Information contained within the major equipment list is based on the existing owner documentation where available (drawings, O&M manuals, etc.). If existing owner documentation is not available, catalog information is utilized to populate the required information.
E. Equipment incentives and energy credits are based on current pricing and status of rebate programs. Rebate availability is dependent on the individual program funding and applicability. It is the owner's responsibility to ensure installed measure equipment meets NJOCE program rules and requirements to receive incentives.
F. Equipment (HVAC, Plumbing, Electrical, & Lighting) noted within an ECM recommendation is strictly noted as a **basis for calculation** of energy savings. The owner should use this equipment information as a benchmark when pursuing further investment grade project development and detailed engineering for specific energy conservation measures.
G. Utility bill annual averages are utilized for calculation of all energy costs unless otherwise noted. Accuracy of the utility energy usage and costs are based on the information provided. Utility information including usage and costs is estimated where incomplete data is provided.
H. Greenhouse Gas Emissions are calculated for each ECM, the basis for these emissions reductions are NJCEP published standard emissions factors, which are the following:.
    a. Electric Savings:
        1. CO_2: 1.52 lbs/kWh
        2. NO_X: 0.0028 lbs/kWh
        3. SO_2: 0.0065 lbs/kWh
    b. Natural Gas Savings:
        1. CO_2: 11.7 lbs/therm
        2. NO_X: 0.0092 lbs/therm

OCEAN COUNTY

JUSTICE COMPLEX

120 HOOPER AVENUE
TOMS RIVER, NJ 08753

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	General Service Primary (GSP)
Third Party Supplier:	N/A

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	General Service Large (GSL)
Third Party Supplier:	Hess Corporation

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: JCP&L
Rate: General Service Primary
Meter No: L97024394
Account No: 10-00-17-9102-15
Third Party Utility Provider: -
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Feb-13	304,875	515.0	$30,412
Mar-13	274,134	512.0	$28,283
Apr-13	285,971	650.9	$29,685
May-13	298,229	579.7	$30,015
Jun-13	429,452	749.4	$44,329
Jul-13	459,992	814.1	$55,697
Aug-13	466,372	803.2	$49,196
Sep-13	421,328	772.5	$46,108
Oct-13	398,348	738.6	$39,678
Nov-13	353,708	673.9	$37,008
Dec-13	298,213	537.6	$34,782
Jan-14	292,869	506.2	$47,964
Totals	**4,283,491**	**814.1 Max**	**$473,158**

AVERAGE DEMAND **654.4 KW average**
AVERAGE RATE **$0.110** **$/kWh**

Figure 1
Electricity Usage Profile

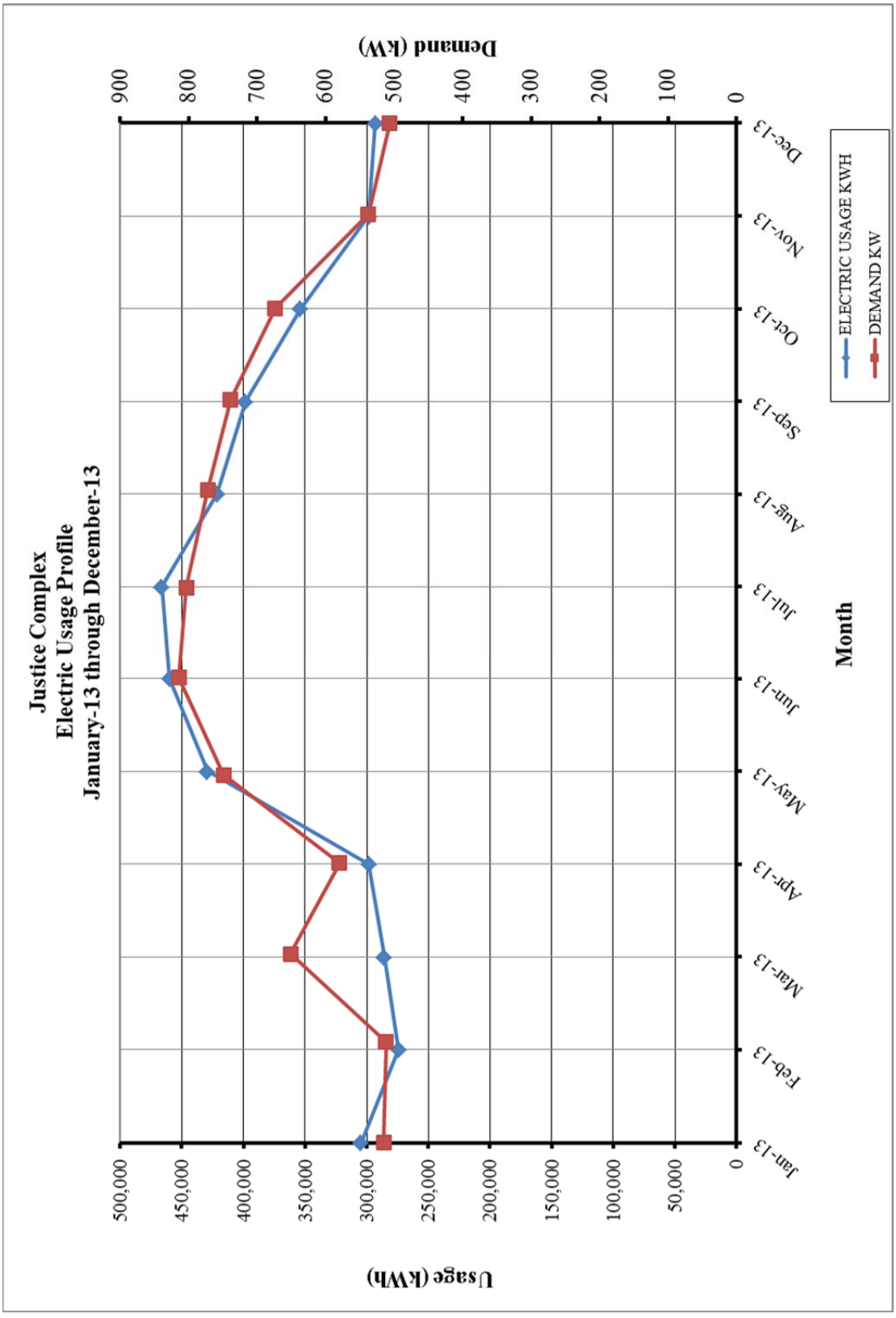
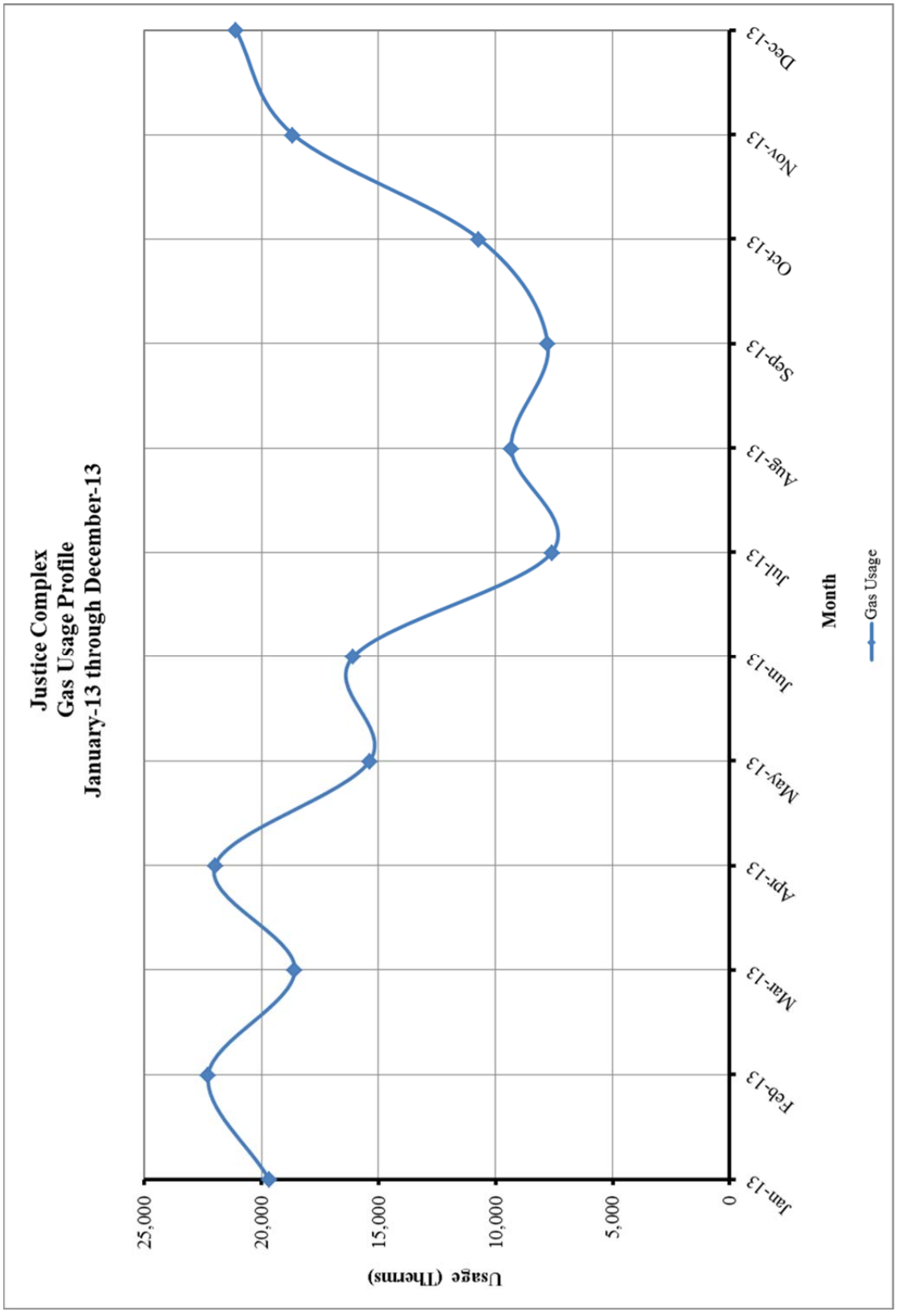


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: New Jersey Natural Gas		
Rate: GSL		
Meter No: 00851442		
Account No: 19-4510-0047-12		
Third Party Utility Provider: Hess		
TPS Meter No: -		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-13	19,684.94	$13,996.80
Feb-13	22,276.78	$15,839.70
Mar-13	18,578.97	$13,210.41
Apr-13	21,986.92	$25,137.94
May-13	15,369.02	$18,762.23
Jun-13	16,073.54	$19,693.16
Jul-13	7,596.74	$10,529.47
Aug-13	9,342.36	$11,558.42
Sep-13	7,775.99	$10,497.79
Oct-13	10,708.54	$13,888.98
Nov-13	18,659.59	$21,260.04
Dec-13	21,112.12	$24,421.56
TOTALS	**189,165.52**	**$198,796.49**
AVERAGE RATE:	**$1.05**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Ocean County Justice Complex is located at 120 Hooper Avenue in Toms River, New Jersey. This 164,000 SF, 4-story facility was designed and constructed from 1982 through 1985 and houses the Courts, Sheriff's offices and the Old County Jail. The facility is comprised of seven (7) courtrooms, old county jail, criminal records offices, bail office, family court, sheriff's offices, trial court administrator's offices, conference rooms, computer services, file storage and mechanical HVAC spaces.

Occupancy Profile

The typical hours of operation for most of the facility are Monday through Friday between 8:00 am and 5:00 pm. The County Jail Area located on the 4th and 5th floors is occupied 24 hours, 7 days per week.

Building Envelope

Exterior walls for the building are masonry brick faced with a concrete block construction. The windows throughout the facility are in very good condition. Typical windows are double pane, 1/4" with aluminum frames. The roof is a bitumen built-up system.

Exterior of the building consists of stone and precast concrete panel masonry façade with sinter block walls along with single pane, glazed windows with operable aluminum frames. Blinds are utilized through the facility per occupant comfort. The blinds are valuable because they help to reduce heat loss in the winter and reduce solar heat in the summer. The building has two main entrances with double door configuration for energy efficiency. The building is connected to the other two courthouse complex buildings via covered walkways and tunnels.

This building is constructed of a built-up roof with tar covering. There appears to be minimal insulation below the roof. However, the amount of insulation below the roofing could not be verified.

HVAC System

Most of the HVAC equipment that was inspected is beyond the ASHRAE service life as outlined in the 2011 Handbook – HVAC Applications, Chapter 37 and are overdue for replacement. In addition, the boilers and chiller are oversized for the existing heating and cooling loads. By replacing/upgrading most of the HVAC equipment, an immediate improvement in efficiencies will be realized.

The heating for the building is achieved via two (2), Cleaver-Brooks Model CB200-500, steam boilers located in MER 1 (central boiler room). These gas-fired, fire-tube 500 HP boilers are over 32 years old and beyond the ASHRAE service life of 25 years. The original name plates on each boiler indicate that each boiler's rated input capacity is 20,922 MBH and the total output capacity is 16,700 MBH. However, since these boilers are oversized for the existing loads, the boilers run at partial load through most of the year and are rated at 70% thermal efficiency under these conditions. During Concord Engineering's field inspection on April 3, 2014, the steam

boiler on line was frequently cycling on and off due to the partial load condition. The steam is currently transported to a series of steam to hot water heat exchangers that serve various heating loads throughout the building as well as the domestic hot water generators. The low firing rates of these boilers along with steam loses in the piping system/steam traps and the steam to hot water heat exchangers results in low efficiency throughout the steam system.

The steam plant is equipped with a Cleaver-Brooks deaerator (DA) rated at approximately 42,000 lbs/hr. with 1,000 cu. ft. of storage. The deaerator removes oxygen and other dissolved gases in the boiler feed water. The unit also accepts returned condensate before cold make-up water which saves energy. Condensate is returned to a receiver tank in the steam plant and pumped to the deaerator. Condensate return temperature to the receiver tank during the site inspection was around 162°F while the temperature of the cold make-up water was 57°F. Three (3) 2-HP pumps underneath the deaerator tank pump feed water to the steam boilers. The temperature of the feed water to the steam boilers was observed to be 188°F.

Cooling for the facility is provided by a Carrier Model 19DK7873CL water-cooled, centrifugal, electric chiller that is also 32 years old and beyond the ASHRAE service life of 25 years. This chiller feeds six (6) air handlers that contain chilled water coils. A Marley Model NC8304 cooling tower rated at a nominal 362 Tons provides 1,050 GPM of 85°F condenser water to the chiller via two (2) Bell & Gossett Model 1510 5E 30-HP pumps. These pump motors are controlled by a variable speed controller manufactured by Honeywell. The chilled water is pumped to the chilled water coils in each air handling unit via two (2) Bell & Gossett Model 1510 pumps.

The boilers and the chiller in the central plant are oversized for the present heating and cooling loads and are therefore very inefficient in the summer months. One steam boiler is sufficient to carry the peak load during the winter and the chiller runs at partial load during the entire cooling season. The upper floors of the facility are served by rooftop DX units.

The central air handling units have hot water and chilled water coils along with booster pumps that feed various VAV boxes with hot water reheat.

1985 Jail

The Justice Complex 4th and 5th floors houses inmates along with part of the basement level for jail services. The inmate dorms are conditioned by three large packaged rooftop units with direct expansion cooling and hot water heating. These units are manufactured by Trane with a cooling capacity of 40 tons each. Each unit has a 10 horsepower supply fan and two 1 ½ horsepower exhaust fans. These units were recently installed in 2012.

There is a classroom area and indoor gym that are conditioned by two Govern Air rooftop units. Each unit is rated at 20 tons of cooling capacity and is equipped with hot water heating. These units each have a 5 horsepower supply fan and are original to the building.

There is a single indoor air handler (AHU-5) located on the third floor that feed part of that floor. The unit is manufactured by Carrier and has split condensing unit located on the roof behind

West A. This unit is constant volume with 12 tons of cooling capacity and a hot water heating coil. The unit has a 3 horsepower supply fan and separate utility set return fan with a 1 horsepower motor. The Carrier unit is original to the building.

Exhaust System

There are several exhaust fans on the roof that serve toilets, mechanical rooms, storage rooms, and general exhaust.

1985 Jail

The general and toilet exhaust fans located on the roof, which are down blast type fans with fractional horsepower motors. The Kitchen Hood exhaust air is attached to a utility set fan located on the Lower Roof behind West "E" Section. The fan is manufactured by Cook with a constant volume 7 ½ horsepower motor and exhaust airflow of 10,000 cubic feet per minute.

HVAC System Controls

The Justice Complex does not have a central automation system. The steam boilers in this facility are started and stopped manually by the boiler operators. The boilers are equipped with 1984 vintage burner controllers with no modulation capability. The balance of the controls such as steam control valves, thermostatic controllers, etc. are pneumatic. The chiller, cooling tower fans, condenser water pumps (P-1 & P-2), chilled water pumps (P-3 & P-4), valves, dampers, etc. are controlled by a Johnson Controls pneumatic system. All the dampers, fans, hot water coils, chilled water coils for AHU-1 thru AHU-4 are controlled by pneumatic actuators/valves, a Johnson Controls field panel and a variable air volume control center manufactured by Air Monitor Corporation that includes an air monitoring station at the discharge of each AHU.

Domestic Hot Water

Domestic hot water for the facility is produced by several domestic hot water generators with steam coils in the storage tanks located adjacent to the boiler room and across the corridor from the kitchen.

Lighting

Refer to the Investment Grade lighting Audit Appendix for a detailed list of the lighting throughout the facility and estimated operating hours per space.

Laundry

The laundry that services the inmates is located on the basement level of the Justice Complex. The laundry operates at night only from approximately 8:00 pm till 4:00 am at the latest. There are currently four Alliance 80 pound washing machines, of which two are inoperable. There are two electric dryers manufactured by Wascomat and Cissel rated at 75.6 kW and 60 kW.

Kitchen

The kitchen that services the entire Jail is located on the basement level of the Justice Complex. The kitchen serves three meals a day. The main cooking area consists of three 12 foot Captive Air grease exhaust hoods each with gas fired cooking equipment underneath.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade - Justice Complex	$180,575	$10,361	17.4	-13.9%
ECM #2	Exterior Lighting Upgrade - Justice Complex	$17,265	$1,404	12.3	22.0%
ECM #3	Lighting Controls Upgrade - Justice Complex	$8,265	$728	11.4	32.1%
ECM #4	Lighting Upgrade - 1985 Jail	$156,830	$29,539	5.3	182.5%
ECM #5	Lighting Controls Upgrade - 1985 Jail	$720	$140	5.1	191.7%
ECM #6A	Boiler Burner & Burner Controls Upgrade	$200,000	$15,890	12.6	66.8%
ECM #6B	Steam System Expansion to New Jail	$101,145	$10,128	10.0	50.2%
ECM #6C	Condensing Boiler Upgrade	$1,070,500	$39,574	27.1	-7.6%
ECM #7	Water Cooled Chiller Upgrade	$283,925	$17,003	16.7	49.7%
ECM #8	NEMA Premium Motors Condenser Water Pumps	$13,764	$1,015	13.6	32.7%
ECM #9	VFD on Cooling Tower Fans	$33,500	$4,231	7.9	89.4%
ECM #10	NEMA Premium Motors Return Fans	$11,980	$749	16.0	12.5%
ECM #11	Automatic Boiler Blowdown Controls	$7,700	$418	18.4	-18.6%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Lighting Upgrade - Justice Complex	29.8	94,189	0
ECM #2	Exterior Lighting Upgrade - Justice Complex	3.2	12,768	0
ECM #3	Lighting Controls Upgrade - Justice Complex	0.0	6,620	0
ECM #4	Lighting Upgrade - 1985 Jail	40.7	268,540	0
ECM #5	Lighting Controls Upgrade - 1985 Jail	0.0	1,274	0
ECM #6A	Boiler Burner & Burner Controls Upgrade	0.0	0	15,133
ECM #6B	Steam System Expansion to New Jail	0.0	0	9,645
ECM #6C	Condensing Boiler Upgrade	0.0	0	37,689
ECM #7	Water Cooled Chiller Upgrade	70.0	123,371	0
ECM #8	NEMA Premium Motors Condenser Water Pumps	2.3	9,230	0
ECM #9	VFD on Cooling Tower Fans	0.0	38,462	0
ECM #10	NEMA Premium Motors Return Fans	2.0	6,809	0
ECM #11	Automatic Boiler Blowdown Controls	0.0	0	398

Table 3
ECM Emissions Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	GREENHOUSE GAS EMISSIONS REDUCTION		
		CO_2 EMISSIONS (LBS)	NO_X EMISSIONS (LBS)	SO_2 EMISSIONS (LBS)
ECM #1	Lighting Upgrade - Justice Complex	143,167	264	612
ECM #2	Exterior Lighting Upgrade - Justice Complex	19,407	36	83
ECM #3	Lighting Controls Upgrade - Justice Complex	10,062	19	43
ECM #4	Lighting Upgrade - 1985 Jail	408,181	752	1,746
ECM #5	Lighting Controls Upgrade - 1985 Jail	1,936	4	8
ECM #6A	Boiler Burner & Burner Controls Upgrade	177,056	139	0
ECM #6B	Steam System Expansion to New Jail	112,847	89	0
ECM #6C	Condensing Boiler Upgrade	440,961	347	0
ECM #7	Water Cooled Chiller Upgrade	187,524	345	802
ECM #8	NEMA Premium Motors Condenser Water Pumps	14,030	26	60
ECM #9	VFD on Cooling Tower Fans	58,462	108	250
ECM #10	NEMA Premium Motors Return Fans	10,350	19	44
ECM #11	Automatic Boiler Blowdown Controls	4,657	4	0
Notes:	A. Emissions Reduction based on NJCEP published factors for electric & gas.			

Table 4
Facility Project Summary

FACILITY PROJECT SUMMARY TABLE					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade - Justice Complex	$10,361	$215,915	$35,340	$180,575	17.4
Exterior Lighting Upgrade - Justice Complex	$1,404	$17,265	$0	$17,265	12.3
Lighting Controls Upgrade - Justice Complex	$728	$9,250	$985	$8,265	11.4
Lighting Upgrade - 1985 Jail	$29,539	$159,010	$2,180	$156,830	5.3
Lighting Controls Upgrade - 1985 Jail	$140	$800	$80	$720	5.1
~~Boiler Burner & Burner Controls Upgrade~~	~~$15,890~~	~~$200,000~~	~~$0~~	~~$200,000~~	~~12.6~~
Steam System Expansion to New Jail	$10,128	$101,145	$0	$101,145	10.0
~~Condensing Boiler Upgrade~~	~~$39,574~~	~~$1,122,000~~	~~$51,500~~	~~$1,070,500~~	~~27.1~~
Water Cooled Chiller Upgrade	$17,003	$288,125	$4,200	$283,925	16.7
NEMA Premium Motors Condenser Water Pumps	$1,015	$13,764	$0	$13,764	13.6
VFD on Cooling Tower Fans	$4,231	$35,000	$1,500	$33,500	7.9
NEMA Premium Motors Return Fans	$749	$11,980	$0	$11,980	16.0
Automatic Boiler Blowdown Controls	$418	$7,700	$0	$7,700	18.4
Total Project	**$75,716**	**$859,954**	**$44,285**	**$815,669**	**10.8**

Note the measure totals in this table do not take into account interactive effects of measures; see Method of Analysis Section III in Executive Report for further explanation.

This project does not qualify for additional incentives through the Pay for Performance Program, please see the Installation Funding Options section for additional program options.

ECM #1: Lighting Upgrade – General

Description:

The majority of the interior lighting throughout the Justice Complex is provided with fluorescent fixtures with older generation, 32W T8 lamps and electronic ballasts. Additionally, there are several areas that still contain T12 fixtures with magnetic ballasts. These fixtures can be replaced and retrofit with new LED type fixtures and lamps.

This ECM includes replacing and retrofitting the interior lighting with new LED type lamps and fixtures. It is recommended the County consult with a professional engineer prior to retrofitting or replacing fixtures to ensure code required minimum light levels will be met.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	29.8
Electric Usage Savings (kWh)	94,189
Electric Cost Savings ($)	$10,361

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$215,915
NJ Smart Start Equipment Incentive ($):	$35,340
Net Installation Cost ($):	$180,575
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$10,361
Total Yearly Savings ($/Yr):	$10,361
Estimated ECM Lifetime (Yr):	15
Simple Payback	17.4
Simple Lifetime ROI	-13.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$155,415
Internal Rate of Return (IRR)	-2%
Net Present Value (NPV)	($56,886.05)

ECM #2: Lighting Upgrade – Exterior Lighting

Description:

The exterior lighting at the Justice Complex is currently lit by metal halide fixtures. The exterior would be better served with more efficient LED lighting system. Concord Engineering recommends upgrading the lighting to an energy-efficient LED lighting system that includes LED lamps and fixtures for the existing exterior lighting.

This ECM would replace the existing exterior lamps and fixtures with equivalent LED lamps and fixtures.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in **Investment Grade Lighting Audit Appendix** that outlines the proposed retrofits, costs, savings, and payback periods.

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	3.2
Electric Usage Savings (kWh)	12,768
Electric Cost Savings ($)	$1,404

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$17,265
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$17,265
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,404
Total Yearly Savings ($/Yr):	$1,404
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.3
Simple Lifetime ROI	22.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$21,060
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	($504.14)

ECM #3: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Justice Complex are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for mostly offices. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = (\%\ \text{Savings} \times \text{Controlled Light Energy}\ (\text{kWh/Yr}))$$

$$\text{Savings.} = \text{Energy Savings}\,(\text{kWh}) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Usage Savings (kWh)	6,620
Electric Cost Savings ($)	$728

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$9,250
NJ Smart Start Equipment Incentive ($):	$985
Net Installation Cost ($):	$8,265
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$728
Total Yearly Savings ($/Yr):	$728
Estimated ECM Lifetime (Yr):	15
Simple Payback	11.4
Simple Lifetime ROI	32.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$10,920
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$425.82

ECM #4: Lighting Upgrade – General

Description:

The majority of the interior lighting throughout the 1985 Jail is provided with T12 fluorescent fixtures with magnetic ballasts. There are also fluorescent fixtures with older generation, 32W T8 lamps and electronic ballasts within the facility. This ECM includes retrofitting the interior lighting with new LED type lamps and fixtures.

This ECM also includes replacement of any incandescent lamps with Phillips EnduraLED lamps which can be retrofit into existing incandescent A-lamp fixtures. LED fixtures provide equivalent lumens and much longer burn hours but at reduced wattages. It is recommended the District consult with a professional engineer prior to retrofitting fixtures to ensure code required minimum light levels will be met.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	40.7
Electric Usage Savings (kWh)	268,540
Electric Cost Savings ($)	$29,539

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$159,010
NJ Smart Start Equipment Incentive ($):	$2,180
Net Installation Cost ($):	$156,830
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$29,539
Total Yearly Savings ($/Yr):	$29,539
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.3
Simple Lifetime ROI	182.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$443,085
Internal Rate of Return (IRR)	17%
Net Present Value (NPV)	$195,804.66

ECM #5: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the 1985 Jail are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for mostly offices. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = \left(\%\ \text{Savings} \times \text{Controlled Light Energy}\ \left(\text{kWh/Yr}\right)\right)$$

$$\text{Savings.} = \text{Energy Savings}\left(\text{kWh}\right) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	1,274
Electric Cost Savings ($)	$140

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$800
NJ Smart Start Equipment Incentive ($):	$80
Net Installation Cost ($):	$720
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$140
Total Yearly Savings ($/Yr):	$140
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.1
Simple Lifetime ROI	191.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$2,100
Internal Rate of Return (IRR)	18%
Net Present Value (NPV)	$951.31

ECM #6A: Steam Boiler Burner/Controls Upgrade

Description:

The majority of the heating is provided to the Justice Complex by Cleaver Brooks 500 Boiler Horsepower (BHP) natural gas-fired boilers that produces steam for the heating season and domestic hot water throughout the year. The boilers are 1982 vintage and are well maintained and currently should be capable of achieving an efficiency rating of 70 percent while operating. Given the limitations of the current system burner and controls and the vast improvement in boiler controls today over what was available then, it is recommended that a burner and new controls upgrade be performed.

This ECM will install new Cleaver Brooks Profire burner with Honeywell controls on each of these boilers with separate motors that will control fuel flow, excess air oxygen trim and variable speed on the blower. Installation of this system will result in improved operating efficiency of the boilers and less cycling of boilers since the boilers can operate closer to the demanded load requirement. These burners can also be equipped with parallel positioning for further control.

Energy Savings Using Hand Calculations:

$$Annual\ Heating\ Energy\ Savings = Existing\ Fuel\ Consumption\ x\ 8\%\ Efficiency\ \ Increase$$

$$Heating\ Cost\ Savings = Annual\ Heating\ Energy\ Savings\ x\ Fuel\ Cost\ \frac{\$}{Unit}$$

Energy Savings Summary:

ECM #6A - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$200,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$200,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$15,890
Total Yearly Savings ($/Yr):	$15,890
Estimated ECM Lifetime (Yr):	21
Simple Payback	12.6
Simple Lifetime ROI	66.8%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$333,690
Internal Rate of Return (IRR)	5%
Net Present Value (NPV)	$44,944.73

ECM # 6B: Steam System Expansion to New Jail

Description:

The Justice Complex is heated by a central steam boiler plant located in the central boiler room and the new jail is heated by two gas-fired hot water boilers located in the new jail boiler room. The existing steam system has been oversized due to a cancelled addition, therefore, the existing steam system has been operating at part load for most of the year, resulting in less efficient steam production. If the existing steam system could obtain the additional load from the new jail to fulfill the steam boiler's capacity rating, the steam system could operate at full load and provide more efficient steam.

This energy conservation measure will bypass the existing H.B. Smith gas-fired, cast iron, sectional hot water boilers serving the new jail facility and connect the existing steam boiler system to the new jail via a steam to hot water heat exchanger. Steam boiler operational efficiencies have been provided by Cleaver Brooks to substantiate the increase in efficiency at full load conditions.

Energy Savings Calculations:

Gas consumption of the boiler plant is gathered in order to calculate the estimated heat output of the existing boilers.

The annual gas consumption is used in a reverse calculation in the below equations to obtain proposed annual gas consumption based on improved efficiency. Calculations are summarized in the table below.

$$\text{Annual Output, MMBTU} = \frac{\text{Consumption (Therms)} \times 100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ Current Boiler Effc}}{1{,}000{,}000}$$

$$\text{Proposed Gas Consumption, Therms} = \frac{\text{Annual Output (MMBTU)} \times 1{,}000{,}000}{100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ New Boiler Efficiency}}$$

STEAM BOILER SYSTEM EXPANSION CALCULATIONS				
ECM INPUTS	**EXISTING**		**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Old Jail Boilers	Existing New Jail Boilers	Total Load on Old Jail Boilers	
Existing Nat Gas (Therms)	157,610	12,930	170,540	
Boiler Efficiency (%)	70.0%	80.0%	75.0%	5%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	11,033	1,034	12,067	
Gas Cost ($/Therm)	$1.05	$1.05	$1.05	
ENERGY SAVINGS CALCULATIONS				
ECM RESULTS	**EXISTING**		**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	157,610	12,930	160,895	9,645
Energy Cost ($)	$165,490	$13,577	$168,939	$10,128
COMMENTS:				

Energy Savings Summary:

ECM #6B - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$101,145
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$101,145
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$10,128
Total Yearly Savings ($/Yr):	$10,128
Estimated ECM Lifetime (Yr):	15
Simple Payback	10.0
Simple Lifetime ROI	50.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$151,920
Internal Rate of Return (IRR)	6%
Net Present Value (NPV)	$19,762.41

ECM # 6C: High-Efficiency, Modular, Condensing Boiler Upgrade

Description:

The Justice Complex is heated by a central steam boiler plant located in the boiler room. Steam is provided by two (2) Cleaver Brooks Model CB200-500 gas-fired, fire-tube boilers each rated at an input capacity of 20,922 MBH and a rated output capacity of 16,700 MBH when new. The boilers were manufactured in 1982, are in average condition, and beyond their service life along with using more gas than high-efficiency, condensing, modular units. In addition, the current steam system is antiquated and less efficient than a hot water system. Removing the steam system components and installing all new hot water piping and equipment would bolster the system's efficiency.

CEG recommends replacing these boilers with five (5) 6,000 MBH high-efficiency, condensing, modular hot water boilers. Condensing boilers can substantially improve the operating efficiency of the heating system of the building. A condensing boiler's peak efficiency tops out at 98% depending on return water temperature. The natural gas to water efficiency for a 6,000 MBH modular boiler with digital burner controls is approximately 92% over its operating range and with the advanced controls and a 5:1 turn down ratio.

This energy conservation measure would replace the existing Cleaver Brooks gas-fired, fire-tube, steam boilers serving the facility with high-efficiency, modular, condensing heating hot water boilers. Calculation is based on the following equipment: Aerco BMK 6.0, modular, condensing hot water boiler or equivalent. Additionally, there will need to be major piping renovations and if this project is chosen to proceed into design, Concord suggests further engineering evaluation of the system.

Energy Savings Calculations:

Gas consumption of the boiler plant is gathered in order to calculate the estimated heat output of the existing boilers. It is confirmed that the boiler does provide domestic hot water heating as well.

The annual gas consumption is used in a reverse calculation in the below equations to obtain proposed annual gas consumption based on improved efficiency. Calculations are summarized in the table below.

$$\text{Annual Output, MMBTU} = \frac{\text{Consumption (Therms)} \times 100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ Current Boiler Effc}}{1{,}000{,}000}$$

$$\text{Proposed Gas Consumption, Therms} = \frac{\text{Annual Output (MMBTU)} \times 1{,}000{,}000}{100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ New Boiler Efficiency}}$$

HIGH EFFICIENCY BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Fire-Tube Boilers	New High Efficiency Boilers	
Existing Nat Gas (Therms)	157,610		
Boiler Efficiency (%)	70.0%	92.0%	22%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	11,033	11,033	
Gas Cost ($/Therm)	$1.05	$1.05	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	157,610	119,921	37,689
Energy Cost ($)	$165,491	$125,917	$39,574
COMMENTS:	Boiler Efficiency Based on age of boiler, and average of both boilers		

Energy Savings Summary:

ECM #6C - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$1,122,000
NJ Smart Start Equipment Incentive ($):	$51,500
Net Installation Cost ($):	$1,070,500
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$39,574
Total Yearly Savings ($/Yr):	$39,574
Estimated ECM Lifetime (Yr):	25
Simple Payback	27.1
Simple Lifetime ROI	-7.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$989,350
Internal Rate of Return (IRR)	-1%
Net Present Value (NPV)	($381,392.09)

Note: NJ Smart Incentive is based on the Custom Measure path. This incentive is a conservative estimate and is not guaranteed.

ECM #7: Chiller Replacement

Description:

The Justice Complex has a 350-Ton water-cooled chiller in the mechanical room which supplies chilled water to the air handling units. The chiller has surpassed its useful life and could be replaced with a much more efficient chiller.

It is pertinent to note that based on the information gathered from the survey, an addition was to be constructed for the Justice Complex but never came to fruition and the chilled water system had been sized and installed previously with the additional capacity in mind. Therefore, Concord estimates that 70% of the time, the chiller is operating at part load conditions.

This ECM includes the installation of a new high efficient water-cooled chiller. The new chiller is based on a 350-Ton York Model YMC.

Energy Savings Calculations:

$$\text{Electric Usage} = \text{Capacity (tons)} \times \frac{12{,}000\ \text{Btu}}{1000\ \text{W}} \times \frac{1}{\text{EER}} \times \text{Operating Hours}$$

$$\text{Demand Savings} = \text{Capacity (tons)} \times \left(\frac{1}{\text{EER}_{\text{Old}}} - \frac{1}{\text{EER}_{\text{New}}}\right) \times 67\%\ \text{Capacity Factor}$$

$$\text{Energy Cost} = \text{Electric Usage (kWh)} \times \text{Rate} \left(\frac{\$}{\text{kWh}}\right)$$

CHILLER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Water Cooled Chiller	High Efficiency Chiller	
Operating Capacity (Tons)	350.0	350.0	
Chiller Efficiency (EER)	17.8	25.5	
Full Load Cooling Hrs (Est.)	1,000	1,000	
Cooling Energy (kWh)	235,955	164,706	
Chiller Operating Hours (Total)	3,000	3,000	
Chiller Part Load Hours Est.	2,000	2,000	
Chiller IPLV (EER)	19.0	26.0	
Chiller Part Load %	70.0%	70.0%	
Part Load Cooling Energy (kWh)	309,474	226,154	
Elec Cost ($/kWh)	0.110	0.110	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	545,429	390,860	154,569
Electric Demand (KW)	158.1	110.4	47.7
Electric Energy Cost ($)	$59,997	$42,995	$17,003
COMMENTS:			

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$288,125
NJ Smart Start Equipment Incentive ($):	$4,200
Net Installation Cost ($):	$283,925
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$17,003
Total Yearly Savings ($/Yr):	$17,003
Estimated ECM Lifetime (Yr):	25
Simple Payback	16.7
Simple Lifetime ROI	49.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$425,075
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	$12,150.75

ECM #8: Install NEMA Premium® Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving two of the condenser water pumps (P-3 and P-4) are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors. NEMA Premium® is the most efficient motor designation in the marketplace today. (Note: There are currently no NJ OCE incentives for premium efficiency motors.)

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
P-3	Condenser Water Pump	30	3,600	88.5%	94.1%
P-4	Condenser Water Pump	30	3,600	88.5%	94.1%

Energy Savings Calculations:

$$\text{Electric usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate} \left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	QTY	MOTOR HP	LOAD FACTOR	EXISTING EFFICIENCY	PROPOSED EFFICIENCY	POWER SAVINGS kW	ENERGY SAVINGS kWH	COST SAVINGS
P-3	1	30	75%	88.5%	94.1%	1.13	4,615	$508
P-4	1	30	75%	88.5%	94.1%	1.13	4,615	$508
TOTAL						**2.3**	**9,230**	**$1,015**

Equipment Cost

The following table outlines the summary of motor replacement costs:

MOTOR REPLACEMENT SUMMARY						
EQMT ID	MOTOR POWER HP	INSTALLED COST	SMART START INCENTIVE	NET COST	TOTAL SAVINGS	SIMPLE PAYBACK
P-3	30	$6,882	$0	$6,882	$508	13.6
P-4	30	$6,882	$0	$6,882	$508	13.6
TOTAL		**$13,764**	**$0**	**$13,764**	**$1,015**	**13.6**

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$13,764
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$13,764
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,015
Total Yearly Savings ($/Yr):	$1,015
Estimated ECM Lifetime (Yr):	18
Simple Payback	13.6
Simple Lifetime ROI	32.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$18,270
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	$195.82

ECM #9: Install VFD on Cooling Tower Fan

Description:

The Cooling Tower for the Justice Complex is an older Marley Tower with a two speed fan. The installation of a VFD will allow the tower fan to modulate based on the required amount airflow needed to maintain the necessary condenser water temperature for the chiller.

This ECM includes the installation of a variable frequency drive and inverter duty premium efficiency motor on the tower fan along with the required tower controls to modulate the fan speed. It should be noted that the tower has not surpassed its useful life and retrofitting the tower is more cost effective then replacing the entire tower.

Energy Savings Calculations:

Load Factor = 75% (without VFD)

$$\text{Energy Consumption (kWh)} = \text{Motor HP} \times 0.746\frac{\text{kW}}{\text{HP}} \times \text{Hours of operation (Hr)} \times \frac{1}{\eta_{\text{motor}}}$$

$$\text{Total Energy Consumption (kWh)} = \sum \text{Energy Consumption of Each Motor}$$

$$\text{Energy Cost (\$)} = \text{Total Comsumption(kWh)} \times \text{Average Cost of Electric} \left(\frac{\$}{\text{kWh}}\right)$$

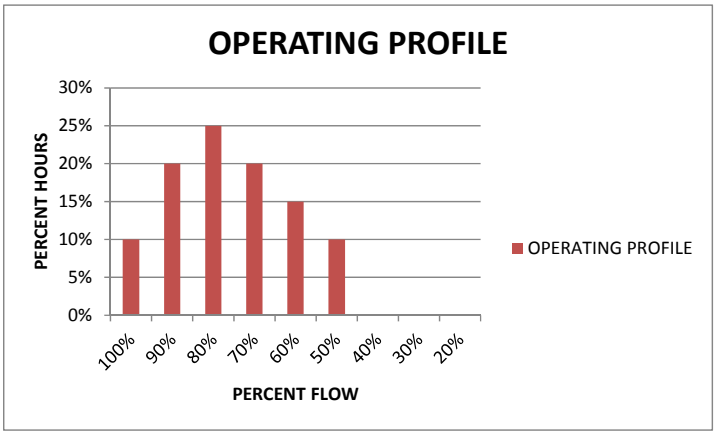
Affinity Laws are used in order to calculate energy savings by calculating the reduced power consumption requirement based a reduction in flow. Affinity laws, are as following:

Q = Flow, n = RPM, p = total pressure

$$\frac{Q_2}{Q_1} = \frac{n_2}{n_1} \qquad \frac{p_2}{p_1} = \left(\frac{n_2}{n_1}\right)^2 \qquad \frac{HP_2}{HP_1} = \left(\frac{n_2}{n_1}\right)^3$$

COOLING TOWER FAN VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Constant Fan	VFD Fan	
Control	On/Off	VFD	-
Quantiy of Fans	1	1	
Motor Nameplate HP	25.0	25.0	-
Motor Efficiency (%)	92.4%	93.6%	1.2%
Operating Hrs	3672	3672	-
Load Factor	75.0%	75.0%	
Elec Cost ($/kWh)	0.110	0.110	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	74,116	35,653	38,462
Electric Energy Cost ($)	$8,153	$3,922	$4,231
COMMENTS:			

Estimated Operating Profile with VFD



Energy Savings Summary:

ECM #9 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$35,000
NJ Smart Start Equipment Incentive ($):	$1,500
Net Installation Cost ($):	$33,500
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,231
Total Yearly Savings ($/Yr):	$4,231
Estimated ECM Lifetime (Yr):	15
Simple Payback	7.9
Simple Lifetime ROI	89.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$63,465
Internal Rate of Return (IRR)	9%
Net Present Value (NPV)	$17,009.40

ECM #10: Install NEMA Premium® Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving four of the return fans (RF-1, RF-2, RF-3, RF-4) for air handlers 1 through 4 are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors. NEMA Premium® is the most efficient motor designation in the marketplace today. (Note: There are currently no NJ OCE incentives for premium efficiency motors.)

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
AHU-1	Return Fan	15	3,600	87.5%	91.7%
AHU-2	Return Fan	10	3,600	84.0%	91.7%
AHU-3	Return Fan	15	3,600	87.5%	91.7%
AHU-4	Return Fan	10	3,600	84.0%	91.7%

Energy Savings Calculations:

$$\text{Electric usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate} \left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	QTY	MOTOR HP	LOAD FACTOR	EXISTING EFFICIENCY	PROPOSED EFFICIENCY	POWER SAVINGS kW	ENERGY SAVINGS kWH	COST SAVINGS
AHU-1	1	15	75%	87.5%	91.7%	0.44	1,498	$165
AHU-2	1	10	75%	84.0%	91.7%	0.56	1,907	$210
AHU-3	1	15	75%	87.5%	91.7%	0.44	1,498	$165
AHU-4	1	10	75%	84.0%	91.7%	0.56	1,907	$210
TOTAL						**2.0**	**6,809**	**$749**

Equipment Cost

The following table outlines the summary of motor replacement costs:

MOTOR REPLACEMENT SUMMARY						
EQMT ID	MOTOR POWER HP	INSTALLED COST	SMART START INCENTIVE	NET COST	TOTAL SAVINGS	SIMPLE PAYBACK
AHU-1	15	$2,995	$0	$2,995	$165	18.2
AHU-2	10	$2,995	$0	$2,995	$210	14.3
AHU-3	15	$2,995	$0	$2,995	$165	18.2
AHU-4	10	$2,995	$0	$2,995	$210	14.3
TOTAL		**$11,980**	**$0**	**$11,980**	**$749**	**16.0**

Energy Savings Summary:

ECM #10 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$11,980
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$11,980
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$749
Total Yearly Savings ($/Yr):	$749
Estimated ECM Lifetime (Yr):	18
Simple Payback	16.0
Simple Lifetime ROI	12.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$13,482
Internal Rate of Return (IRR)	1%
Net Present Value (NPV)	($1,678.62)

ECM #11: Automatic Boiler Blowdown Controls

Description:

Considering these boilers operate a significant portion of the year proper chemical balance and efficient maintenance is necessary to continue efficient operation. By automating the boiler blowdown sequence unnecessary performance of this procedure can be eliminated, thereby reducing chemical, water, and thermal waste.

This ECM would install automatic boiler blowdown controls on the two main steam boilers.

Energy Savings Calculations:

It is estimated the controls will provide a 2% reduction in blowdown operation, which was used to determine savings. Note this savings does not include water and chemical savings from converting to an automatic system.

$$\text{Fuel Use (therm)} = \text{Boiler Steam Capacity } \left(\frac{\text{lb}}{\text{hr}}\right) \times \text{Avg. Full Load Op Hours } \times \Delta\text{Enthalpy} \left(\frac{\text{Btu}}{\text{lb}}\right) \times \frac{1}{\text{Efficiency}} \times \frac{1 \text{ Therm}}{100{,}000 \text{ Btu}}$$

$$\text{Average Full Load Op Hours} = \text{Natural Gas Usage (Btu)} \times \frac{1}{\text{Boiler Capacity (Btu/h)}}$$

$$\Delta\text{Enthalpy} = \text{Steam Enthalpy (@PSI)} - \text{Makeup Water Enthalpy(@60F)}$$

AUTOMATIC BLOWDOWN CONTROL ANALYSIS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Blowdown	Automatic Blowdown	
Natuarl Gas Usage (Therms)	189,165	0	
Boiler Input Capacity (MBH)	20,922	20,922	
Average Full Load Operating Hours	904	904	
Boiler Valve Capacity (lbs/hr)	14,270	14,270	
Boiler Efficiency (%)	65%	65%	
Percent Blowdown Operation	8%	6%	2%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Gas Cost ($/Therm)	$1.050	$1.050	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	18,710	18,312	398
Energy Cost ($)	$19,646	$19,228	$418
COMMENTS:	Savings does not include water and chemical savings.		

Energy Savings Summary:

ECM #11 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$7,700
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$7,700
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$418
Total Yearly Savings ($/Yr):	$418
Estimated ECM Lifetime (Yr):	15
Simple Payback	18.4
Simple Lifetime ROI	-18.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$6,270
Internal Rate of Return (IRR)	-2%
Net Present Value (NPV)	($2,709.94)

Renewable Energy Measure (REM):

Currently the roof of the Justice Complex does not have space to accommodate the installation of a solar array due to the equipment located on the roof and skylight areas for prisoner day rooms. Therefore solar was not recommended for the Justice Complex. See Executive report for further recommendations concerning renewable energy measure alternatives.

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures. While facility staff may already perform some of these items, they are stated to remind the owner of the energy savings benefit of continual performance. These measures are typically not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode.

F. Replace any old CRT Monitors with LED/LCD Type Monitors, which can draw as much as a quarter the power of an equivalent CRT monitor.

G. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Ocean County - Justice Complex

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade - Justice Complex	$152,800	$63,115	$35,340	$180,575	$10,361	$0	$10,361	15	$155,415	$0	-13.9%	17.4	-1.82%	($56,886.05)
ECM #2	Exterior Lighting Upgrade - Justice Complex	$11,865	$5,400	$0	$17,265	$1,404	$0	$1,404	15	$21,060	$0	22.0%	12.3	2.59%	($504.14)
ECM #3	Lighting Controls Upgrade - Justice Complex	$6,200	$3,050	$985	$8,265	$728	$0	$728	15	$10,920	$0	32.1%	11.4	3.70%	$425.82
ECM #4	Lighting Upgrade - 1985 Jail	$89,630	$69,380	$2,180	$156,830	$29,539	$0	$29,539	15	$443,085	$0	182.5%	5.3	17.06%	$195,804.66
ECM #5	Lighting Controls Upgrade - 1985 Jail	$400	$400	$80	$720	$140	$0	$140	15	$2,100	$0	191.7%	5.1	17.77%	$951.31
ECM #6A	Boiler Burner & Burner Controls Upgrade	$100,000	$100,000	$0	$200,000	$15,890	$0	$15,890	21	$333,690	$0	66.8%	12.6	5.21%	$44,944.73
ECM #6B	Steam System Expansion to New Jail	$52,629	$48,516	$0	$101,145	$10,128	$0	$10,128	15	$151,920	$0	50.2%	10.0	5.58%	$19,762.41
ECM #6C	Condensing Boiler Upgrade	$484,000	$638,000	$51,500	$1,070,500	$39,574	$0	$39,574	25	$989,350	$0	-7.6%	27.1	-0.60%	($381,392.09)
ECM #7	Water Cooled Chiller Upgrade	$153,000	$135,125	$4,200	$283,925	$17,003	$0	$17,003	25	$425,075	$0	49.7%	16.7	3.38%	$12,150.75
ECM #8	NEMA Premium Motors Condenser Water Pumps	$6,924	$6,840	$0	$13,764	$1,015	$0	$1,015	18	$18,270	$0	32.7%	13.6	3.17%	$195.82
ECM #9	VFD on Cooling Tower Fans	$25,000	$10,000	$1,500	$33,500	$4,231	$0	$4,231	15	$63,465	$0	89.4%	7.9	9.30%	$17,009.40
ECM #10	NEMA Premium Motors Return Fans	$7,420	$4,560	$0	$11,980	$749	$0	$749	18	$13,482	$0	12.5%	16.0	1.27%	($1,678.62)
ECM #11	Automatic Boiler Blowdown Controls	$4,000	$3,700	$0	$7,700	$418	$0	$418	15	$6,270	$0	-18.6%	18.4	-2%	($2,709.94)

Notes:

1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

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SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives from July 1, 2013 to June 30, 2014:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Cooling

Gas Absorption Chillers	$185 - $450 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $92 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

Closed Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps ≥ 20 hp	$60 per VFD rated hp
Rotary Screw Air Compressors ≥ 25 hp	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot (For fixtures ≥ 150w)	$25 per fixture
HID ≥ 100w Replace with new induction fixture. (must be 30% less watts/fixture than HID system)	$70 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Stairwell and Passageway Luminaires	$40 per fixture
LED Bollard Fixtures	$50 per fixture
Luminaires for Ambient Lighting of Interior Commercial Spaces (1x4, 2x2, 2x4)	$50 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$10 per lamp for R/PAR20,MR/PAR16,Globe,Candelabra or Misc $20 per lamp for R/BR/PAR 30, R/BR/PAR 38-40, A-Lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted (Existing Facilities Only)	$20 per control
Remote Mounted (Existing Facilities Only)	$35 per control
Daylight Dimming Controls	$45 per fixture controlled
Occupancy Based hi-low Dimming Control	$35 per fixture controlled
Occupancy Sensor Remote Mounted	$35 per control

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and an IRR of at least 10%.

APPENDIX C

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

Justice Complex

Primary Property Function: Prison/Incarceration
Gross Floor Area (ft²): 163,600
Built: 1985

For Year Ending: December 31, 2013
Date Generated: May 08, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Justice Complex 120 Hooper Avenue Toms River, New Jersey 08753	Ocean County 239 Washington Street Building #5 Toms River, NJ 08753 (____)____-_____	Joseph Meyers 239 Washington Street Building #5 Toms River, NJ 08753 732-929-2039 JosephMeyers@co.ocean.nj.us

Property ID: 4046969

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
202.3 kBtu/ft²

Source EUI
392.3 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	14,082,328 (42%)
Natural Gas (kBtu)	19,016,284 (58%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	87.6
National Median Source EUI (kBtu/ft²)	169.9
% Diff from National Median Source EUI	131%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	2,792

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Split System Units

Tag	19-CU-5		
Unit Type	Condensing Unit		
Qty	1		
Location	Roof Behind West A		
Area Served	AHU-5		
Manufacturer	Carrier		
Model #	38AE014600		
Serial #	P395281		
Cooling Type	DX (R22)		
Cooling Capacity (Tons)	11.50		
Cooling Efficiency (SEER/EER)	10 EER		
Heating Type	N/A		
Heating Input (MBH)	N/A		
Efficiency	N/A		
Fuel	N/A		
Approx Age	27		
ASHRAE Service Life	15		
Remaining Life	(12)		
Comments	460/3P		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

AHUs

Tag	AHU-1	AHU-2	AHU-3
Unit Type	Central Air Handling Unit	Central Air Handling Unit	Central Air Handling Unit
Qty	1	1	1
Location	Mechanical Room	Mechanical Room	Mechanical Room
Area Served	-	-	-
Manufacturer	Carrier	Carrier	Carrier
Model #	39ED57	39ED39	39ED57
Serial #	0783D 07283	0883T 07284	0783D 07288
Cooling Type	Chilled Water Coil	Chilled Water Coil	Chilled Water Coil
Cooling Capacity	"-"	"-"	"-"
Air Delivery (CFM)	28450	19500	28450
Heating Type	Hot Water Coil	Hot Water Coil	Hot Water Coil
Heating Input	-	-	-
Supply Fan (HP)	-	-	-
Return Fan (HP)	-	-	-
Approx Age	32	32	32
ASHRAE Service Life	20	20	20
Remaining Life	(12)	(12)	(12)
Comments	RF-1 15 HP Motor 87.5 % Eff.	RF-2 10 HP Motor 84.0 % Eff.	RF-3 15 HP Motor 87.5 % Eff.

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	AHU-4	AHU-6	AHU-7
Unit Type	Central Air Handling Unit	Central Air Handling Unit	Split Air Handling Unit
Qty	1	1	1
Location	Mechanical Room	Mechanical Room	Mechanical
Area Served	-	Atrium	Rms B25, B23, B24, B26, B28
Manufacturer	Carrier	Carrier	Trane
Model #	39ED39	"-"	CSIA012
Serial #	0883T 07285	"-"	"-"
Cooling Type	Chilled Water Coil	Chilled Water Coil	DX Coil
Cooling Capacity	"-"	"-"	15-Tons
Air Delivery (CFM)	19500	-	4750
Heating Type	Hot Water Coil	Hot Water Coil	Hot Water Coil
Heating Input	-	-	217 MBH
Supply Fan (HP)	-	-	7.5 HP
Return Fan (HP)	-	-	N/A
Approx Age	32	32	2
ASHRAE Service Life	20	20	20
Remaining Life	(12)	(12)	18
Comments	RF-4 10 HP Motor 84.0% Eff.		Trane Model TTA180E Outdoor Condensing Unit

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	19-SC-3	19-SC-2	19-SC-1
Unit Type	RTU	RTU	RTU
Qty	1	1	1
Location	85 Roof	85 Roof	85 Roof
Area Served	Dorms	Dorms	Dorms
Manufacturer	Trane	Trane	Trane
Model #	TCD480B40K8B2KE200C000H0K	TCD480B40K6BB2KE200C000H0K	TCD480B40K6B2KE200C
Serial #	C12J063BB	C12J06389	C12J06387
Cooling Type	DX	DX	DX
Cooling Capacity	40.0	40.0	40.0
Air Delivery (CFM)	-	-	-
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input	-	-	-
Supply Fan (HP)	N/A	N/A	N/A
Return Fan (HP)	10.00	10.00	10.00
Approx Age	2	2	2
ASHRAE Service Life	15	15	15
Remaining Life	13	13	13
Comments	x2 EF 1.5 HP	x2 EF 1.5 HP	x2 EF 1.5 HP

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	19-SC-7	19-SC-6	AHU-5
Unit Type	RTU	RTU	Indoor Unit
Qty	1	1	1
Location	85 Roof	85 Roof	3rd Floor Mech '85 Jail
Area Served	Classroom Area	Indoor Gym	3rd Floor Jail Partial
Manufacturer	Govern Air	Govern Air	Carrier
Model #	TL20-1016-E	TL-20-1016-E	39BA060D15
Serial #	28834	28833	830614849
Cooling Type	DX	DX	DX
Cooling Capacity	20.0	20.0	12.0
Air Delivery (CFM)	-	-	
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input	-	-	-
Supply Fan (HP)	N/A	N/A	N/A
Return Fan (HP)	5.00	5.00	3.00
Approx Age	20	20	30
ASHRAE Service Life	15	15	20
Remaining Life	(5)	(5)	(10)
Comments			Pneumatic Control Panel JCI

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Boilers

Tag	B-1	B-2
Unit Type	Steam Fire-Tube Boiler	Steam Fire-Tube Boiler
Qty	1	1
Location	Boiler Room	Boiler Room
Area Served	Entire Facility	Entire Facility
Manufacturer	Cleaver-Brooks	Cleaver-Brooks
Model #	CB200-500	CB200-500
Serial #	L-75802	L-75803
Input Capacity	20,922 MBH	20,922 MBH
Rated Output Capacity	16,700 MBH	16,700 MBH
Approx. Efficiency %	70% (Existing Condition)	70% (Existing Condition)
Fuel	Natural Gas	Natural Gas
Approx Age	32	32
ASHRAE Service Life	25	25
Remaining Life	(7)	(7)
Comments	Marathon 15 HP Blower Motor 90.2% Eff. Air Compressor Motor Marathon 5 HP 85.5% Eff.	Marathon 15 HP Blower Motor 90.2% Eff. Air Compressor Motor Marathon 5 HP 85.5% Eff.

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Pumps

Tag	P-1	P-2	P-3	P-4
Unit Type	Base Mounted End Suction Pump	Base Mounted End Suction Pump	Base Mounted End Suction Pump	Base Mounted End Suction Pump
Qty	1	1	1	1
Location	Mechanical Room	Mechanical Room	Mechanical Room	Mechanical Room
Area Served	Chilled Water System	Chilled Water System	Condenser Water System	Condenser Water System
Manufacturer	Bell & Gossett	Bell & Gossett	Bell & Gossett	Bell & Gossett
Size	-	-	1510 5E 9.875 BF	1510 5E 9.875 BF
Horse Power	30.0	30.0	30	30
Flow	840 GPM	840 GPM	1,050 GPM @ 70' TDH	1,050 GPM @ 70' TDH
Motor Info	Lincoln	Lincoln	Lincoln Electric	Lincoln Electric
Electrical Power	230/460	230/460	230/460	230/460
RPM	1755	1755	1755	1755
Motor Efficiency	87.5%	87.5%	88.5%	88.5%
Approx Age	15	15	15	15
ASHRAE Service Life	20	20	20	20
Remaining Life	5	5	5	5
Comments			Honeywell VFD	Honeywell VFD

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Chiller

Tag	CH-1		
Unit Type	Water-Cooled Centrifugal Electric		
Qty	1		
Location	Central Plant		
Area Served	Entire Facility		
Manufacturer	Carrier		
Model #	19DK7873CL		
Serial #	82-52 33738		
Refrigerant	R11		
Cooling Capacity (Tons)	350 Tons		
Cooling Efficiency (KW/Ton)	15.6 EER		
Volts / Phase / Hz	208/3/60		
Fuel	Electric		
Chilled Water GPM / ΔT	840 GPM @ 10°F ΔT		
Condenser Water GPM / ΔT	1050 GPM @ 10°F ΔT		
Approx Age	32		
ASHRAE Service Life	25		
Remaining Life	(7)		
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Cooling Tower

Tag	CT-1
Unit Type	
Qty	1
Location	Outside Mechanical Room
Area Served	Condenser Water
Manufacturer	Marley NC Class
Model #	NC8304G1GS
Serial #	NC-243937-A1
Heat Rejection	Nominal 362 Tons
Rated Flow GPM	3 GPM/Ton = 1,086 GPM
EWT / LWT	95°F/85°F/78°F WB
Fan (s) Motor HP	25 HP
Electrical	230/460
Approx Age	10
ASHRAE Service Life	20
Remaining Life	10
Comments	

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Transformers

Tag	XFMR	XFMR	
Unit Type	Dry Type	Dry Type	
Qty	1	1	
Location	3rd Flr '85 Jail	3rd Flr '85 Jail	
Manufacturer	GE	GE	
Catalog #	9T23B3875	9T25H3871	
Serial #	-	-	
Rating (kVA)	45.0	15.0	
Electrical (V/H/P)	208/120/60/3	208/120/60/3	
Impedance (%)	4.0%	5.1%	
Approx Age	20	20	
ASHRAE Service Life	25	25	
Remaining Life	5	5	
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group
JUSTICE COMPLEX

Kitchen

Tag				
Unit Type	Kettle Pots	Double Rack Convection Oven	Combo Range/Oven	Combo Griddle oven
Qty	2	2	1	1
Location	Kitchen	Kitchen	Kitchen	Kitchen
Manufacturer	Vulcan	Vulcan	Vulcan	Garland
Model #	GL80E-126	VC4G0-64	-	-
Serial #	46-2004343	18-1618631	-	-
Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Comments			10 burner range, combo double oven	

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Kitchen

Rack Oven	Dishwasher
1	1
Kitchen	Kitchen
Vulcan	Insinger
-	-
-	-
Natural Gas	Electric
	Conveyor Type with 36kW electric booster

MAJOR EQUIPMENT LIST

Concord Engineering Group

JUSTICE COMPLEX

Washing/Drying

Tag			
Unit Type	Commercial Washing Machine	Electric Commercial Dryer	Electric Commercial Dryer
Qty	4	1	1
Location	Wash/Dryer Room	Wash/Dryer Room	Wash/Dryer Room
Manufacturer	Alliance	Wascomat	Cissell
Model #	SC80VNVQ-U400 V1	ADE120ES	No Tag
Serial #	M0899152321	547863	No Tag
Comments	80lb washing machine	75.6 kW	60 kW

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

APPENDIX E

CEG Project #: 1C14065
Facility Name: Justice Complex (Non-Jail)
Address: 120 Hooper Avenue
City, State, Zip Toms River, NJ 08753

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
	1st Floor																																
11	181 Temp Security Entrance	4000	3-Lamp T8 2x4 Recessed Prismatic Lens	3	93	2	0.19	744	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	440	0.08	304	$33	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	13.46	$0.00	$0.00	$0.00	FALSE	-
26	181 Temp Security Entrance	4000	1-Lamp CFL Recessed Can Clear Lens	1	18	6	0.11	432	Existing to Remain	No Change	1	18	0	0.11	432	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	$20.00	-
1	11 Court RM	3000	3-Lamp T8 2x2 Recessed Prismatic Lens	3	53	5	0.27	795	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	690	0.04	105	$12	0	No New Controls	0	0.0%	0	$0	$725.00	$325.00	$1,050.00	$250.00	69.26	$0.00	$0.00	$0.00	FALSE	-
36	11 Court RM	3000	1-Lamp T8 4' Pendant Parabolic Lens	1	32	18	0.58	1,728	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	18	0.50	1,512	0.07	216	$24	0	No New Controls	0	0.0%	0	$0	$2,520.00	$1,170.00	$3,690.00	$900.00	117.42	$0.00	$0.00	$0.00	FALSE	-
37	11 Court RM	3000	1-Lamp T8 4' Recessed Parabolic Lens	1	32	12	0.38	1,152	Replace Fixture	1x4 LED Recessed 2500 lumen 25w Cooper #14AC-LD3-25-UNV-L840-CD1-U	1	25	12	0.30	900	0.08	252	$28	0	No New Controls	0	0.0%	0	$0	$1,620.00	$780.00	$2,400.00	$600.00	64.94	$0.00	$0.00	$0.00	FALSE	-
1	131 Jury RM	3000	3-Lamp T8 2x2 Recessed Prismatic Lens	3	53	6	0.32	954	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.04	126	$14	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$18	$870.00	$390.00	$1,260.00	$300.00	69.26	$200.00	$50.00	$250.00	FALSE	13.72
41	131 Jury - Restroom	1200	1-Lamp T12 4' Surface Mount Prismatic Lens	1	46	1	0.05	55	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	34	0.02	22	$2	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	7	$1	$140.00	$65.00	$205.00	$0.00	86.28	$50.00	$50.00	$100.00	FALSE	135.28
4	131 Jury - Hallway	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	2	0.14	576	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	368	0.05	208	$23	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-
41	124 Women's Restroom	4000	1-Lamp T12 4' Surface Mount Prismatic Lens	1	46	1	0.05	184	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	112	0.02	72	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	22	$2	$140.00	$65.00	$205.00	$0.00	25.88	$50.00	$50.00	$100.00	FALSE	40.58
38	123 Men's Restroom	4000	2-Lamp T8 4' Surface Mount Prismatic Lens	2	62	1	0.06	248	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	192	0.01	56	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	38	$4	$130.00	$65.00	$195.00	$50.00	23.54	$50.00	$50.00	$100.00	FALSE	23.67
17	121 Copy RM	3000	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	2	0.25	762	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.14	432	$48	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$0.00	11.57	$50.00	$50.00	$100.00	$20.00	11.02
14	128 Office	3000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	2	0.23	684	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	2	0.14	432	0.08	252	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$10	$420.00	$130.00	$550.00	$100.00	16.23	$50.00	$50.00	$100.00	FALSE	10.52
6	128 Office	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	186	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.02	48	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	0	20.0%	28	$3	$145.00	$65.00	$210.00	$50.00	30.30	$0.00	$0.00	$0.00	FALSE	0.00
30	128 Office	3000	1-Lamp CFL Surface Wall Mount	1	18	1	0.02	54	Existing to Remain	No Change	1	18	0	0.02	54	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
14	11 Judges Chambers	3000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	1	0.11	342	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	1	0.07	216	0.04	126	$14	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	16.23	$0.00	$0.00	$0.00	FALSE	-
21	11 Judges Chambers	3000	8-Lamp T8 4x4 Recessed Prismatic Lens	8	228	1	0.23	684	Re-Lamp & Bypass Ballast	LED 4' 18w LED Tube	8	144	1	0.14	432	0.08	252	$28	0	No New Controls	0	0.0%	0	$0	$320.00	$65.00	$385.00	$0.00	13.89	$0.00	$0.00	$0.00	FALSE	-
42	11 Judges Chambers - Bathroom	4000	1-Lamp T12 4' Surface Wall Mount	1	46	1	0.05	184	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	112	0.02	72	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	22	$2	$140.00	$65.00	$205.00	$0.00	25.88	$50.00	$50.00	$100.00	FALSE	40.58
30	11 Judges Chambers - Closet	2000	1-Lamp CFL Surface Wall Mount	1	18	1	0.02	36	Existing to Remain	No Change	1	18	0	0.02	36	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
6	11 Court RM - Hallway	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	7	0.43	1,736	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	1,288	0.11	448	$49	0	No New Controls	0	0.0%	0	$0	$1,015.00	$455.00	$1,470.00	$350.00	22.73	$0.00	$0.00	$0.00	-	-
39	12 Court RM	3000	2-Lamp T8 4' Recessed Parabolic Lens	2	62	12	0.74	2,232	Replace Fixture	1x4 Recessed LED 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	12	0.46	1,368	0.29	864	$95	0	No New Controls	0	0.0%	0	$0	$1,620.00	$780.00	$2,400.00	$600.00	18.94	$0.00	$0.00	$0.00	FALSE	-
36	12 Court RM	3000	1-Lamp T8 4' Pendant Parabolic Lens	1	32	24	0.77	2,304	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	24	0.67	2,016	0.10	288	$32	0	No New Controls	0	0.0%	0	$0	$3,360.00	$1,560.00	$4,920.00	$1,200.00	117.42	$0.00	$0.00	$0.00	FALSE	-
19	112 Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	6	1.06	3,168	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.73	2,178	$240	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	198	$22	$1,050.00	$390.00	$1,440.00	$0.00	6.01	$200.00	$50.00	$250.00	$35.00	9.87
14	117 Office	3000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	2	0.23	684	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	2	0.14	432	0.08	252	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$10	$420.00	$130.00	$550.00	$100.00	16.23	$50.00	$50.00	$100.00	$20.00	8.42
6	118 Office	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	186	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.02	48	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	28	$3	$145.00	$65.00	$210.00	$50.00	30.30	$50.00	$50.00	$100.00	FALSE	32.94

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
14	Judge Office	3000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	1	0.11	342	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	1	0.07	216	0.04	126	$14	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	16.23	$0.00	$0.00	$0.00	FALSE	-
21	Judge Office	3000	8-Lamp T8 4x4 Recessed Prismatic Lens	8	228	1	0.23	684	Re-Lamp & Bypass Ballast	LED 4' 18w LED Tube	8	144	1	0.14	432	0.08	252	$28	0	No New Controls	0	0.0%	0	$0	$320.00	$65.00	$385.00	$0.00	13.89	$0.00	$0.00	$0.00	FALSE	-
6	Judge Office	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	30.30	$0.00	$0.00	$0.00	FALSE	-
44	Men's Bathroom By Lobby	4000	2-Lamp T12 4' Recessed Prismatic Lens	2	88	4	0.35	1,408	Replace Fixture	1x4 Recessed LED 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	4	0.15	608	0.20	800	$88	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	122	$13	$540.00	$260.00	$800.00	$0.00	9.09	$200.00	$50.00	$250.00	FALSE	18.69
14	Judge Marquis Jones RM	4000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	7	0.80	3,192	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	7	0.50	2,016	0.29	1,176	$129	0	No New Controls	0	0.0%	0	$0	$1,470.00	$455.00	$1,925.00	$350.00	12.18	$0.00	$0.00	$0.00	FALSE	-
26	108A Office	3000	1-Lamp CFL Recessed Can Clear Lens	1	18	14	0.25	756	Existing to Remain	No Change	1	18	0	0.25	756	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
6	Hallway	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	496	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	368	0.03	128	$14	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	22.73	$0.00	$0.00	$0.00	FALSE	-
19	106 Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	4	0.70	2,112	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.48	1,452	$160	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	132	$15	$700.00	$260.00	$960.00	$0.00	6.01	$200.00	$50.00	$250.00	$35.00	14.81
22	106 Office	3000	8-Lamp T12 4x4 Recessed Opaque Lens	8	352	1	0.35	1,056	Re-Lamp & Bypass Ballast	LED 4' 18w LED Tube	8	144	1	0.14	432	0.21	624	$69	5	Dual Technology Occupancy Sensor - Remote Mnt.	0	20.0%	86	$10	$320.00	$65.00	$385.00	$0.00	5.61	$0.00	$0.00	$0.00	FALSE	0.00
22	Courtroom By Office 106	3000	8-Lamp T12 4x4 Recessed Opaque Lens	8	352	6	2.11	6,336	Re-Lamp & Bypass Ballast	LED 4' 18w LED Tube	8	144	6	0.86	2,592	1.25	3,744	$412	0	No New Controls	0	0.0%	0	$0	$1,920.00	$390.00	$2,310.00	$0.00	5.61	$0.00	$0.00	$0.00	FALSE	-
46	Courtroom By Office 106	3000	1-Lamp T8 4' Cove Lighting No Lens	1	32	12	0.38	1,152	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	12	0.34	1,008	0.05	144	$16	0	No New Controls	0	0.0%	0	$0	$1,680.00	$780.00	$2,460.00	$600.00	117.42	$0.00	$0.00	$0.00	FALSE	-
46	Courtroom By Office 106	3000	1-Lamp T8 4' Cove Lighting No Lens	1	32	6	0.19	576	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	6	0.17	504	0.02	72	$8	0	No New Controls	0	0.0%	0	$0	$840.00	$390.00	$1,230.00	$300.00	117.42	$0.00	$0.00	$0.00	FALSE	-
46	Courtroom By Office 106	3000	1-Lamp T8 4' Cove Lighting No Lens	1	32	12	0.38	1,152	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	12	0.34	1,008	0.05	144	$16	0	No New Controls	0	0.0%	0	$0	$1,680.00	$780.00	$2,460.00	$600.00	117.42	$0.00	$0.00	$0.00	FALSE	-
19	104 Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	6	1.06	3,168	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.73	2,178	$240	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	198	$22	$1,050.00	$390.00	$1,440.00	$0.00	6.01	$200.00	$50.00	$250.00	$35.00	9.87
19	102 Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	2	0.35	1,056	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.24	726	$80	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$350.00	$130.00	$480.00	$0.00	6.01	$50.00	$50.00	$100.00	$20.00	11.02
26	Judge Office	3000	1-Lamp CFL Recessed Can Clear Lens	1	18	14	0.25	756	Existing to Remain	No Change	1	18	0	0.25	756	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
50	Judge Office - Bathroom	1200	1-Lamp T12 2' Surface Wall Mount Prismatic Lens	1	36	1	0.04	43	Replace Fixture	2' LED Strip 2300 lumen 23w Cooper #2SNLED-LD1-23-LC-UNV-840-CD1-U	1	23	1	0.02	28	0.01	16	$2	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	6	$1	$120.00	$65.00	$185.00	$0.00	107.81	$50.00	$50.00	$100.00	FALSE	164.69
4	Office Hallway	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	3	0.22	864	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	552	0.08	312	$34	0	No New Controls	0	0.0%	0	$0	$435.00	$195.00	$630.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-
18	107 Office	3000	3-Lamp T12 2x4 Recessed Opaque Lens	3	127	2	0.25	762	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.14	432	$48	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$0.00	11.57	$50.00	$50.00	$100.00	$20.00	11.02
7	105 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	14	0.87	2,604	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	14	0.64	1,932	0.22	672	$74	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	386	$43	$2,030.00	$910.00	$2,940.00	$700.00	30.30	$400.00	$100.00	$500.00	$35.00	10.94
18	107A Office	3000	3-Lamp T12 2x4 Recessed Opaque Lens	3	127	1	0.13	381	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.07	216	$24	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	33	$4	$210.00	$65.00	$275.00	$0.00	11.57	$50.00	$50.00	$100.00	FALSE	27.55
49	Bathroom By 107A	4000	1-Lamp T8 2' Surface Wall Mount Prismatic Lens	1	22	1	0.02	88	Replace Fixture	2' LED Strip 2300 lumen 23w Cooper #2SNLED-LD1-23-LC-UNV-840-CD1-U	1	23	1	0.02	92	(0.00)	(4)	($0)	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	18	$2	$120.00	$65.00	$185.00	$0.00	(420.45)	$50.00	$50.00	$100.00	FALSE	49.41
19	102A Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	4	0.70	2,112	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.48	1,452	$160	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$15	$700.00	$260.00	$960.00	$0.00	6.01	$50.00	$50.00	$100.00	$20.00	5.51
19	102B Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	4	0.70	2,112	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.48	1,452	$160	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$15	$700.00	$260.00	$960.00	$0.00	6.01	$50.00	$50.00	$100.00	$20.00	5.51
4	Hallway Near 103A	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	11	0.79	3,168	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	11	0.51	2,024	0.29	1,144	$126	0	No New Controls	0	0.0%	0	$0	$1,595.00	$715.00	$2,310.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
19	103 Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	1	0.18	528	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.12	363	$40	0	No New Controls	0	0.0%	0	$0	$175.00	$65.00	$240.00	$0.00	6.01	$0.00	$0.00	$0.00	FALSE	-
19	100A Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	6	1.06	3,168	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.73	2,178	$240	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	198	$22	$1,050.00	$390.00	$1,440.00	$0.00	6.01	$200.00	$50.00	$250.00	$35.00	9.87
19	100B Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	1	0.18	528	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.12	363	$40	0	No New Controls	0	0.0%	0	$0	$175.00	$65.00	$240.00	$0.00	6.01	$0.00	$0.00	$0.00	FALSE	-
28	100 Judge Office	3000	1-Lamp Incandescent Recessed Can Clear Lens	1	60	16	0.96	2,880	Re-Lamp	Philips A19 LED Lamp 8w	1	8	16	0.13	384	0.83	2,496	$275	0	No New Controls	0	0.0%	0	$0	$320.00	$260.00	$580.00	$320.00	0.95	$0.00	$0.00	$0.00	FALSE	-
4	Hallway Near 101C	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	4	0.29	1,152	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	736	0.10	416	$46	0	No New Controls	0	0.0%	0	$0	$580.00	$260.00	$840.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-
19	101C Office	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	1	0.18	528	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.12	363	$40	0	No New Controls	0	0.0%	0	$0	$175.00	$65.00	$240.00	$0.00	6.01	$0.00	$0.00	$0.00	FALSE	-
18	101A Office	3000	3-Lamp T12 2x4 Recessed Opaque Lens	3	127	1	0.13	381	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.07	216	$24	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$0.00	11.57	$0.00	$0.00	$0.00	FALSE	-
18	101D Office	3000	3-Lamp T12 2x4 Recessed Opaque Lens	3	127	1	0.13	381	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.07	216	$24	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$0.00	11.57	$0.00	$0.00	$0.00	FALSE	-
6	Office Near 101D	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	186	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.02	48	$5	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	30.30	$0.00	$0.00	$0.00	FALSE	-
22	Courtroom By 101-154	3000	8-Lamp T12 4x4 Recessed Opaque Lens	8	352	6	2.11	6,336	Re-Lamp & Bypass Ballast	LED 4' 18w LED Tube	8	144	6	0.86	2,592	1.25	3,744	$412	0	No New Controls	0	0.0%	0	$0	$1,920.00	$390.00	$2,310.00	$0.00	5.61	$0.00	$0.00	$0.00	FALSE	-
26	Courtroom By 101-154	3000	1-Lamp CFL Recessed Can Clear Lens	1	18	6	0.11	324	Existing to Remain	No Change	1	18	0	0.11	324	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
6	154 H9	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$16	0	No New Controls	0	0.0%	0	$0	$435.00	$195.00	$630.00	$150.00	30.30	$0.00	$0.00	$0.00	FALSE	-
7	151 Judge Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$48	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	30.30	$0.00	$0.00	$0.00	FALSE	-
7	151 Judge Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$32	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	30.30	$0.00	$0.00	$0.00	FALSE	-
30	Closet Wall	2000	1-Lamp CFL Surface Wall Mount	1	18	1	0.02	36	Existing to Remain	No Change	1	18	0	0.02	36	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
37	Court RM 16	3000	1-Lamp T8 4' Recessed Parabolic Lens	1	32	12	0.38	1,152	Replace Fixture	1x4 LED Recessed 2500 lumen 25w Cooper #14AC-LD3-25-UNV-L840-CD1-U	1	25	12	0.30	900	0.08	252	$28	0	No New Controls	0	0.0%	0	$0	$1,620.00	$780.00	$2,400.00	$600.00	64.94	$0.00	$0.00	$0.00	FALSE	-
6	Court RM 16	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	24	1.49	4,464	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	24	1.10	3,312	0.38	1,152	$127	0	No New Controls	0	0.0%	0	$0	$3,480.00	$1,560.00	$5,040.00	$1,200.00	30.30	$0.00	$0.00	$0.00	FALSE	-
6	Hallway by Courtroom 16	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	7	0.43	1,736	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	1,288	0.11	448	$49	0	No New Controls	0	0.0%	0	$0	$1,015.00	$455.00	$1,470.00	$350.00	22.73	$0.00	$0.00	$0.00	FALSE	-
42	153 Men's Restroom	4000	1-Lamp T12 4' Surface Wall Mount	1	46	1	0.05	184	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	112	0.02	72	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	22	$2	$140.00	$65.00	$205.00	$0.00	25.88	$50.00	$50.00	$100.00	FALSE	40.58
7	147 Copy RM	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$100.00	30.30	$50.00	$50.00	$100.00	FALSE	16.47
6	146 Elevator Hallway	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	496	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	368	0.03	128	$14	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	22.73	$0.00	$0.00	$0.00	FALSE	-
7	143 Judge Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$48	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	30.30	$0.00	$0.00	$0.00	FALSE	-
6	143 Judge Office - Hallway	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	496	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	368	0.03	128	$14	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	22.73	$0.00	$0.00	$0.00	FALSE	-
30	143 Judge Office - Closet	2000	1-Lamp CFL Surface Wall Mount	1	18	1	0.02	36	Existing to Remain	No Change	1	18	0	0.02	36	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
47	144 Bathroom	4000	1-Lamp T8 4' Surface Wall Mount Prismatic Lens	1	32	1	0.03	128	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	112	0.00	16	$2	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	22	$2	$140.00	$65.00	$205.00	$5.00	113.64	$50.00	$50.00	$100.00	FALSE	40.58

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
7	141 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$100.00	30.30	$50.00	$50.00	$100.00	FALSE	16.47
30	141 Office - Closet	2000	1-Lamp CFL Surface Wall Mount	1	18	1	0.02	36	Existing to Remain	No Change	1	18	0	0.02	36	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
6	17 Court RM	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	24	1.49	4,464	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	24	1.10	3,312	0.38	1,152	$127	0	No New Controls	0	0.0%	0	$0	$3,480.00	$1,560.00	$5,040.00	$1,200.00	30.30	$0.00	$0.00	$0.00	FALSE	-
39	17 Court RM	3000	2-Lamp T8 4' Recessed Parabolic Lens	2	62	12	0.74	2,232	Replace Fixture	1x4 Recessed LED 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	12	0.46	1,368	0.29	864	$95	0	No New Controls	0	0.0%	0	$0	$1,620.00	$780.00	$2,400.00	$600.00	18.94	$0.00	$0.00	$0.00	FALSE	-
	2nd Floor												0																					
6	Secuirity Entrance by RM 214	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	4	0.25	992	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	736	0.06	256	$28	0	No New Controls	0	0.0%	0	$0	$580.00	$260.00	$840.00	$200.00	22.73	$0.00	$0.00	$0.00	FALSE	-
6	Secuirity Entrance by RM 214 - Hallway	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	13	0.81	3,224	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	13	0.60	2,392	0.21	832	$92	0	No New Controls	0	0.0%	0	$0	$1,885.00	$845.00	$2,730.00	$650.00	22.73	$0.00	$0.00	$0.00	FALSE	-
14	Secuirity Center by RM 214	4000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	2	0.23	912	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	2	0.14	576	0.08	336	$37	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	12.18	$0.00	$0.00	$0.00	FALSE	-
7	214 Admin. RM	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	23	1.43	4,278	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	23	1.06	3,174	0.37	1,104	$121	0	No New Controls	0	0.0%	0	$0	$3,335.00	$1,495.00	$4,830.00	$1,150.00	30.30	$0.00	$0.00	$0.00	FALSE	-
19	210 Family Division	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	15	2.64	7,920	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	15	0.83	2,475	1.82	5,445	$599	0	No New Controls	0	0.0%	0	$0	$2,625.00	$975.00	$3,600.00	$0.00	6.01	$0.00	$0.00	$0.00	FALSE	-
4	210 Family Division	3000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	1	0.07	216	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.03	78	$9	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$0.00	24.48	$0.00	$0.00	$0.00	FALSE	-
19	210 Family Division - File Storage	2600	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	8	1.41	3,661	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	8	0.44	1,144	0.97	2,517	$277	0	No New Controls	0	0.0%	0	$0	$1,400.00	$520.00	$1,920.00	$0.00	6.94	$0.00	$0.00	$0.00	FALSE	-
7	209 Family Division Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	24	1.49	4,464	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	24	1.10	3,312	0.38	1,152	$127	0	No New Controls	0	0.0%	0	$0	$3,480.00	$1,560.00	$5,040.00	$1,200.00	30.30	$0.00	$0.00	$0.00	FALSE	-
4	209 Family Division Office - Office 1	3000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	2	0.14	432	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.05	156	$17	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$0.00	24.48	$50.00	$50.00	$100.00	FALSE	16.47
44	209 Family Division Office - Storage	2600	2-Lamp T12 4' Recessed Prismatic Lens	2	88	1	0.09	229	Replace Fixture	1x4 Recessed LED 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	1	0.04	99	0.05	130	$14	0	No New Controls	0	0.0%	0	$0	$135.00	$65.00	$200.00	$0.00	13.99	$0.00	$0.00	$0.00	FALSE	-
7	209 Family Division Office - Office 2	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$100.00	30.30	$50.00	$50.00	$100.00	FALSE	16.47
7	209 Family Division Office - Office 3	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$100.00	30.30	$50.00	$50.00	$100.00	FALSE	16.47
6	209 Family Division Office - Office 4	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	4	0.25	744	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	552	0.06	192	$21	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	110	$12	$580.00	$260.00	$840.00	$200.00	30.30	$50.00	$50.00	$100.00	$20.00	6.59
14	209 Family Division Office - Office 5	3000	4-Lamp T8 2x4 Recessed Prismatic Lens	4	114	9	1.03	3,078	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	9	0.65	1,944	0.38	1,134	$125	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	389	$43	$1,890.00	$585.00	$2,475.00	$450.00	16.23	$50.00	$50.00	$100.00	$20.00	1.87
17	201 File Storage	2600	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	2	0.25	660	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.14	374	$41	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$0.00	13.35	$0.00	$0.00	$0.00	FALSE	-
12	Finance & Purchasing	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	6	0.56	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.23	684	$75	0	No New Controls	0	0.0%	0	$0	$1,260.00	$390.00	$1,650.00	$300.00	17.94	$0.00	$0.00	$0.00	FALSE	-
44	Finance & Purchasing	3000	2-Lamp T12 4' Recessed Prismatic Lens	2	88	4	0.35	1,056	Replace Fixture	1x4 Recessed LED 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	4	0.15	456	0.20	600	$66	0	No New Controls	0	0.0%	0	$0	$540.00	$260.00	$800.00	$0.00	12.12	$0.00	$0.00	$0.00	FALSE	-
12	Finance & Purchasing Copy RM	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	1	0.09	279	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.04	114	$13	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	17.94	$0.00	$0.00	$0.00	FALSE	-
12	Finance & Purchasing Office 1	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$25	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$100.00	17.94	$50.00	$50.00	$100.00	$20.00	11.02
12	Finance & Purchasing Office 2	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$25	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$100.00	17.94	$50.00	$50.00	$100.00	$20.00	11.02
7	Finance & Purchasing Office 3	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	83	$9	$435.00	$195.00	$630.00	$150.00	30.30	$50.00	$50.00	$100.00	$20.00	8.78

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
7	Finance & Purchasing Office 4	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$100.00	30.30	$50.00	$50.00	$100.00	FALSE	16.47
12	234 Office	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	6	0.56	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.23	684	$75	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	198	$22	$1,260.00	$390.00	$1,650.00	$300.00	17.94	$200.00	$50.00	$250.00	$35.00	9.87
12	235 Office	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	4	0.37	1,116	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.15	456	$50	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$15	$840.00	$260.00	$1,100.00	$200.00	17.94	$50.00	$50.00	$100.00	$20.00	5.51
12	240 Administrator	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	12	1.12	3,348	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	12	0.66	1,980	0.46	1,368	$150	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	396	$44	$2,520.00	$780.00	$3,300.00	$600.00	17.94	$400.00	$100.00	$500.00	$35.00	10.67
12	237 Office	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	4	0.37	1,116	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.15	456	$50	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$15	$840.00	$260.00	$1,100.00	$200.00	17.94	$50.00	$50.00	$100.00	$20.00	5.51
12	239 Office	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$25	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$100.00	17.94	$50.00	$50.00	$100.00	$20.00	11.02
12	Office 1 - Across from RM 240	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	6	0.56	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.23	684	$75	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	198	$22	$1,260.00	$390.00	$1,650.00	$300.00	17.94	$200.00	$50.00	$250.00	$35.00	9.87
7	Office 2 - Across from RM 240	800	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	446	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	331	0.14	115	$13	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	66	$7	$1,305.00	$585.00	$1,890.00	$450.00	113.64	$200.00	$50.00	$250.00	$35.00	29.51
7	Office 3 - Across from RM 240	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	744	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	552	0.06	192	$21	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	110	$12	$580.00	$260.00	$840.00	$200.00	30.30	$50.00	$50.00	$100.00	$20.00	6.59
7	Office 4 - Across from RM 240	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	744	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	552	0.06	192	$21	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	110	$12	$580.00	$260.00	$840.00	$200.00	30.30	$50.00	$50.00	$100.00	$20.00	6.59
7	Office 5 - Across from RM 240	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	744	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	552	0.06	192	$21	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	110	$12	$580.00	$260.00	$840.00	$200.00	30.30	$50.00	$50.00	$100.00	$20.00	6.59
19	247 Break RM	3000	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	3	0.53	1,584	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	495	0.36	1,089	$120	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	99	$11	$525.00	$195.00	$720.00	$0.00	6.01	$200.00	$50.00	$250.00	FALSE	22.96
4	Hallway Outside 240	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	7	0.50	2,016	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	1,288	0.18	728	$80	0	No New Controls	0	0.0%	0	$0	$1,015.00	$455.00	$1,470.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-
7	221 Admin RM	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	39	2.42	7,254	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	39	1.79	5,382	0.62	1,872	$206	0	No New Controls	0	0.0%	0	$0	$5,655.00	$2,535.00	$8,190.00	$1,950.00	30.30	$0.00	$0.00	$0.00	FALSE	-
7	221 Admin - Break RM	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$16	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	83	$9	$435.00	$195.00	$630.00	$150.00	30.30	$200.00	$50.00	$250.00	FALSE	27.45
7	221 Admin - Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	83	$9	$435.00	$195.00	$630.00	$150.00	30.30	$50.00	$50.00	$100.00	$20.00	8.78
7	223 Storage File RM	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	5	0.31	806	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	598	0.08	208	$23	0	No New Controls	0	0.0%	0	$0	$725.00	$325.00	$1,050.00	$250.00	34.97	$0.00	$0.00	$0.00	FALSE	-
7	221 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$42	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	221	$24	$1,160.00	$520.00	$1,680.00	$400.00	30.30	$200.00	$50.00	$250.00	$35.00	8.85
12	220 Admin RM	3000	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	20	1.86	5,580	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	20	1.10	3,300	0.76	2,280	$251	0	No New Controls	0	0.0%	0	$0	$4,200.00	$1,300.00	$5,500.00	$1,000.00	17.94	$0.00	$0.00	$0.00	FALSE	-
12	220 Admin - File Storage RM	2600	3-Lamp T8 2x4 Recessed Parabolic Lens	3	93	9	0.84	2,176	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	9	0.50	1,287	0.34	889	$98	0	No New Controls	0	0.0%	0	$0	$1,890.00	$585.00	$2,475.00	$450.00	20.70	$0.00	$0.00	$0.00	FALSE	-
40	220 Admin - Closet	2000	2-Lamp T8 4' Recessed Prismatic Lnes	2	62	1	0.06	124	Replace Fixture	1x4 Recessed LED 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	1	0.04	76	0.02	48	$5	0	No New Controls	0	0.0%	0	$0	$135.00	$65.00	$200.00	$50.00	28.41	$0.00	$0.00	$0.00	FALSE	-
17	220 Admin - Office 1	3000	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	2	0.25	762	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.14	432	$48	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$0.00	11.57	$50.00	$50.00	$100.00	$20.00	11.02
17	220 Admin - Office 2	3000	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	2	0.25	762	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.14	432	$48	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$0.00	11.57	$50.00	$50.00	$100.00	$20.00	11.02
	3rd Floor												0																					
7	Sherrif Reception	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$48	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	30.30	$0.00	$0.00	$0.00	FALSE	-
7	320 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$32	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$18	$870.00	$390.00	$1,260.00	$300.00	30.30	$200.00	$50.00	$250.00	$35.00	11.80

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
7	318 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$48	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$27	$1,305.00	$585.00	$1,890.00	$450.00	30.30	$200.00	$50.00	$250.00	$35.00	7.87
7	Office Hallway	4000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	2,232	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,656	0.14	576	$63	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	22.73	$0.00	$0.00	$0.00	FALSE	-
7	315 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$32	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$18	$870.00	$390.00	$1,260.00	$300.00	30.30	$200.00	$50.00	$250.00	$35.00	11.80
7	316 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	55	$6	$290.00	$130.00	$420.00	$100.00	30.30	$50.00	$50.00	$100.00	FALSE	16.47
7	314 Office	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$32	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$18	$870.00	$390.00	$1,260.00	$300.00	30.30	$200.00	$50.00	$250.00	$35.00	11.80
17	313 File Storage	2600	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	4	0.51	1,321	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	572	0.29	749	$82	0	No New Controls	0	0.0%	0	$0	$840.00	$260.00	$1,100.00	$0.00	13.35	$0.00	$0.00	$0.00	FALSE	-
17	Administrator - Next to 313 & 314	3000	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	16	2.03	6,096	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	16	0.88	2,640	1.15	3,456	$380	0	No New Controls	0	0.0%	0	$0	$3,360.00	$1,040.00	$4,400.00	$0.00	11.57	$0.00	$0.00	$0.00	FALSE	-
17	311 Office 1	3000	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	2	0.25	762	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.14	432	$48	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$0.00	11.57	$50.00	$50.00	$100.00	$20.00	11.02
17	311 Office 2	3000	3-Lamp T12 2x4 Recessed Prismatic Lens	3	127	2	0.25	762	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.14	432	$48	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$7	$420.00	$130.00	$550.00	$0.00	11.57	$50.00	$50.00	$100.00	$20.00	11.02
7	Office Area	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	28	1.74	5,208	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	28	1.29	3,864	0.45	1,344	$148	0	No New Controls	0	0.0%	0	$0	$4,060.00	$1,820.00	$5,880.00	$1,400.00	30.30	$0.00	$0.00	$0.00	FALSE	-
4	Hallway By 302	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	7	0.50	2,016	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	1,288	0.18	728	$80	0	No New Controls	0	0.0%	0	$0	$1,015.00	$455.00	$1,470.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-
6	302 Kitchen	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	5	0.31	930	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	690	0.08	240	$26	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	138	$15	$725.00	$325.00	$1,050.00	$250.00	30.30	$200.00	$50.00	$250.00	$35.00	14.16
4	Hallway by Elevator	4000	2-Lamp T12-U 2x2 Recessed Prismatic Lens	2	72	11	0.79	3,168	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	11	0.51	2,024	0.29	1,144	$126	0	No New Controls	0	0.0%	0	$0	$1,595.00	$715.00	$2,310.00	$0.00	18.36	$0.00	$0.00	$0.00	FALSE	-
43	Walkway to Parking Garage	4000	1-Lamp T12 4' Pendant Prismatic Lens	1	46	23	1.06	4,232	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	23	0.64	2,576	0.41	1,656	$182	0	No New Controls	0	0.0%	0	$0	$3,220.00	$1,495.00	$4,715.00	$0.00	25.88	$0.00	$0.00	$0.00	FALSE	-
45	Walkway to Parking Garage	4000	2-Lamp T12 4' Surface Mount Prismatic Lens	2	88	1	0.09	352	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	192	0.04	160	$18	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$0.00	11.08	$0.00	$0.00	$0.00	FALSE	-
43	Walkway to Parking Garage	4000	1-Lamp T12 4' Pendant Prismatic Lens	1	46	37	1.70	6,808	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	37	1.04	4,144	0.67	2,664	$293	0	No New Controls	0	0.0%	0	$0	$5,180.00	$2,405.00	$7,585.00	$0.00	25.88	$0.00	$0.00	$0.00	FALSE	-
33	Walkway to Parking Garage	4000	2-Lamp CFL Surface Mount	2	36	11	0.40	1,584	Existing to Remain	No Change	2	36	0	0.40	1,584	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
43	Walkway to Parking Garage	4000	1-Lamp T12 4' Pendant Prismatic Lens	1	46	8	0.37	1,472	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	8	0.22	896	0.14	576	$63	0	No New Controls	0	0.0%	0	$0	$1,120.00	$520.00	$1,640.00	$0.00	25.88	$0.00	$0.00	$0.00	FALSE	-
9	1.1 - 1st Floor Main Lobby	4000	3-Lamp T8-U 2x2 Recessed Prismatic Lens	3	92	1	0.09	368	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	184	0.05	184	$20	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	7.91	$0.00	$0.00	$0.00	FALSE	-
26	1.1 - 1st Floor Main Lobby	4000	1-Lamp CFL Recessed Can Clear Lens	1	18	2	0.04	144	Existing to Remain	No Change	1	18	0	0.04	144	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
9	1.2 - Hallway	4000	3-Lamp T8-U 2x2 Recessed Prismatic Lens	3	92	9	0.83	3,312	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,656	0.41	1,656	$182	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	7.91	$0.00	$0.00	$0.00	FALSE	-
26	1.2 - Hallway	4000	1-Lamp CFL Recessed Can Clear Lens	1	18	26	0.47	1,872	Existing to Remain	No Change	1	18	0	0.47	1,872	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
26	1.3 - 1st Floor Main Lobby	4000	1-Lamp CFL Recessed Can Clear Lens	1	18	3	0.05	216	Existing to Remain	No Change	1	18	0	0.05	216	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
15	1.3 - 1st Floor Main Lobby	4000	4-Lamp T8 2x4 Surface Mount Prismatic Lens	4	114	6	0.68	2,736	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,320	0.35	1,416	$156	0	No New Controls	0	0.0%	0	$0	$1,050.00	$390.00	$1,440.00	$300.00	7.32	$0.00	$0.00	$0.00	FALSE	-
47	1.3 - 1st Floor Main Lobby	4000	1-Lamp T8 4' Surface Wall Mount Prismatic Lens	1	32	1	0.03	128	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	112	0.00	16	$2	0	No New Controls	0	0.0%	0	$0	$140.00	$65.00	$205.00	$5.00	113.64	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
38	1.3 - 1st Floor Main Lobby	4000	2-Lamp T8 4' Surface Mount Prismatic Lens	2	62	5	0.31	1,240	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	5	0.24	960	0.07	280	$31	0	No New Controls	0	0.0%	0	$0	$650.00	$325.00	$975.00	$250.00	23.54	$0.00	$0.00	$0.00	FALSE	-
38	1.2 - Hallway	4000	2-Lamp T8 4' Surface Mount Prismatic Lens	2	62	2	0.12	496	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	384	0.03	112	$12	0	No New Controls	0	0.0%	0	$0	$260.00	$130.00	$390.00	$100.00	23.54	$0.00	$0.00	$0.00	FALSE	-
34	1.4 - Main Entrance in Construction	1000	4-Lamp CFL Pendant Decorative Fixture	4	72	6	0.43	432	Existing to Remain	No Change	4	72	0	0.43	432	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
31	1.4 - Main Entrance in Construction	1000	1-Lamp CFL Surface Wall Mount - Broken	1	0	10	0.00	0	Existing to Remain	No Change	1	0	0	0.00	0	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
26	1.2 - Hallway	4000	1-Lamp CFL Recessed Can Clear Lens	1	18	3	0.05	216	Existing to Remain	No Change	1	18	0	0.05	216	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
26	Elevators	4000	1-Lamp CFL Recessed Can Clear Lens	1	18	12	0.22	864	Existing to Remain	No Change	1	18	0	0.22	864	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
48	216 - Closet	2000	2-Lamp T8 4' Surface Mount Parablic Lens	2	62	1	0.06	124	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	96	0.01	28	$3	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$50.00	47.08	$0.00	$0.00	$0.00	FALSE	-
													0																					
38	New Gerbal - Walkway Between Justice and Court House	4000	2-Lamp T8 4' Surface Mount Prismatic Lens	2	62	17	1.05	4,216	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	17	0.82	3,264	0.24	952	$105	0	No New Controls	0	0.0%	0	$0	$2,210.00	$1,105.00	$3,315.00	$850.00	23.54	$0.00	$0.00	$0.00	FALSE	-
47	New Gerbal - Walkway Between Justice and Court House	4000	1-Lamp T8 4' Surface Wall Mount Prismatic Lens	1	32	22	0.70	2,816	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	22	0.62	2,464	0.09	352	$39	0	No New Controls	0	0.0%	0	$0	$3,080.00	$1,430.00	$4,510.00	$110.00	113.64	$0.00	$0.00	$0.00	FALSE	-
53	Stairwell by Crossover to Parking Garage	3000	2-Lamp T8 4' Surface Wall Mount Prismatic Lens	2	62	6	0.37	1,116	Replace Fixture	4' LED Strip 4900 lumen 49w Cooper #SNLED-LD1-49-LC-UNV-L840-CD1-U	1	49	6	0.29	882	0.08	234	$26	0	No New Controls	0	0.0%	0	$0	$1,050.00	$390.00	$1,440.00	$300.00	44.29	$0.00	$0.00	$0.00	FALSE	-
6	Stairwell by Crossover to Parking Garage	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	186	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.02	48	$5	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	30.30	$0.00	$0.00	$0.00	FALSE	-
52	2nd Floor Elec Closet	2000	2-Lamp T8 4' Pendant No Lens	2	62	3	0.19	372	Replace Fixture	4' LED Strip 4900 lumen 49w Cooper #SNLED-LD1-49-LC-UNV-L840-CD1-U	1	49	3	0.15	294	0.04	78	$9	0	No New Controls	0	0.0%	0	$0	$525.00	$195.00	$720.00	$150.00	66.43	$0.00	$0.00	$0.00	FALSE	-
6	2nd Floor Hallway Outside 214 to 209	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	16	0.99	3,968	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	16	0.74	2,944	0.26	1,024	$113	0	No New Controls	0	0.0%	0	$0	$2,320.00	$1,040.00	$3,360.00	$800.00	22.73	$0.00	$0.00	$0.00	FALSE	-
6	Lobby Outside 209	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	15	0.93	3,720	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	15	0.69	2,760	0.24	960	$106	0	No New Controls	0	0.0%	0	$0	$2,175.00	$975.00	$3,150.00	$750.00	22.73	$0.00	$0.00	$0.00	FALSE	-
53	Stairwell by 220	3000	2-Lamp T8 4' Surface Wall Mount Prismatic Lens	2	62	7	0.43	1,302	Replace Fixture	4' LED Strip 4900 lumen 49w Cooper #SNLED-LD1-49-LC-UNV-L840-CD1-U	1	49	7	0.34	1,029	0.09	273	$30	0	No New Controls	0	0.0%	0	$0	$1,225.00	$455.00	$1,680.00	$350.00	44.29	$0.00	$0.00	$0.00	FALSE	-
6	Hallway by 209 to 240	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	2,232	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,656	0.14	576	$63	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	22.73	$0.00	$0.00	$0.00	FALSE	-
53	Stairwell by 240	3000	2-Lamp T8 4' Surface Wall Mount Prismatic Lens	2	62	4	0.25	744	Replace Fixture	4' LED Strip 4900 lumen 49w Cooper #SNLED-LD1-49-LC-UNV-L840-CD1-U	1	49	4	0.20	588	0.05	156	$17	0	No New Controls	0	0.0%	0	$0	$700.00	$260.00	$960.00	$200.00	44.29	$0.00	$0.00	$0.00	FALSE	-
6	Hallway Outside Elevator	4000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	2,232	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,656	0.14	576	$63	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	22.73	$0.00	$0.00	$0.00	FALSE	-
55	Exterior	4000	1-Lamp Exterior Recessed Cans Prismatic Lens	1	92	45	4.14	16,560	Re-lamp & Bypass Ballast	LED Retrofit Lamp (Non-DLC) Neptun 35w Par56	1	36	45	1.62	6,480	2.52	10,080	$1,109	0	No New Controls	0	0.0%	0	$0	$9,450.00	$4,500.00	$13,950.00	$0.00	12.58	$0.00	$0.00	$0.00	FALSE	-
56	Exterior	4000	1-Lamp Exterior MH Wall Mount Clear Lens	1	92	4	0.37	1,472	Re-lamp & Bypass Ballast	LED Retrofit Lamp (Non-DLC) Neptun 35w Par56	1	36	4	0.14	576	0.22	896	$99	0	No New Controls	0	0.0%	0	$0	$840.00	$400.00	$1,240.00	$0.00	12.58	$0.00	$0.00	$0.00	FALSE	-
57	Exterior	4000	1-Lamp Exterior MH Ceiling Mount	1	92	1	0.09	368	Re-lamp & Bypass Ballast	LED Retrofit Lamp (Non-DLC) Neptun 35w Par56	1	36	1	0.04	144	0.06	224	$25	0	No New Controls	0	0.0%	0	$0	$210.00	$100.00	$310.00	$0.00	12.58	$0.00	$0.00	$0.00	FALSE	-
58	Exterior	4000	2-Lamp Exterior MH Post Top Clear Lens	2	184	3	0.55	2,208	Re-lamp & Bypass Ballast	LED Retrofit Lamp (Non-DLC) Maxlite 36w LED Mogul Base	2	72	3	0.22	864	0.34	1,344	$148	0	No New Controls	0	0.0%	0	$0	$1,170.00	$300.00	$1,470.00	$0.00	9.94	$0.00	$0.00	$0.00	FALSE	-
59	Exterior	4000	1-Lamp Exterior MH Post Top Clear Lens	1	92	1	0.09	368	Re-lamp & Bypass Ballast	LED Retrofit Lamp (Non-DLC) Maxlite 36w LED Mogul Base	1	36	1	0.04	144	0.06	224	$25	0	No New Controls	0	0.0%	0	$0	$195.00	$100.00	$295.00	$0.00	11.97	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					**1,155**	**82**	**266,957**					**1,037**	**49**	**160,000**	**33**	**106,957**	**$11,765**			**61**		**6,620**	**$728**	**$164,665**	**$68,515**	**$233,180**	**$35,340**	**16.815657**	**$6,200**	**$3,050**	**$9,250**	**$985.00**	**$11.35**

CEG Project #: 1C14065
Facility Name: Justice Complex ('85 Jail)
Address: 120 Hooper Avenue
City, State, Zip Toms River, NJ 08753

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
4th Floor																																	
142.21	Capt's Office	2600	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	4	0.59	1,539	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	4	72	4	0.29	749	0.30	790	$87	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	150	$16	$480.00	$360.00	$840.00	$0.00	9.66	$50.00	$50.00	$100.00	$20.00	4.86
121.41	Office Restroom	2600	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	1	0.07	187	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	1	0.05	130	0.02	57	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	26	$3	$250.00	$100.00	$350.00	$0.00	55.63	$50.00	$50.00	$100.00	FALSE	34.97
121.41	Attic Stairs	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	3	0.22	259	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	3	0.15	180	0.07	79	$9	0	No New Controls	0	0.0%	0	$0	$750.00	$300.00	$1,050.00	$0.00	120.52	$0.00	$0.00	$0.00	FALSE	-
121.34	Elev Mech Room	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mount, No Lens	2	72	6	0.43	518	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	259	0.22	259	$29	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$0.00	25.25	$0.00	$0.00	$0.00	FALSE	-
121.41	Elev Lobby	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	2	0.14	1,261	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	2	0.10	876	0.04	385	$42	0	No New Controls	0	0.0%	0	$0	$500.00	$200.00	$700.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
East - 5 PODS																																	
121.41	Corridor - East Side	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	24	1.73	15,137	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	24	1.20	10,512	0.53	4,625	$509	0	No New Controls	0	0.0%	0	$0	$6,000.00	$2,400.00	$8,400.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
2	East - Large Pods (3)	5840	2', 2 Lamp, T12, Secure	2	50	48	2.40	14,016	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	48	1.06	6,167	1.34	7,849	$863	0	No New Controls	0	0.0%	0	$0	$2,880.00	$4,800.00	$7,680.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-
618		5840	26w CFL	1	26	3	0.08	456	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	3	0.04	219	0.04	237	$26	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$60.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	45	6.66	38,894	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	4	72	45	3.24	18,922	3.42	19,973	$2,197	0	No New Controls	0	0.0%	0	$0	$5,400.00	$4,050.00	$9,450.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
2	East - Small Pods (2)	5840	2', 2 Lamp, T12, Secure	2	50	16	0.80	4,672	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	16	0.35	2,056	0.45	2,616	$288	0	No New Controls	0	0.0%	0	$0	$960.00	$1,600.00	$2,560.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-
618		5840	26w CFL	1	26	2	0.05	304	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	2	0.03	146	0.03	158	$17	0	No New Controls	0	0.0%	0	$0	$40.00	$40.00	$80.00	$40.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	30	4.44	25,930	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	4	72	30	2.16	12,614	2.28	13,315	$1,465	0	No New Controls	0	0.0%	0	$0	$3,600.00	$2,700.00	$6,300.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
121.21	Control Room	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$75	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
121.14	Storage	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, No Lens	2	72	1	0.07	86	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	43	0.04	43	$5	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	25.25	$0.00	$0.00	$0.00	FALSE	-
121.14	Elec Room	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, No Lens	2	72	1	0.07	86	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	43	0.04	43	$5	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	25.25	$0.00	$0.00	$0.00	FALSE	-
North - 4 PODS																																	
2	North - Small Pods (4)	5840	2', 2 Lamp, T12, Secure	2	50	32	1.60	9,344	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	32	0.70	4,111	0.90	5,233	$576	0	No New Controls	0	0.0%	0	$0	$1,920.00	$3,200.00	$5,120.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-
618		5840	26w CFL	1	26	4	0.10	607	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	4	0.05	292	0.05	315	$35	0	No New Controls	0	0.0%	0	$0	$80.00	$80.00	$160.00	$80.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	60	8.88	51,859	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	4	72	60	4.32	25,229	4.56	26,630	$2,929	0	No New Controls	0	0.0%	0	$0	$7,200.00	$5,400.00	$12,600.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
121.14	Mop Closet	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, No Lens	2	72	1	0.07	86	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	43	0.04	43	$5	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	25.25	$0.00	$0.00	$0.00	FALSE	-
700	Rec Yard 1	4400	400w HPS Flood	1	465	2	0.93	4,092	Replace Fixture	RAB 93w LED Flood	1	93	2	0.19	818	0.74	3,274	$360	0	No New Controls	0	0.0%	0	$0	$400.00	$300.00	$700.00	$100.00	1.67	$0.00	$0.00	$0.00	FALSE	-
700	Rec Yard 2&3	4400	400w HPS Flood	1	465	2	0.93	4,092	Replace Fixture	RAB 93w LED Flood	1	93	2	0.19	818	0.74	3,274	$360	0	No New Controls	0	0.0%	0	$0	$400.00	$300.00	$700.00	$100.00	1.67	$0.00	$0.00	$0.00	FALSE	-
121.41	Rec Office	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	1	0.07	631	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	1	0.05	438	0.02	193	$21	0	No New Controls	0	0.0%	0	$0	$250.00	$100.00	$350.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
121.41	Corridor - North	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	16	1.15	10,092	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	16	0.80	7,008	0.35	3,084	$339	0	No New Controls	0	0.0%	0	$0	$4,000.00	$1,600.00	$5,600.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
121.21	Control Room	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$50	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
South - 3 PODS																																	
2	South - Large Pods (1)	5840	2', 2 Lamp, T12, Secure	2	50	16	0.80	4,672	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	16	0.35	2,056	0.45	2,616	$288	0	No New Controls	0	0.0%	0	$0	$960.00	$1,600.00	$2,560.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-
618		5840	26w CFL	1	26	1	0.03	152	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	1	0.01	73	0.01	79	$9	0	No New Controls	0	0.0%	0	$0	$20.00	$20.00	$40.00	$20.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	15	2.22	12,965	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	4	72	15	1.08	6,307	1.14	6,658	$732	0	No New Controls	0	0.0%	0	$0	$1,800.00	$1,350.00	$3,150.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
2		5840	2', 2 Lamp, T12, Secure	2	50	16	0.80	4,672	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	16	0.35	2,056	0.45	2,616	$288	0	No New Controls	0	0.0%	0	$0	$960.00	$1,600.00	$2,560.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
618	South - Small Pods (2)	5840	26w CFL	1	26	2	0.05	304	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	2	0.03	146	0.03	158	$17	0	No New Controls	0	0.0%	0	$0	$40.00	$40.00	$80.00	$40.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	30	4.44	25,930	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	30	2.16	12,614	2.28	13,315	$1,465	0	No New Controls	0	0.0%	0	$0	$3,600.00	$2,700.00	$6,300.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
121.41	Corridor - South	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	6	0.43	3,784	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	6	0.30	2,628	0.13	1,156	$127	0	No New Controls	0	0.0%	0	$0	$1,500.00	$600.00	$2,100.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
127.21	Video Court Vestibule	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	1	0.08	683	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	272	0.05	412	$45	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
142.21	Video Court Vestibule	8760	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	1	0.15	1,296	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	1	0.07	631	0.08	666	$73	0	No New Controls	0	0.0%	0	$0	$120.00	$90.00	$210.00	$0.00	2.87	$0.00	$0.00	$0.00	FALSE	-
142.21	Video Court Hallway	8760	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	4	0.59	5,186	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	4	0.29	2,523	0.30	2,663	$293	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	2.87	$0.00	$0.00	$0.00	FALSE	-
127.21	Video Court Hallway	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	1	0.08	683	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	272	0.05	412	$45	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
142.21	Classroom	8760	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	20	2.96	25,930	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	20	1.44	12,614	1.52	13,315	$1,465	0	No New Controls	0	0.0%	0	$0	$2,400.00	$1,800.00	$4,200.00	$0.00	2.87	$0.00	$0.00	$0.00	FALSE	-
142.21	Classroom Office	2600	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	1	0.15	385	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	1	0.07	187	0.08	198	$22	0	No New Controls	0	0.0%	0	$0	$120.00	$90.00	$210.00	$0.00	9.66	$0.00	$0.00	$0.00	FALSE	-
142.21	Classroom	8760	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	20	2.96	25,930	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	20	1.44	12,614	1.52	13,315	$1,465	0	No New Controls	0	0.0%	0	$0	$2,400.00	$1,800.00	$4,200.00	$0.00	2.87	$0.00	$0.00	$0.00	FALSE	-
142.21	Video Court Hallway	8760	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	4	0.59	5,186	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	4	0.29	2,523	0.30	2,663	$293	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	2.87	$0.00	$0.00	$0.00	FALSE	-
127.21	Video Court Hallway	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	1	0.08	683	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	272	0.05	412	$45	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
142.21	Classroom Office	2600	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	1	0.15	385	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	1	0.07	187	0.08	198	$22	0	No New Controls	0	0.0%	0	$0	$120.00	$90.00	$210.00	$0.00	9.66	$0.00	$0.00	$0.00	FALSE	-
127.21	Video Court Vestibule	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	1	0.08	683	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	272	0.05	412	$45	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
142.21	Video Court Vestibule	8760	2x4, 4 Lamp, 34w T12, Mag. Ballast, Recessed Mount, Prismatic Lens - Secure	4	148	2	0.30	2,593	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	2	0.14	1,261	0.15	1,332	$146	0	No New Controls	0	0.0%	0	$0	$240.00	$180.00	$420.00	$0.00	2.87	$0.00	$0.00	$0.00	FALSE	-
West - 5 PODS																																		
121.41	Corridor - West	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	24	1.73	15,137	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	24	1.20	10,512	0.53	4,625	$509	0	No New Controls	0	0.0%	0	$0	$6,000.00	$2,400.00	$8,400.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
2		5840	2', 2 Lamp, T12, Secure	2	50	48	2.40	14,016	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	48	1.06	6,167	1.34	7,849	$863	0	No New Controls	0	0.0%	0	$0	$2,880.00	$4,800.00	$7,680.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-
618	West - Large Pods (3)	5840	26w CFL	1	26	3	0.08	456	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	3	0.04	219	0.04	237	$26	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$60.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	45	6.66	38,894	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	45	3.24	18,922	3.42	19,973	$2,197	0	No New Controls	0	0.0%	0	$0	$5,400.00	$4,050.00	$9,450.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
2		5840	2', 2 Lamp, T12, Secure	2	50	16	0.80	4,672	Bypass Ballast, Relamp	11w LED Retrofit Lamp	2	22	16	0.35	2,056	0.45	2,616	$288	0	No New Controls	0	0.0%	0	$0	$960.00	$1,600.00	$2,560.00	$0.00	8.90	$0.00	$0.00	$0.00	FALSE	-
618	West - Small Pods (2)	5840	26w CFL	1	26	2	0.05	304	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	2	0.03	146	0.03	158	$17	0	No New Controls	0	0.0%	0	$0	$40.00	$40.00	$80.00	$40.00	2.31	$0.00	$0.00	$0.00	FALSE	-
141.11		5840	1x4, 4-Lamp, 34w T12, Mag. Ballast, Surface Mount, Prismatic Lens - Secure	4	148	30	4.44	25,930	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	4	72	30	2.16	12,614	2.28	13,315	$1,465	0	No New Controls	0	0.0%	0	$0	$3,600.00	$2,700.00	$6,300.00	$0.00	4.30	$0.00	$0.00	$0.00	FALSE	-
121.41	Break Through (Hall)	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Wall Mount, Prismatic Lens	2	72	4	0.29	2,523	Replace Fixture	50w LED Corner Mount; Kenall 50L40K	1	50	4	0.20	1,752	0.09	771	$85	0	No New Controls	0	0.0%	0	$0	$1,000.00	$400.00	$1,400.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
Basement																																		
121.21	Laundry	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	9	0.56	4,888	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	9	0.32	2,838	0.23	2,050	$225	0	No New Controls	0	0.0%	0	$0	$540.00	$540.00	$1,080.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
227.21	Corridors	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	28	1.74	15,207	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	28	0.87	7,604	0.87	7,604	$836	0	No New Controls	0	0.0%	0	$0	$3,360.00	$1,120.00	$4,480.00	$1,400.00	3.68	$0.00	$0.00	$0.00	FALSE	-
121.21	Office - Services Director	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	6	0.37	3,259	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	6	0.22	1,892	0.16	1,367	$150	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	378	$42	$360.00	$360.00	$720.00	$0.00	4.79	$50.00	$50.00	$100.00	$20.00	1.92
121.21	Lunch Room	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	14	0.87	7,604	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	14	0.50	4,415	0.36	3,189	$351	0	No New Controls	0	0.0%	0	$0	$840.00	$840.00	$1,680.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
121.21	Kitchen	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	38	2.36	20,639	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	38	1.37	11,984	0.99	8,655	$952	0	No New Controls	0	0.0%	0	$0	$2,280.00	$2,280.00	$4,560.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
617	Kit. Hood	8760	100w A19 Incandescent Lamp	1	100	10	1.00	8,760	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	10	0.13	1,095	0.88	7,665	$843	0	No New Controls	0	0.0%	0	$0	$200.00	$200.00	$400.00	$200.00	0.24	$0.00	$0.00	$0.00	FALSE	-
132.21	Wash Area	8760	2x4, 3 Lamp, 34w T12, Elect. Ballast, Recessed Mnt., Prismatic Lens, Secure	3	94	6	0.56	4,941	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	3	56	6	0.34	2,943	0.23	1,997	$220	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	3.82	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
121.21	Kit. Office	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$25	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	63	$7	$60.00	$60.00	$120.00	$0.00	4.79	$50.00	$50.00	$100.00	FALSE	14.41
121.21	Kit Storage	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$200	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
612	Walkin	8760	100w A19 Incandescent Lamp	1	100	2	0.20	1,752	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	1	12.5	2	0.03	219	0.18	1,533	$169	0	No New Controls	0	0.0%	0	$0	$40.00	$40.00	$80.00	$40.00	0.24	$0.00	$0.00	$0.00	FALSE	-
121.21	Walkin/Receiving	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	10	0.62	5,431	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	10	0.36	3,154	0.26	2,278	$251	0	No New Controls	0	0.0%	0	$0	$600.00	$600.00	$1,200.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
121.11	Dry Storage 2	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens - Secure	2	72	1	0.07	631	Replace Fixture	50w LED Ceiling Mount; Kenall 50L40K	1	50	1	0.05	438	0.02	193	$21	0	No New Controls	0	0.0%	0	$0	$250.00	$100.00	$350.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
121.11	Dry Storage 1	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens - Secure	2	72	1	0.07	631	Replace Fixture	50w LED Ceiling Mount; Kenall 50L40K	1	50	1	0.05	438	0.02	193	$21	0	No New Controls	0	0.0%	0	$0	$250.00	$100.00	$350.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
121.14	Garbage Can Storage	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, No Lens	2	72	2	0.14	1,261	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.07	631	$69	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	3.46	$0.00	$0.00	$0.00	FALSE	-
132.21	Garbage Can Storage	8760	2x4, 3 Lamp, 34w T12, Elect. Ballast, Recessed Mnt., Prismatic Lens, Secure	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$73	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.82	$0.00	$0.00	$0.00	FALSE	-
121.21	Holding Cell 2	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$75	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
121.21	Holding Cell 3	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	6	0.37	3,259	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	6	0.22	1,892	0.16	1,367	$150	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$0.00	4.79	$0.00	$0.00	$0.00	FALSE	-
121.34	Elev Mech Room	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mount, No Lens	2	72	2	0.14	173	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	2	0.07	86	0.07	86	$10	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	17	$2	$120.00	$120.00	$240.00	$0.00	25.25	$50.00	$50.00	$100.00	FALSE	52.61
121.34	L Room	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mount, No Lens	2	72	7	0.50	4,415	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.25	2,208	$243	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	3.46	$0.00	$0.00	$0.00	FALSE	-
127.21	East Court Elevator Vestibule	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	2	0.16	1,367	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	2	0.06	543	0.09	823	$91	0	No New Controls	0	0.0%	0	$0	$240.00	$80.00	$320.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
127.21	Officers Office	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	2	0.16	1,367	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	2	0.06	543	0.09	823	$91	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	109	$12	$240.00	$80.00	$320.00	$0.00	3.53	$50.00	$50.00	$100.00	FALSE	8.37
121.21	Officers Office	8760	1x4, 2 Lamp, 34w T12, Recessed Mount, Max. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$200	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	505	$56	$480.00	$480.00	$960.00	$0.00	4.79	$50.00	$50.00	$100.00	$20.00	1.44
121.34	Storage 179	1200	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mount, No Lens	2	72	3	0.22	259	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	2	36	3	0.11	130	0.11	130	$14	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	26	$3	$180.00	$180.00	$360.00	$0.00	25.25	$50.00	$50.00	$100.00	$20.00	28.06
127.21	West Court Elev Vestibule	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	2	0.16	1,367	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	2	0.06	543	0.09	823	$91	0	No New Controls	0	0.0%	0	$0	$240.00	$80.00	$320.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
121.11	Corridor to New Jail	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens - Secure	2	72	8	0.58	5,046	Replace Fixture	50w LED Ceiling Mount; Kenall 50L40K	1	50	8	0.40	3,504	0.18	1,542	$170	0	No New Controls	0	0.0%	0	$0	$2,000.00	$800.00	$2,800.00	$0.00	16.51	$0.00	$0.00	$0.00	FALSE	-
232.21	Corridor to New Jail	8760	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	3,294	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	3	56	4	0.22	1,962	0.15	1,332	$146	0	No New Controls	0	0.0%	0	$0	$320.00	$240.00	$560.00	$0.00	3.82	$0.00	$0.00	$0.00	FALSE	-
127.21	Corridor - Outside Security	8760	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	12	0.94	8,199	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	12	0.37	3,259	0.56	4,941	$543	0	No New Controls	0	0.0%	0	$0	$1,440.00	$480.00	$1,920.00	$0.00	3.53	$0.00	$0.00	$0.00	FALSE	-
127.21	Storage	1200	2x2, 2 Lamp, 32w U T12, Elect. Ballast, Recessed Mnt., Parabolic Lens - Secure	2	78	1	0.08	94	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	37	0.05	56	$6	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$0.00	25.79	$0.00	$0.00	$0.00	FALSE	-
132.21	storage	1200	2x4, 3 Lamp, 34w T12, Elect. Ballast, Recessed Mnt., Prismatic Lens, Secure	3	94	2	0.19	226	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	3	56	2	0.11	134	0.08	91	$10	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	27.91	$0.00	$0.00	$0.00	FALSE	-
132.21	Staff Developement Center	8760	2x4, 3 Lamp, 34w T12, Elect. Ballast, Recessed Mnt., Prismatic Lens, Secure	3	94	9	0.85	7,411	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	3	56	9	0.50	4,415	0.34	2,996	$330	0	No New Controls	0	0.0%	0	$0	$720.00	$540.00	$1,260.00	$0.00	3.82	$0.00	$0.00	$0.00	FALSE	-
132.21	B12	8760	2x4, 3 Lamp, 34w T12, Elect. Ballast, Recessed Mnt., Prismatic Lens, Secure	3	94	9	0.85	7,411	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-TB-Y-SW-120-Z-S-N	3	56	9	0.50	4,415	0.34	2,996	$330	0	No New Controls	0	0.0%	0	$0	$720.00	$540.00	$1,260.00	$0.00	3.82	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					**842**	**81**	**542,296**					**842**	**40**	**273,757**	**40.7**	**268,540**	**$29,539**			**8**		**1,274**	**140**	**$89,630**	**$69,380**	**$159,010**	**$2,180**	**5.31**	**$400**	**$400**	**$800**	**$80.00**	**5.14**

OCEAN COUNTY

NEW JAIL

118 HOOPER AVENUE
TOMS RIVER, NJ 08753

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	General Service Secondary 3-Phase
Third Party Supplier:	Hess

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	General Service Large (GSL)
Third Party Supplier:	Hess

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: JCP&L
Rate: General Service Secondary 3-Phase
Meter No: L013649433
Account No: 10-00-76-2401-65
Third Party Utility Provider: Hess
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Mar-13	200,400	496.6	$23,502
Apr-13	185,440	417.5	$21,475
May-13	230,994	548.9	$26,938
Jun-13	245,059	535.8	$29,156
Jul-13	321,916	600.2	$37,580
Aug-13	247,246	501.8	$29,147
Sep-13	242,134	542.7	$28,645
Oct-13	229,762	453.9	$26,807
Nov-13	186,915	349.2	$21,680
Dec-13	206,210	326.2	$23,536
Jan-14	179,968	303.8	$20,410
Feb-14	181,407	318.2	$20,432
Totals	**2,657,451**	**600.2 Max**	**$309,308**

AVERAGE DEMAND **449.6 KW average**
AVERAGE RATE **$0.116** **$/kWh**

Figure 1
Electricity Usage Profile

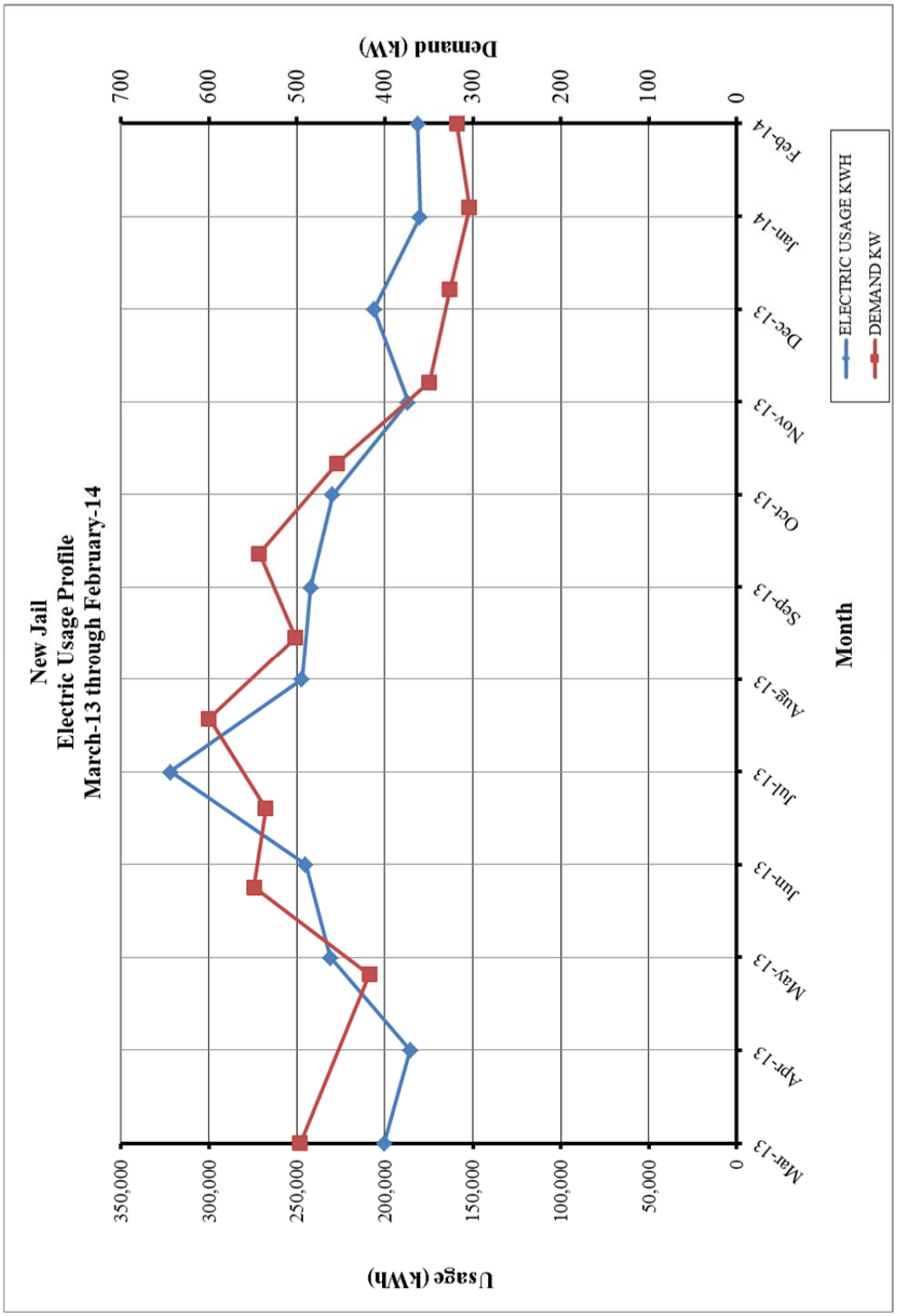
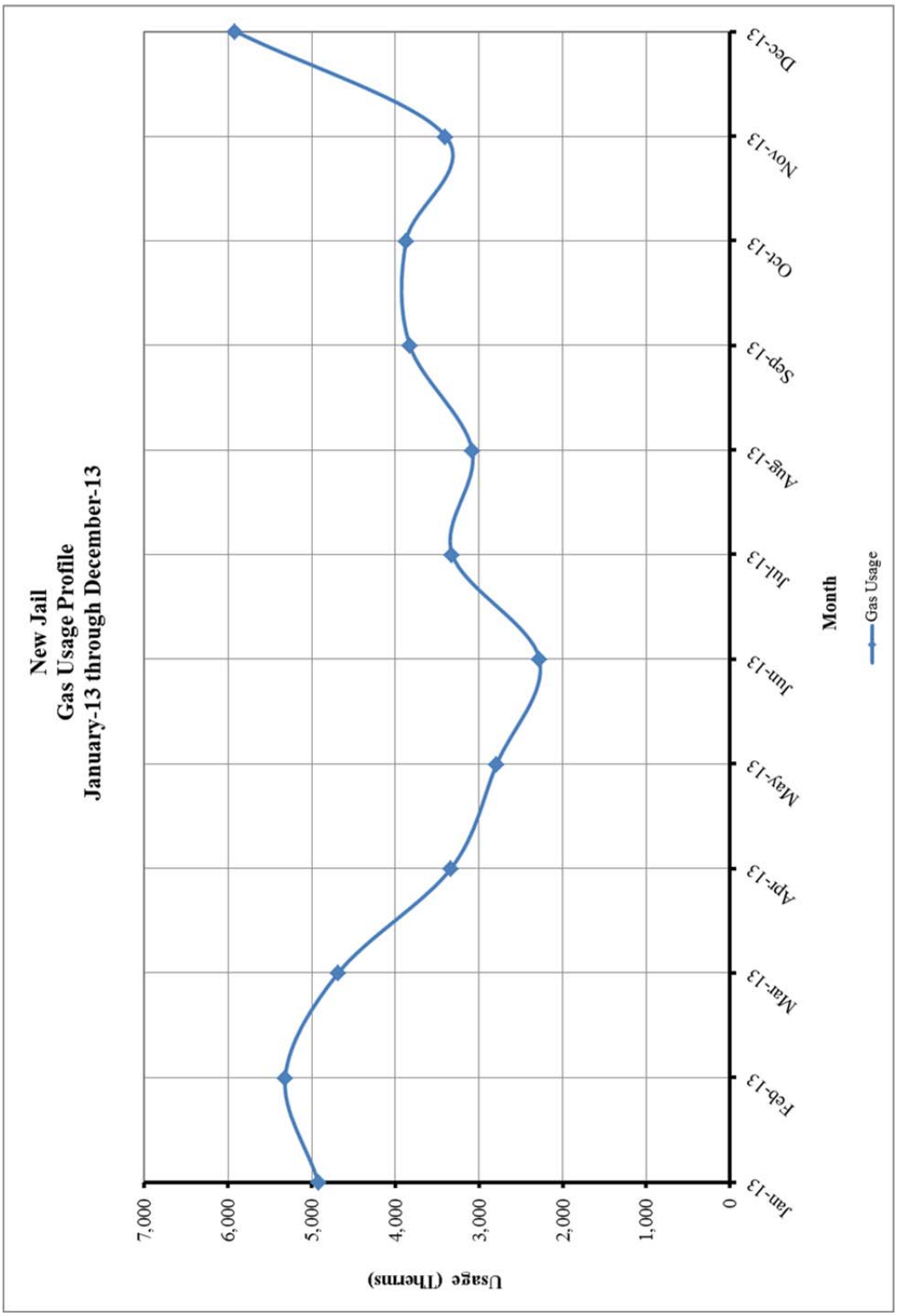


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: New Jersey Natural Gas		
Rate: GSL		
Meter No: 00696618		
Account No: 19-4611-1930-14		
Third Party Utility Provider: Hess		
TPS Meter No: -		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-13	4,921.23	$5,152.58
Feb-13	5,316.98	$5,529.09
Mar-13	4,681.21	$4,980.24
Apr-13	3,332.87	$3,837.26
May-13	2,787.68	$3,353.50
Jun-13	2,279.72	$4,558.25
Jul-13	3,321.40	$3,898.09
Aug-13	3,084.51	$3,471.32
Sep-13	3,830.17	$4,323.34
Oct-13	3,872.23	$4,345.75
Nov-13	3,403.20	$3,825.23
Dec-13	5,915.01	$6,539.27
TOTALS	**46,746.21**	**$53,813.92**
AVERAGE RATE:	**$1.15**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The New Jail is located at 118 Hooper Avenue in Toms River, New Jersey. This 168,000 SF facility was built in 2012, and is connected to Justice Complex and its 4th and 5th Floor Jail area. The building has four story section which houses most of the holding cells, day rooms, and there is a front office section that spans two floors. The facility has areas dedicated for office space, officer training, locker areas, emergency room and exams, storage rooms, and mechanical/utility rooms.

Occupancy Profile

The facility is occupied on a continual basis as prisoners are housed in the facility; however office area staff levels decrease during non-standard working hours. There are approximately 150 employees working at the New Jail along with over 355 inmates with a bed capacity of 446.

Building Envelope

Exterior walls for the building are masonry brick faced with a rigid insulation panel and concrete block with steel rebar. The windows throughout the facility are in very good condition. Typical windows are double pane, 1/4" with aluminum frames, in secure areas an additional pane is one the windows sandwiching the bars with the exterior glass.
The roof consists of a white coated rubber built up roof, with insulation below that is approximately 2" to 5". The white roof reflects sunlight, thereby reducing heat gain on the building due to the roof.

HVAC Systems

Boiler Plant

The Jail is supplied heating hot water by two natural gas fired boilers located in the basement mechanical room. The boilers are H.B. Smith Cast Iron Sectionals model series 28A with an input capacity of 4,517 MBH, a net I.B.R. output capacity of 3,098 MBH, and max output capacity of 3,563 MBH. The boiler efficiency based on the nameplate efficiency is 79%. Heating water is circulated from the boilers through a primary-secondary pumping arrangement. The primary hot water pumps consist of two constant volume 5 horsepower Bell & Gossett pumps with a flow rating of 300 gallons per minute at 30 feet of head pressure. The secondary hot water pumps that distributes out to the terminal equipment heating coils consist of two VFD controlled 15 horsepower Bell & Gossett pumps with a flow rating of 360 gallons per minute and 100 feet of head pressure.

Rooftop Units

The upper roof at the New Jail houses six rooftop air conditioning units fitted with hot water heat and direct expansion cooling manufactured by Trane. The cooling capacity ranges on these units from 10 tons to 50 tons. Units 1, 2, 3 and 4 are also fitted with an energy recovery section on the intake side of the unit with an enthalpy wheel manufactured by ThyCurb. The energy recovery

sections have a dedicated supply and exhaust fan along with the wheel motor. These supply and exhaust fan motors range from 1 to 5 horsepower.

The lower roof at the New Jail houses five rooftop air conditioning units fitted with hot water heat and direct expansion cooling manufactured by Trane. The smaller units have cooling capacities of a 7.5 ton, an 8.5 ton, and a 17 ton. The two larger units have cooling capacities of 75 tons each. These units feed the administrative floors and holding located on the 1st, 2nd, and 2nd Mezzanine levels.

The front roof over the administrative section houses eight condensing units. Four units are manufactured by Mitsubishi with a cooling capacity of 2.5 tons and EER of 7.7 these units some offices along with the connection bridge between the Courthouse East, Justice Complex, and New Jail. The remaining four units are manufactured by Liebert with capacities of 1.5 and 2.5 tons. The units feed the 2nd floor Control Room, 1st and 2nd Floor Emergency Rooms.

Exhaust System

The upper roof on the New Jail has a single Cook Exhaust Fan (EF-17) that serves the shower rooms in the below cell block area. This fan has a 2 horsepower motor and exhaust air flow rate of 4,475 cubic feet per minute. The lower roof and front roof has multiple Cook exhaust fans with fractional horsepower motors.

HVAC System Controls

The New Jail has a Trane Summit System building management system with a control panel located in the Boiler room. The current system schedule shows the building operating 24 hours per day 7 days per week.

Domestic Hot Water

The facility is provided domestic hot water from two PVI non-condensing storage tank type heaters. Each of these units has an input rating of 1,000,000 Btu/h and a 250 gallon storage tank. The units are operated off natural gas and have a peak efficiency of 83%.

The domestic hot water system is coupled with a variable flow booster pump skid manufactured by Armstrong. The skid has there vertical mounted 5 horsepower pumps with a flow rate of 110 gallons per minute at 85 foot of head pressure. The pumps stage on as necessary based on demand in the facility with typically one pump always on. The motors are all premium efficiency motors manufactured by Baldor.

Lighting

Refer to the Investment Grade lighting Audit Appendix for a detailed list of the lighting throughout the facility and estimated operating hours per space.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade	$214,180	$75,248	2.8	427.0%
ECM #2	Lighting Controls	$4,745	$739	6.4	133.6%
ECM #3	XMFR Replacement	$72,000	$9,846	7.3	146.2%
ECM #4	Controls Optimization	$25,000	$9,228	2.7	453.7%
ECM #5	EC Motors	$10,000	$1,130	8.8	69.5%
ECM #6	Premium Efficiency Motors	$8,000	$240	33.3	-40.0%
ECM #7	Lighting Upgrade - Exterior	$30,303	$8,005	3.8	296.2%
ECM #8	Combined Heat and Power	$1,600,000	$94,489	16.9	18.1%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	62 kW Roof Array	$284,805	$20,659	13.8	8.8%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Lighting Upgrade	78.0	627,063	0
ECM #2	Lighting Controls	0.0	6,156	0
ECM #3	XMFR Replacement	12.2	82,050	0
ECM #4	Controls Optimization	0.0	60,436	1,718
ECM #5	EC Motors	0.0	9,413	0
ECM #6	Premium Efficiency Motors	0.5	2,000	0
ECM #7	Lighting Upgrade - Exterior	15.2	66,708	0
ECM #8	Combined Heat and Power	300.0	1,677,948	-86,500
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	62 kW Roof Array	50.7	76,091	0

Table 3
ECM Emissions Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	GREENHOUSE GAS EMISSIONS REDUCTION		
		CO_2 EMISSIONS (LBS)	NO_X EMISSIONS (LBS)	SO_2 EMISSIONS (LBS)
ECM #1	Lighting Upgrade	953,136	1,756	4,076
ECM #2	Lighting Controls	9,357	17	40
ECM #3	XMFR Replacement	124,716	230	533
ECM #4	Controls Optimization	111,968	185	393
ECM #5	EC Motors	14,308	26	61
ECM #6	Premium Efficiency Motors	3,039	6	13
ECM #7	Lighting Upgrade - Exterior	101,397	187	434
ECM #8	Combined Heat and Power	1,538,428	3,902	10,907
Notes:	A. Emissions Reduction based on NJCEP published factors for electric & gas.			

Table 4
Facility Project Summary

FACILITY PROJECT SUMMARY TABLE					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade	$75,248	$223,000	$8,820	$214,180	2.8
Lighting Controls	$739	$5,300	$555	$4,745	6.4
XMFR Replacement	$9,846	$72,000	$0	$72,000	7.3
Controls Optimization	$9,228	$25,000	$0	$25,000	2.7
EC Motors	$1,130	$10,000	$0	$10,000	8.8
Premium Efficiency Motors	$240	$8,000	$0	$8,000	33.3
Lighting Upgrade - Exterior	$8,005	$31,000	$697	$30,303	3.8
~~Combined Heat and Power~~	~~$94,489~~	~~$2,200,000~~	~~$600,000~~	~~$1,600,000~~	~~16.9~~
Total Project	**$104,437**	**$374,300**	**$10,072**	**$364,228**	**3.5**

Note the measure totals in this table do not take into account interactive effects of measures; see Method of Analysis Section III in Executive Report for further explanation.

The facility peak electrical demand and total project savings meet the qualifications for the Pay for Performance Program. If the owner were to pursue this program option they would receive an estimated $195,550 in incentive dollars, see the Installation Funding Options Section for more detail.

Note the CHP was removed from the above totals as it impacts multiple buildings at the downtown campus and should be considered separately from the Energy Conservation Measures for this facility.

ECM #1: Lighting Upgrade – General

Description:

The majority of the interior lighting throughout New Jail is provided with fluorescent fixtures with 32W T8 lamps and electronic ballasts. Although these T8 lamps are considered fairly efficient, further energy savings can be achieved by replacing the existing T8 lamps with new LED style lamps. In addition to the fluorescent tube lamps there are additional fixture types consisting of metal halide lamps and incandescent lamps. These too can be retrofitted to LED style lamps.

This ECM includes retrofitting the interior lighting with new LED type four foot tube lamps, screw in lamp, and mogul base lamps. It is recommended the County consult with a professional engineer prior to retrofitting fixtures to ensure code required minimum light levels will be met.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	78.0
Electric Usage Savings (kWh)	627,063
Electric Cost Savings ($)	$75,248

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$223,000
NJ Smart Start Equipment Incentive ($):	$8,820
Net Installation Cost ($):	$214,180
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$75,248
Total Yearly Savings ($/Yr):	$75,248
Estimated ECM Lifetime (Yr):	15
Simple Payback	2.8
Simple Lifetime ROI	427.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$1,128,720
Internal Rate of Return (IRR)	35%
Net Present Value (NPV)	$684,125.74

ECM #2: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the New Jail are left on unnecessarily, and while security areas cannot be shutdown, there are some office sections which would benefit from automatic shutoff controls. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for non-security risk offices, private restrooms, and IT closets. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = \left(\%\ \text{Savings} \times \text{Controlled Light Energy}\ \left(\text{kWh/Yr}\right)\right)$$

$$\text{Savings.} = \text{Energy Savings}\left(\text{kWh}\right) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	6,156
Electric Cost Savings ($)	$739

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$5,300
NJ Smart Start Equipment Incentive ($):	$555
Net Installation Cost ($):	$4,745
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$739
Total Yearly Savings ($/Yr):	$739
Estimated ECM Lifetime (Yr):	15
Simple Payback	6.4
Simple Lifetime ROI	133.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$11,085
Internal Rate of Return (IRR)	13%
Net Present Value (NPV)	$4,077.13

ECM #3: High Efficiency Transformers

Description:

Electrical distribution transformers play a key role in delivering electrical power to buildings as all the electrical power supplied to the building flows through them. Whether equipment is plugged in and turned on or not transformers continue to operate. Consider their impact on electricity consumption. Some transformers waste as much as 20% of billed electricity.

Older transformers in existing buildings may not have been built to meet the load requirements of today. Over the years electrical distribution has changed very little, however the connected equipment has changed dramatically. This dramatic change is derived from both the type of equipment (mostly electronic in nature) and the density of installed equipment. The impact of this change has had a direct impact on power quality and transformer efficiency.

When newer electronic equipment is introduced into buildings with older electrical systems power quality and transformer efficiency can suffer. According to a Department of Energy study performed in 1996 electronic equipment can increase losses by as much as 2.7 times. In real terms this would mean that a transformer that has a name- plate efficiency of 97% in reality is operating closer to 90% or lower. The difference represents additional costs to operate the transformer. Replacing your older transformers with Power smiths energy efficient E-Saver-C3 or T1000-C3 transformers can improve the reliability of your electronic equipment and significantly reduce electricity waste.

Power smith's energy efficient transformers have substantially lower losses (higher efficiency) than other transformers. These energy savings mean less kilowatt-hours (kWh) consumed and lower energy bills. Electricity demand charges also decline, thanks to reduced energy losses. These savings pay for the transformer many times over its installed life.

There are nine transformers rated at 30, 45, 75, and 112.5 kVA.

Energy Savings Calculations:

See **Appendix** for Manufacturers Transformer Calculation Spreadsheet.

TRANSFORMER SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	12.2
Electric Usage Savings (kWh)	82,050
Electric Cost Savings ($)	$9,846

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$72,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$72,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$9,846
Total Yearly Savings ($/Yr):	$9,846
Estimated ECM Lifetime (Yr):	18
Simple Payback	7.3
Simple Lifetime ROI	146.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$177,229
Internal Rate of Return (IRR)	12%
Net Present Value (NPV)	$63,417.62

ECM #4: Controls Optimization

Description:

The New Jail has a Trane Control System that operates the equipment, it was noticed during survey that scheduling is not being fully utilized to setback temperature and go into unoccupied mode in non 24/7 areas. By maximizing the use of operating schedules in areas that are not continuously occupied through setting back temperatures and reducing outdoor air significant energy can be saved. Further savings may be achievable by more optimally conditioning continuously occupied areas through nighttime and/or daytime temperature drifting to reduce peak cooling and heating load requirements.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the referenced report:

- Energy Management and Control System Savings: 5%-15%.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 5% of the electricity and 5% for the gas utility in this building.

The basis for this ECM is optimizing the existing control system sequences. (Note: There are currently no NJ OCE incentives for HVAC controls upgrades.)

Energy Savings Calculations:

Energy savings for each utility is calculated with the equation below.

$$\text{Energy Savings (Utility)} = \text{Current Energy Consumption} \times \text{Estimated Savings, \%}$$

Following table summarizes energy savings for this facility via implementation of an Energy Management System:

CONTROLS SAVINGS CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
HVAC Usage Electric (kBtu)	4,124,148	3,917,940	206,207
HVAC Usage Gas (kBtu)	3,436,790	3,264,950	171,839
Savings Percentage	-	5.0%	
Electric Site Conversion (kWh/kBtu)	3.412	3.412	
Gas Site Conversion (Therm/kBtu)	100.0	100.0	
Electric Cost ($/kWh)	$0.120	$0.120	
Gas Cost ($/Gallon)	$1.150	$1.150	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	1,208,719	1,148,283	60,436
Gas Usage (Therms)	34,368	32,650	1,718
Energy Cost ($)	$184,569	$175,341	$9,228
COMMENTS:			

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$25,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$25,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$9,228
Total Yearly Savings ($/Yr):	$9,228
Estimated ECM Lifetime (Yr):	15
Simple Payback	2.7
Simple Lifetime ROI	453.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$138,427
Internal Rate of Return (IRR)	37%
Net Present Value (NPV)	$85,168.82

ECM #5: EC Motors

Description:

Electronically Commutated Motors (ECM) are proven to generate substantial savings on small motor applications. These motors currently are available in sizes up to 1 horsepower, and provide efficiencies similar to how NEMA premium efficiency motor would at a large horsepower. The motor works much like a direct current (DC) motor and is without mechanical brushes and the commuter reduces friction losses in the motor. The motors are programmable and can be used for a wide range of applications.

This measure would replace the existing fan motors in the roof top Cook exhaust fans with fractional horsepower motors. In total there are approximately 7 1/4 HP motors, and two 1/8 HP motors.

Energy Savings Calculations:

Measured savings for ECM motors has proven that up to 65% reduction in power can be realized through the installation these motors.

$$\text{Electric Energy (kWh)} = \frac{(\text{Amps} \times \text{Volts} \times \text{Phase}^{1/2})}{1000} \times \text{Power Factor} \times \text{Operating Hours}$$

$$\text{Energy Savings} = \text{Electric Energy} \times \text{Power Reduction (40\%)}$$

EC MOTOR SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	9,413
Electric Cost Savings ($)	$1,130

ELECTRONICALLY COMMUTATED MOTOR CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	PSC	ECM	
Quantity of Motors	7	7	
Motor Nameplate HP	0.25	0.25	
Full Load Amps	5.0		
Voltage	115		
Phase	1		
Power Factor	57%		
Operating Hrs	8760	8760	
Load Reduction	-	40.0%	
Elec Cost ($/kWh)	0.120	0.120	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	20,098	12,059	8,039
Electric Energy Cost ($)	$2,412	$1,447	$965
COMMENTS:			

ELECTRONICALLY COMMUTATED MOTOR CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	PSC	ECM	
Quantity of Motors	2	2	
Motor Nameplate HP	0.13	0.13	
Full Load Amps	3.1		
Voltage	115		
Phase	1		
Power Factor	55%		
Operating Hrs	8760	8760	
Load Reduction	-	40.0%	
Elec Cost ($/kWh)	0.120	0.120	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	3,435	2,061	1,374
Electric Energy Cost ($)	$412	$247	$165
COMMENTS:			

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$10,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$10,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,130
Total Yearly Savings ($/Yr):	$1,130
Estimated ECM Lifetime (Yr):	15
Simple Payback	8.8
Simple Lifetime ROI	69.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$16,950
Internal Rate of Return (IRR)	7%
Net Present Value (NPV)	$3,489.87

ECM #6: Premium Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving the pumps and fans in some of the HVAC equipment are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors.

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
RTU-1-SF	Wheel Supply Motor	3	4,000	86.5%	89.5%
RTU-1-EF	Wheel Exhaust Motor	5	4,000	86.5%	89.5%
RTU-2-SF	Wheel Supply Motor	3	4,000	86.5%	89.5%
RTU-2-EF	Wheel Exhaust Motor	3	4,000	86.5%	89.5%
RTU-3-SF	Wheel Supply Motor	2	4,000	84.0%	86.5%
RTU-3-EF	Wheel Exhaust Motor	2	4,000	84.0%	86.5%
RTU-4-SF	Wheel Supply Motor	1	4,000	78.5%	85.5%
RTU-4-EF	Wheel Exhaust Motor	1	4,000	78.5%	85.5%

Energy Savings Calculations:

$$\text{Electric Usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate}\left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	QTY	MOTOR HP	LOAD FACTOR	EXISTING EFFICIENCY	PROPOSED EFFICIENCY	POWER SAVINGS kW	ENERGY SAVINGS kWH	COST SAVINGS
RTU-1-SF	1	3	75%	86.5%	89.5%	0.07	262	$31
RTU-1-EF	1	5	75%	86.5%	89.5%	0.11	436	$52
RTU-2-SF	1	3	75%	86.5%	89.5%	0.07	262	$31
RTU-2-EF	1	3	75%	86.5%	89.5%	0.07	262	$31
RTU-3-SF	1	2	75%	84.0%	86.5%	0.04	155	$19
RTU-3-EF	1	2	75%	84.0%	86.5%	0.04	155	$19
RTU-4-SF	1	1	75%	78.5%	85.5%	0.06	235	$28
RTU-4-EF	1	1	75%	78.5%	85.5%	0.06	235	$28
TOTAL						**0.5**	**2,000**	**$240**

There are no longer incentives available through NJ Smart Start for premium efficiency motors.

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$8,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$8,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$240
Total Yearly Savings ($/Yr):	$240
Estimated ECM Lifetime (Yr):	20
Simple Payback	33.3
Simple Lifetime ROI	-40.0%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$4,800
Internal Rate of Return (IRR)	-4%
Net Present Value (NPV)	($4,429.41)

ECM #7: Lighting Upgrade – Exterior Lighting

Description:

The exterior lighting at New Jail is currently lit by metal halide and high pressure sodium fixtures. The exterior would be better served with more efficient LED lighting system. Concord Engineering recommends upgrading the lighting to an energy-efficient LED lighting system that includes LED lamps and fixtures for the existing exterior lighting.

This ECM would replace the existing exterior lamps and fixtures with equivalent LED lamps and fixtures.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in **Investment Grade Lighting Audit Appendix** that outlines the proposed retrofits, costs, savings, and payback periods.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	15.2
Electric Usage Savings (kWh)	66,708
Electric Cost Savings ($)	$8,005

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$31,000
NJ Smart Start Equipment Incentive ($):	$697
Net Installation Cost ($):	$30,303
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$8,005
Total Yearly Savings ($/Yr):	$8,005
Estimated ECM Lifetime (Yr):	15
Simple Payback	3.8
Simple Lifetime ROI	296.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$120,075
Internal Rate of Return (IRR)	26%
Net Present Value (NPV)	$65,260.17

ECM #8: 300 kW Combined Heat and Power

Description:

Combined heat and power, or cogeneration is the simultaneous production of two useful forms of energy (electricity and thermal) from a single fuel source. The standard CHP system is comprised of a prime mover (reciprocating engine or turbine generator) and a heat recovery unit. The heat recovery unit utilizes the waste and exhaust heat from the prime mover to produce hot water or steam. The hot water or steam can in turn be utilized to produce chilled water. In some cases the prime mover exhaust can be directly vented into an absorption chiller, which will produce chilled water without the need for a heat recovery unit.

Depending on the design and application CHP systems can have total efficiencies of 70% to 90%. This is much higher than the traditional utility grid generation with simple cycle generators (25% to 45%) and combined cycle power plants (50% to 60%) due to the more complete utilization of the exhaust and/or waste heat from the prime mover. The higher efficiency of CHP can result in significant energy cost savings. In addition the higher fuel efficiency results in lower emissions per unit of power produced compared to traditional electrical and steam generating units.

The efficiency and cost savings of CHP systems depend on the complete use of the exhaust thermal energy from the prime mover. The economics of CHP are very sensitive to the thermal energy production and consumption. If the prime mover exhaust thermal energy cannot be completely used, the system efficiency is reduced, which will negatively impact the project lifecycle cost and payback. Therefore when examining a potential CHP system it is important to consider the thermal load profiles first and then review the electrical profiles.

The County downtown campus has a number of facilities in close proximity that could be tied into a central utility plant in order to generate heating hot water/steam, cooling water, and generate electricity. The facilities considered for this plant include the New Jail, Justice Complex, and Court House. The Jail and Justice Complex provide a 24 hour load component to the plant which can help maintain a constant load and overall higher plant efficiency. For this analysis only the heating and domestic heating was considered for use of recovered heat from the plant. The combination of these loads can support a plant consisting of 300 kilowatts of generation provided by three 100 kW gas fired engines that can generate hot water. The proposed plant will recover the waste engine heat and utilize it for domestic hot water and building space heating/reheating. The installation will include the necessary heat exchangers, electrical interconnection equipment, and radiator. We recommend the County commission a more detailed engineering study for the potential of combined heat and power, prior to moving forward with this ECM.

Energy Savings Calculations:

See **Appendix** for Combined Heat and Power Analysis.

Incentives for this measure are based on current NJ Clean Energy CHP Incentive Program.

EXISTING ENERGY COST W/OUT CHP	
Electric Usage, kWh	8,895,395
Natural Gas Usage, Th	157,610
Total Energy Cost	$1,239,242

PROPOSED ENERGY COST W/ CHP	
Electric Usage, kWh	7,217,447
Natural Gas Usage, Th	244,110
Total Energy Cost	$1,090,342
Savings	**$148,899**

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,200,000
NJ Smart Start Equipment Incentive ($):	$600,000
Net Installation Cost ($):	$1,600,000
Maintenance Savings ($/Yr):	($54,400)
Energy Savings ($/Yr):	$148,889
Total Yearly Savings ($/Yr):	$94,489
Estimated ECM Lifetime (Yr):	20
Simple Payback	16.9
Simple Lifetime ROI	18.1%
Simple Lifetime Maintenance Savings	($1,088,000)
Simple Lifetime Savings	$1,889,780
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($194,242.28)

REM #1: 62 kW Solar System

Description:

The New Jail has a fair amount of available roof space that can be utilized for a 62 kilowatt solar array. The array will produce approximately 76,091 kilowatt-hours annually that will reduce the overall electric usage of the facility by 2.86%. The owner should consult a structural engineer prior to installing any solar array to insure the roof can accommodate the additional weight.

Energy Savings Calculations:

See **Renewable / Distributed Energy Measures Calculations Appendix** for detailed financial summary and proposed solar layout areas. Financial results in table below are based on 100% financing of the system over a fifteen year period.

Energy Savings Summary:

REM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$284,805
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$284,805
Maintenance Savings ($/Yr):	$11,528
Energy Savings ($/Yr):	$9,131
Total Yearly Savings ($/Yr):	$20,659
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.8
Simple Lifetime ROI	8.8%
Simple Lifetime Maintenance Savings	$172,921
Simple Lifetime Savings	$309,885
Internal Rate of Return (IRR)	1.1%
Net Present Value (NPV)	($38,179.42)

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures. While facility staff may already perform some of these items, they are stated to remind the owner of the energy savings benefit of continual performance. These measures are typically not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode.

F. Replace any old CRT Monitors with LED/LCD Type Monitors, which can draw as much as a quarter the power of an equivalent CRT monitor.

G. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Ocean County - New Jail (118 Hooper)

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
ECM #1	Lighting Upgrade	$135,000	$88,000	$8,820	$214,180	$75,248	$0	$75,248	15	$1,128,720	$0	427.0%	2.8	34.73%	$684,125.74
ECM #2	Lighting Controls	$3,300	$2,000	$555	$4,745	$739	$0	$739	15	$11,085	$0	133.6%	6.4	13.13%	$4,077.13
ECM #3	XMFR Replacement	$52,000	$20,000	$0	$72,000	$9,846	$0	$9,846	18	$177,229	$0	146.2%	7.3	11.85%	$63,417.62
ECM #4	Controls Optimization	$10,000	$15,000	$0	$25,000	$9,228	$0	$9,228	15	$138,427	$0	453.7%	2.7	36.57%	$85,168.82
ECM #5	EC Motors	$6,000	$4,000	$0	$10,000	$1,130	$0	$1,130	15	$16,950	$0	69.5%	8.8	7.46%	$3,489.87
ECM #6	Premium Efficiency Motors	$5,500	$2,500	$0	$8,000	$240	$0	$240	20	$4,800	$0	-40.0%	33.3	-4.44%	($4,429.41)
ECM #7	Lighting Upgrade - Exterior	$16,000	$15,000	$697	$30,303	$8,005	$0	$8,005	15	$120,075	$0	296.2%	3.8	25.55%	$65,260.17
ECM #8	Combined Heat and Power	$1,200,000	$1,000,000	$600,000	$1,600,000	$148,889	($54,400)	$94,489	20	$1,889,780	-$1,088,000	18.1%	16.9	1.64%	($194,242.28)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	62 kW Roof Array	$170,883	$113,922	$0	$284,805	$9,131	$11,528	$20,659	15	$309,885	$172,921	8.8%	13.8	1.07%	($38,179.42)

Notes: 1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

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SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives from July 1, 2013 to June 30, 2014:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Cooling

Gas Absorption Chillers	$185 - $450 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $92 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

Closed Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps ≥ 20 hp	$60 per VFD rated hp
Rotary Screw Air Compressors ≥ 25 hp	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot (For fixtures ≥ 150w)	$25 per fixture
HID ≥ 100w Replace with new induction fixture. (must be 30% less watts/fixture than HID system)	$70 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Stairwell and Passageway Luminaires	$40 per fixture
LED Bollard Fixtures	$50 per fixture
Luminaires for Ambient Lighting of Interior Commercial Spaces (1x4, 2x2, 2x4)	$50 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$10 per lamp for R/PAR20,MR/PAR16,Globe,Candelabra or Misc $20 per lamp for R/BR/PAR 30, R/BR/PAR 38-40, A-Lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted (Existing Facilities Only)	$20 per control
Remote Mounted (Existing Facilities Only)	$35 per control
Daylight Dimming Controls	$45 per fixture controlled
Occupancy Based hi-low Dimming Control	$35 per fixture controlled
Occupancy Sensor Remote Mounted	$35 per control

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and an IRR of at least 10%.

APPENDIX C

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

New Jail

Primary Property Function: Prison/Incarceration
Gross Floor Area (ft²): 168,000
Built: 2012

For Year Ending: December 31, 2013
Date Generated: May 23, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
New Jail 118 Hooper Avenue Toms River, New Jersey 08753	Ocean County 239 Washington Street Building #5 Toms River, NJ 08753 (____)____-_____	Joseph Meyers 239 Washington Street Building #5 Toms River, NJ 08753 732-929-2039 JosephMeyers@co.ocean.nj.us

Property ID: 4046909

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
74.8 kBtu/ft²

Source EUI
176.6 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	4,696,347 (37%)
Electric - Grid (kBtu)	7,876,560 (63%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	72
National Median Source EUI (kBtu/ft²)	169.9
% Diff from National Median Source EUI	4%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	1,247

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Jail (118 Hooper)

Split System Units

Tag	CU	CU#1	CU#2
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	62 Annex Roof	New Jail Front Roof	New Jail Front Roof
Area Served	-	-	-
Manufacturer	Carrier	Mitsubishi	Mitsubishi
Model #	38CKC018340	PUY-A30NHA3	PUY-A30NHA3
Serial #	2905E19905	95U00190C	96U002186
Cooling Type	DX (R22)	DX (R410a)	DX (R410a)
Cooling Capacity (Tons)	1.5	2.5	2.5
Cooling Efficiency (SEER/EER)	10 SEER	7.7 EER	7.7 EER
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	27	5	5
ASHRAE Service Life	15	15	15
Remaining Life	(12)	10	10
Comments	208/230 1P	208/230 1P	208/230 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU#3	CU#4	CU
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	New Jail Front Roof	New Jail Front Roof	New Jail Front Roof
Area Served	-	-	-
Manufacturer	Mitsubishi	Mitsubishi	Liebert
Model #	PUY-A30NHA3	PUY-A30NHA3	PFH020A-PL7
Serial #	96U002146	95U00194C	1018N197424
Cooling Type	DX (R410a)	DX (R410a)	DX (R407c)
Cooling Capacity (Tons)	2.5	2.5	1.5
Cooling Efficiency (SEER/EER)	7.7 EER	7.7 EER	10 EER (Est)
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	5	5	5
ASHRAE Service Life	15	15	15
Remaining Life	10	10	10
Comments	208/230 1P	208/230 1P	208/230 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU	CU	CU
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	New Jail Front Roof	New Jail Front Roof	New Jail Front Roof
Area Served	2nd Flr Control Room	1st Floor ER	2nd Flr ER
Manufacturer	Liebert	Liebert	Liebert
Model #	PFH037A-AL7	PFH037A-AL7	PFH037A-AL7
Serial #	0950N192726	0950N192729	0950N192732
Cooling Type	DX (R407c)	DX (R407c)	DX (R407c)
Cooling Capacity (Tons)	2.5	2.5	2.5
Cooling Efficiency (SEER/EER)	10 EER (Est)	10 EER (Est)	10 EER (Est)
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	5	5	5
ASHRAE Service Life	15	15	15
Remaining Life	10	10	10
Comments	460 3P	460 3P	460 3P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Jail (118 Hooper)

AHUs

Tag	RTU-1	RTU-5	RTU-2
Unit Type	RTU	RTU	RTU
Qty	1	1	1
Location	New Jail Upper Roof	New Jail Upper Roof	New Jail Upper Roof
Area Served	Cells	Dayroom, Control Room	Cells
Manufacturer	Trane	Trane	Trane
Model #	TCD241C40JCA	SLHFF5043H46C6B01 D11ABCE	TCD241C40JCA
Serial #	942100018D	C09H01574	942100071D
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	20.0	50.0	20.0
Cooling Efficiency (EER)			
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input (MBH)	-	-	-
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	7.50	20.00	7.50
Approx Age	5	5	5
ASHRAE Service Life	15	15	15
Remaining Life	10	10	10
Comments	ERU Wheel w/ 3 HP SF, 5 HP EF M/N RV5262	5 HP EF	ERU Wheel w/ 3 HP SF, 3 HP EF M/N RV5262

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	RTU-3	RTU-4	RTU-6
Unit Type	RTU	RTU	RTU
Qty	1	1	1
Location	New Jail Upper Roof	New Jail Upper Roof	New Jail Upper Roof
Area Served	Cells	Cells	Dayroom, Control Room
Manufacturer	Trane	Trane	Trane
Model #	TCD181C40JCA	TSC120A4R0A2W00B30002A604	SLHFF5043H46C6BD1D11ABCE
Serial #	942100053D	935101534L	C09H01575
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	15.0	10.0	50.0
Cooling Efficiency (EER)			
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input (MBH)	-	-	-
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	5.00	3.00	20.00
Approx Age	5	5	5
ASHRAE Service Life	15	15	15
Remaining Life	10	10	10
Comments	ERU Wheel w/ 2 HP SF, 2 HP EF M/N RV5245	ERU Wheel w/ 1 HP SF, 1 HP EF M/N RV5230	

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	RTU-8	RTU-9	RTU-10
Unit Type	RTU	RTU	RTU
Qty	1	1	1
Location	New Jail Lower Roof	New Jail Lower Roof	New Jail Lower Roof
Area Served			
Manufacturer	Trane	Trane	Trane
Model #	TCD211C404CA	TSC102A4D0A2TH0B300D2A604	TSC092A4R0A2410B30002A604
Serial #	942100044D	935100583L	935100634L
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	17.5	8.5	7.5
Cooling Efficiency (EER)			
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input (MBH)	-	-	-
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	5.00	2.00	2.00
Approx Age	5	5	5
ASHRAE Service Life	15	15	15
Remaining Life	10	10	10
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	RTU-11	RTU-12
Unit Type	RTU	RTU
Qty	1	1
Location	New Jail Lower Roof	New Jail Lower Roof
Area Served		
Manufacturer	Trane	Trane
Model #	SLHFF754CH67C9B09D	SLHFF754CH67C9B09D
Serial #	C09H01576	C09H01577
Cooling Type	DX	DX
Cooling Capacity (Tons)	75.0	75.0
Cooling Efficiency (EER)		
Heating Type	Hot Water	Hot Water
Heating Input (MBH)	-	-
Heating Efficiency (%)	N/A	N/A
Supply Fan (HP)	40.00	40.00
Approx Age	5	5
ASHRAE Service Life	15	15
Remaining Life	10	10
Comments	10 HP EF	10 HP EF

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Jail (118 Hooper)

Domestic Water Heaters

Tag	HWH-1		
Unit Type	Tank Type Non-Condensing		
Qty	2		
Location	New Jail Boiler Room		
Area Served	New Jail		
Manufacturer	PVI		
Model #	1250 N 250A-TP		
Serial #	0509127298		
Size (Gallons)	250		
Input Capacity (MBH/KW)	1000 MBH		
Recovery (Gal/Hr)	1250		
Efficiency %	80%		
Fuel	Natural Gas		
Approx Age	5		
ASHRAE Service Life	15		
Remaining Life	10		
Comments	Storage Tank 120F		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Jail (118 Hooper)

Boilers

Tag	B-1, 2	
Unit Type	Cast Iron Sectional	
Qty	2	
Location	Boiler Room	
Area Served	New Jail	
Manufacturer	H.B. Smith	
Model #	28A-14	
Serial #	28A-14-090130	
Input Capacity (Btu/Hr)	4,517	
Rated Output Capacity (Btu/Hr)	3,563	
Approx. Efficiency %	79%	
Fuel	Natural Gas	
Approx Age	5	
ASHRAE Service Life	25	
Remaining Life	20	
Comments	1.5 HP Burner Fan	

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Jail (118 Hooper)

Pumps

Tag	DHWP-1	HWP-1, 2	HWP-3, 4
Unit Type	Vertical Skid	End Suction	End Suction
Qty	3	2	2
Location	Boiler Room New Jail	Boiler Room New Jail	Boiler Room New Jail
Area Served	New Jail	Hot Water Secondary	Hot Water Primary
Manufacturer	Armstrong	Bell & Gossett	Bell & Gossett
Model #	3x15x10 4280	1510 BF 10.5	1510 BF 6.425
Serial #	645898	C088242-02F90	C088241-01F90
Horse Power	5.0	15.0	5.0
Flow	110 GPM, 85' HD	360 GPM, 100' HD	300 GPM, 30' HD
Motor Info	Baldor Fr 184JH	US Electric Fr 254T	Weg Fr 184T
Electrical Power	240/480V 3P	460V 3P	208-203/460V 3P
RPM	1750	1775	1755
Motor Efficiency %	90.2%	92.4%	89.5%
Approx Age	5	5	5
ASHRAE Service Life	18	18	18
Remaining Life	13	13	13
Comments	Has VFD	Has VFD	No VFD

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

New Jail (118 Hooper)

Exhaust Fans

Tag	EF-17	EF-18	EF-01
Unit Type	Up Blast	Up Blast	Up Blast
Qty	1	1	1
Location	New Jail Upper Roof	New Jail Lower Roof	New Jail Lower Roof
Area Served	Dorm Shower Rooms		
Manufacturer	Cook	Cook	Cook
Model #	225 TCNHU 225-TCNHU-B	120ACFU 120R3B	120ACRU-120R3B50
Serial #	-	214SL175072-0170017901	214SC72-01/0000701
Motor (HP)	2	1/4	1/4
Electrical (V/H/P)	460/60/3	115/60/1	115/60/1
Approx Age	5	5	5
ASHRAE Service Life	20	20	20
Remaining Life	15	15	15
Comments	4475 CFM, 3/4" ESP, on	875 CFM, On	390 CFM, Off

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Exhaust Fans

Tag	EF-02	EF-03	EF-04
Unit Type	Up Blast	Up Blast	Up Blast
Qty	1	1	1
Location	New Jail Lower Roof	New Jail Lower Roof	New Jail Lower Roof
Area Served			
Manufacturer	Cook	Cook	Cook
Model #	120ACRU-120R3B	90ACRUL-90R15DL	120ACRU-120R3B33
Serial #	214SC75072-01/0002001	2148C75072-01/0003201	214SC75072-01/0004401
Motor (HP)	1/4	1/8	1/4
Electrical (V/H/P)	115/60/1	115/60/1	115/60/1
Approx Age	5	5	5
ASHRAE Service Life	20	20	20
Remaining Life	15	15	15
Comments	970 CFM, Off	180 CFM, On	570 CFM, Off

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Exhaust Fans

Tag	EF-05	EF-06	EF-19
Unit Type	Up Blast	Up Blast	Up Blast
Qty	1	1	1
Location	New Jail Lower Roof	New Jail Lower Roof	New Jail Lower Roof
Area Served			
Manufacturer	Cook	Cook	Cook
Model #	90ACRUL-90R15DL	90ACRUL-90R15DL	120ACRU-120R3B
Serial #	214SC75072-01/0005701	214SC75072-01/0006901	214SC75072-02/0000701
Motor (HP)	1/8	1/8	1/4
Electrical (V/H/P)	115/60/1	115/60/1	115/60/1
Approx Age	5	5	5
ASHRAE Service Life	20	20	20
Remaining Life	15	15	15
Comments	180 CFM, Off	270 CFM, Off	675 CFM, On

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Exhaust Fans

Tag	EF-07	EF-14	EF-13
Unit Type	Up Blast	Up Blast	Up Blast
Qty	1	1	1
Location	New Jail Lower Roof	New Jail Front Roof	New Jail Front Roof
Area Served			
Manufacturer	Cook	Cook	Cook
Model #	135ACRU-135R3B	90ACRUH-90R15DH	90ACRUH-90R15DH
Serial #	214SC75072-01/0008101	214SC75072-01/0015501	214SC75072-01/0014301
Motor (HP)	1/4	1/4	1/8
Electrical (V/H/P)	115/60/1	115/60/1	115/60/1
Approx Age	5	5	5
ASHRAE Service Life	20	20	20
Remaining Life	15	15	15
Comments	1440 CFM, On	300 CFM, On	300 CFM, On

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Exhaust Fans

Tag	EF-12	EF-11	EF-09
Unit Type	Up Blast	Up Blast	Up Blast
Qty	1	1	1
Location	New Jail Front Roof	New Jail Front Roof	New Jail Front Roof
Area Served			
Manufacturer	Cook	Cook	Cook
Model #	120ACRU-120R3B33	120ACRU-120R3B33	120ACRU-120R3B
Serial #	214SC75072-01/0013001	214SC752072-01/0011701	214SC75072-01/0010501
Motor (HP)	1/4	1/4	1/4
Electrical (V/H/P)	115/60/1	115/60/1	115/60/1
Approx Age	5	5	5
ASHRAE Service Life	20	20	20
Remaining Life	15	15	15
Comments	500 CFM, On	700 CFM, On	845 CFM, On

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Exhaust Fans

Tag	EF-08
Unit Type	Up Blast
Qty	1
Location	New Jail Front Roof
Area Served	
Manufacturer	Cook
Model #	165ACRU-165R5B
Serial #	214SC75072-01/0009301
Motor (HP)	1/2
Electrical (V/H/P)	115/60/1
Approx Age	5
ASHRAE Service Life	20
Remaining Life	15
Comments	2140 CFM, Off

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

APPENDIX E

CEG Project #: 1C14065
Facility Name: New Jail
Address: 118 Hooper Avenue
City, State, Zip Toms River, NJ 08753

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
4th Floor																																	
d	1. Control Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b1	2. Corridor - CC1O	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	3. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	4. 4B Day Room	8760	28" 400w MH	1	465	11	5.12	44,807	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	11	1.02	8,961	4.09	35,846	$4,302	0	No New Controls	0	0.0%	0	$0	$4,400.00	$1,650.00	$6,050.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b6	4. 4B Day Room	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Max. Security	2	52	9	0.47	4,100	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	9	0.23	1,971	0.24	2,129	$255	0	No New Controls	0	0.0%	0	$0	$360.00	$180.00	$540.00	$180.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b3	4. 4B Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	4. 4B Day Room	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	5. 4B Cells (32)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	32	1.98	11,587	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	32	1.15	6,728	0.83	4,859	$583	0	No New Controls	0	0.0%	0	$0	$1,920.00	$1,920.00	$3,840.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
b1	6. Showers	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
I1	6. Showers	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Wet Location, Med. Security	2	52	2	0.10	911	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	2	0.05	438	0.05	473	$57	0	No New Controls	0	0.0%	0	$0	$80.00	$40.00	$120.00	$40.00	1.41	$0.00	$0.00	$0.00	FALSE	-
L	7. Rec Yard	8760	400w MH, Recessed Mount	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	8. Multi Purpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	9. Video Visiting	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	10. Laundry	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	11. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	12. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	13. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	14. Restroom	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	15. Trash (2)	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	16. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	17. 4A Day Room	8760	28" 400w MH	1	465	6	2.79	24,440	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	6	0.56	4,888	2.23	19,552	$2,346	0	No New Controls	0	0.0%	0	$0	$2,400.00	$900.00	$3,300.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b6	17. 4A Day Room	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Max. Security	2	52	7	0.36	3,189	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	7	0.18	1,533	0.19	1,656	$199	0	No New Controls	0	0.0%	0	$0	$280.00	$140.00	$420.00	$140.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b3	17. 4A Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	5	0.31	2,716	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	1,577	0.13	1,139	$137	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	17. 4A Day Room	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	18. 4A Cells (20)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	20	1.24	7,242	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	20	0.72	4,205	0.52	3,037	$364	0	No New Controls	0	0.0%	0	$0	$1,200.00	$1,200.00	$2,400.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
L	19. Rec Yard	8760	400w MH, Recessed Mount	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	20. Multipurpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	21. Video Visiting	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	22. Laundry	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
b1	23. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	23. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	24. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	25. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	26. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	27. OIC Office	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	126	$15	$120.00	$120.00	$240.00	$0.00	4.39	$50.00	$50.00	$100.00	FALSE	6.61
b2	28. Stiarwell 1	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	10	0.62	5,431	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	10	0.36	3,154	0.26	2,278	$273	0	No New Controls	0	0.0%	0	$0	$600.00	$600.00	$1,200.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
3rd Floor																																		
d	1. Control Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b1	2. Corridor - CC09	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	7	0.43	3,802	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.18	1,594	$191	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	3. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	4. 3B Day Room	8760	28" 400w MH	1	465	11	5.12	44,807	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	11	1.02	8,961	4.09	35,846	$4,302	0	No New Controls	0	0.0%	0	$0	$4,400.00	$1,650.00	$6,050.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b6	4. 3B Day Room	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Max. Security	2	52	9	0.47	4,100	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	9	0.23	1,971	0.24	2,129	$255	0	No New Controls	0	0.0%	0	$0	$360.00	$180.00	$540.00	$180.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b3	4. 3B Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	4. 3B Day Room	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	5. 3B Cells (32)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	32	1.98	11,587	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	32	1.15	6,728	0.83	4,859	$583	0	No New Controls	0	0.0%	0	$0	$1,920.00	$1,920.00	$3,840.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
b1	6. Showers	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
I1	6. Showers	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Wet Location, Med. Security	2	52	2	0.10	911	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	2	0.05	438	0.05	473	$57	0	No New Controls	0	0.0%	0	$0	$80.00	$40.00	$120.00	$40.00	1.41	$0.00	$0.00	$0.00	FALSE	-
L	7. Rec Yard	8760	400w MH, Recessed Mount	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	8. Multi Purpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	9. Video Visiting	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	10. Laundry	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	11. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	12. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	13. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	14. Restroom	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	15. Trash (2)	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	16. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	17. 3A Day Room	8760	28" 400w MH	1	465	6	2.79	24,440	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	6	0.56	4,888	2.23	19,552	$2,346	0	No New Controls	0	0.0%	0	$0	$2,400.00	$900.00	$3,300.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b6	17. 3A Day Room	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Max. Security	2	52	7	0.36	3,189	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	7	0.18	1,533	0.19	1,656	$199	0	No New Controls	0	0.0%	0	$0	$280.00	$140.00	$420.00	$140.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b3	17. 3A Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	5	0.31	2,716	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	1,577	0.13	1,139	$137	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	17. 3A Day Room	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
b3	18. 3A Cells (20)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	20	1.24	7,242	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	20	0.72	4,205	0.52	3,037	$364	0	No New Controls	0	0.0%	0	$0	$1,200.00	$1,200.00	$2,400.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
L	19. Rec Yard	8760	400w MH, Recessed Mount	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	20. Multipurpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	21. Video Visiting	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	22. Laundry	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	23. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	23. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	24. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	25. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	26. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	27. Corridor CC08	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	12	0.74	6,517	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	12	0.43	3,784	0.31	2,733	$328	0	No New Controls	0	0.0%	0	$0	$720.00	$720.00	$1,440.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	28. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	29. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	30. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	31. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	32. Restroom	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	33. Trash	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	34. Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	7	0.43	3,802	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.18	1,594	$191	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	34. Day Room	8760	28" 400w MH	1	465	8	3.72	32,587	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	8	0.74	6,517	2.98	26,070	$3,128	0	No New Controls	0	0.0%	0	$0	$3,200.00	$1,200.00	$4,400.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
k1	35. Rec Yard	8760	28" 400w MH	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	36. Multipurpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	37. Showers	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	38. Cells (12)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	1	0.06	362	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	210	0.03	152	$18	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
b3	39. Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	7	0.43	3,802	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.18	1,594	$191	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	39. Day Room	8760	28" 400w MH	1	465	8	3.72	32,587	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	8	0.74	6,517	2.98	26,070	$3,128	0	No New Controls	0	0.0%	0	$0	$3,200.00	$1,200.00	$4,400.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
k1	40. Rec Yard	8760	28" 400w MH	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	41. Multipurpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	42. Showers	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	43. Cells (12)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	1	0.06	362	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	210	0.03	152	$18	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
b1	44. Corridor DBU23	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	14	0.87	7,604	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	14	0.50	4,415	0.36	3,189	$383	0	No New Controls	0	0.0%	0	$0	$840.00	$840.00	$1,680.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	45. Mech Room	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
p	46. Mech Room	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	47. Stairwell 2	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	6	0.37	3,259	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	1,892	0.16	1,367	$164	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	48. Corridor	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	49. Vestibule	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	50. Vestibule	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	51. Library	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	8	0.50	1,488	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	864	0.21	624	$75	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	12.82	$0.00	$0.00	$0.00	FALSE	-
c	52. Librarian	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c	53. Storage	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c	54. Custody Admin.	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	55. Capts Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	22.26
c	56. Conf. Room	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	22.26
c	57. Capts Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	22.26
c	58. Warden	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	6	0.37	967	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	562	0.16	406	$49	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	112	$13	$360.00	$360.00	$720.00	$0.00	14.79	$50.00	$50.00	$100.00	$20.00	5.94
c	59. Restroom (3)	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	3	0.19	484	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	281	0.08	203	$24	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
2nd Floor - MH & MS																																	
d	1. Control Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b1	2. Corridor - CC07	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	7	0.43	3,802	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.18	1,594	$191	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	3. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k	4. MS Day Room	8760	22" 175w MH	1	195	11	2.15	18,790	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	60	11	0.66	5,782	1.49	13,009	$1,561	0	No New Controls	0	0.0%	0	$0	$2,750.00	$1,650.00	$4,400.00	$0.00	2.82	$0.00	$0.00	$0.00	FALSE	-
b3	5. 3B Cells (16)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	16	0.99	5,793	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	16	0.58	3,364	0.42	2,429	$292	0	No New Controls	0	0.0%	0	$0	$960.00	$960.00	$1,920.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
b1	6. Showers	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
I1	6. Showers	8760	1x3, 2 Lamp, 26w CFL, Surface Mount, Wet Location, Med. Security	2	52	2	0.10	911	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	2	0.05	438	0.05	473	$57	0	No New Controls	0	0.0%	0	$0	$80.00	$40.00	$120.00	$40.00	1.41	$0.00	$0.00	$0.00	FALSE	-
L1	7. Rec Yard	8760	175w MH Wallpack	1	205	4	0.82	7,183	Replace Fixture	42w LED Wall Pack	1	42	4	0.17	1,472	0.65	5,712	$685	0	No New Controls	0	0.0%	0	$0	$800.00	$600.00	$1,400.00	$200.00	1.75	$0.00	$0.00	$0.00	FALSE	-
b1	8. Multi Purpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	12. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	13. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	14. Restroom	2600	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
p	15. Trash (2)	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	16. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k	17. MH Day Room	8760	22" 175w MH	1	195	6	1.17	10,249	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	60	6	0.36	3,154	0.81	7,096	$851	0	No New Controls	0	0.0%	0	$0	$1,500.00	$900.00	$2,400.00	$0.00	2.82	$0.00	$0.00	$0.00	FALSE	-
b3	18. 3A Cells (10)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	10	0.62	3,621	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	10	0.36	2,102	0.26	1,518	$182	0	No New Controls	0	0.0%	0	$0	$600.00	$600.00	$1,200.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
L1	19. Rec Yard	8760	175w MH Wallpack	1	205	4	0.82	7,183	Replace Fixture	42w LED Wall Pack	1	42	4	0.17	1,472	0.65	5,712	$685	0	No New Controls	0	0.0%	0	$0	$800.00	$600.00	$1,400.00	$200.00	1.75	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
b1	20. Multipurpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	21. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b	22. Psych Office	8760	1x4, 2 Lamp, 32w T8, Recessed Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	23. Elec. Room	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	2	0.12	149	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	86	0.05	62	$7	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	32.05	$0.00	$0.00	$0.00	FALSE	-
2nd Floor - Infirmary & Admin																																		
b1	1. Corridor CC06	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	7	0.43	3,802	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.18	1,594	$191	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	2. Elec. Room	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	1	0.06	74	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	43	0.03	31	$4	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	32.05	$0.00	$0.00	$0.00	FALSE	-
d	3. Dental Sallyport	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	4. Medical Sallyport	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	5. Dental Operatory	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	6	0.56	4,941	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	6	0.34	2,943	0.23	1,997	$240	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	6. Corridor	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	4	0.38	3,294	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	4	0.22	1,962	0.15	1,332	$160	0	No New Controls	0	0.0%	0	$0	$320.00	$240.00	$560.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	7. Triage	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	6	0.56	4,941	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	6	0.34	2,943	0.23	1,997	$240	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	8. Exam	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	9. Xray	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	4	0.38	3,294	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	4	0.22	1,962	0.15	1,332	$160	0	No New Controls	0	0.0%	0	$0	$320.00	$240.00	$560.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b4	10. Rubber Room (2)	8760	1x4, 2 Lamp, 32w T8, Recessed Mount, Max. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	11. Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	1	0.09	823	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	491	0.04	333	$40	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	12. Pharmacy	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	3	0.28	2,470	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	3	0.17	1,472	0.11	999	$120	0	No New Controls	0	0.0%	0	$0	$240.00	$180.00	$420.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	13. Head Nurse	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b5	14. Holding Cells	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	12	0.74	6,517	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	12	0.43	3,784	0.31	2,733	$328	0	No New Controls	0	0.0%	0	$0	$720.00	$720.00	$1,440.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	15. Storage	1200	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	226	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	134	0.08	91	$11	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	25.58	$0.00	$0.00	$0.00	FALSE	-
b5	16. Control Vestibule	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	17. Corridor	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	16	1.50	13,175	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	16	0.90	7,849	0.61	5,326	$639	0	No New Controls	0	0.0%	0	$0	$1,280.00	$960.00	$2,240.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	18. Nurse Station	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	6	0.56	4,941	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	6	0.34	2,943	0.23	1,997	$240	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	19. Clean Linen	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	1	0.09	823	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	491	0.04	333	$40	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	20. Soiled Linen	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	1	0.09	823	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	491	0.04	333	$40	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	21. Restroom	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	1	0.09	244	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	146	0.04	99	$12	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$0.00	11.81	$0.00	$0.00	$0.00	FALSE	-
c	22. Corridor	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c3	23. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	81	0.03	81	$10	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$50.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c3	24. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	81	0.03	81	$10	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$50.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c	25. Breakroom	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	26. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c	27. Work Area	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
c	28. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c	29. Records	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	30. Program Services MD04B - WalkwayFiles	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	3	0.19	484	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	281	0.08	203	$24	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c	31. Program Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	12	0.74	1,934	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	12	0.43	1,123	0.31	811	$97	0	No New Controls	0	0.0%	0	$0	$720.00	$720.00	$1,440.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c	32. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c3	33. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	81	0.03	81	$10	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$50.00	11.37	$0.00	$0.00	$0.00	FALSE	-
b1	34. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	35. Women's Locker Room	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	7	0.43	3,802	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	2,208	0.18	1,594	$191	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	442	$53	$420.00	$420.00	$840.00	$0.00	4.39	$200.00	$50.00	$250.00	$35.00	4.06
c	36. Contractor's Locker Room	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	5	0.31	2,716	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	1,577	0.13	1,139	$137	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	315	$38	$300.00	$300.00	$600.00	$0.00	4.39	$50.00	$50.00	$100.00	$20.00	2.11
n	37. Cert Room	8760	175w MH Recessed Mount	1	195	3	0.59	5,125	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	60	3	0.18	1,577	0.41	3,548	$426	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	315	$38	$750.00	$450.00	$1,200.00	$0.00	2.82	$50.00	$50.00	$100.00	$20.00	2.11
n	38. Gym	5840	175w MH Recessed Mount	1	195	6	1.17	6,833	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	60	6	0.36	2,102	0.81	4,730	$568	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	420	$50	$1,500.00	$900.00	$2,400.00	$0.00	4.23	$50.00	$50.00	$100.00	FALSE	1.98
n	39. Gym	5840	175w MH Recessed Mount	1	195	6	1.17	6,833	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	60	6	0.36	2,102	0.81	4,730	$568	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	420	$50	$1,500.00	$900.00	$2,400.00	$0.00	4.23	$50.00	$50.00	$100.00	FALSE	1.98
c	40. Men's Locker Room	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	14	0.87	7,604	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	14	0.50	4,415	0.36	3,189	$383	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	883	$106	$840.00	$840.00	$1,680.00	$0.00	4.39	$400.00	$100.00	$500.00	$35.00	4.39
a1	40. Men's Locker Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	41. Vestibule	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	42. Classroom	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	9	0.56	1,451	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	9	0.32	842	0.23	608	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	168	$20	$540.00	$540.00	$1,080.00	$0.00	14.79	$50.00	$50.00	$100.00	$20.00	3.96
c	43. Break Room	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	3	0.19	1,629	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	946	0.08	683	$82	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	189	$23	$180.00	$180.00	$360.00	$0.00	4.39	$50.00	$50.00	$100.00	$20.00	3.52
c	44. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	19	$2	$60.00	$60.00	$120.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	44.52
c	45. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	19	$2	$60.00	$60.00	$120.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	44.52
c	46. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	374	0.10	270	$32	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	75	$9	$240.00	$240.00	$480.00	$0.00	14.79	$50.00	$50.00	$100.00	$20.00	8.90
c3	47. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	12	0.74	1,934	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	12	0.37	967	0.37	967	$116	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	193	$23	$1,440.00	$480.00	$1,920.00	$600.00	11.37	$400.00	$100.00	$500.00	$35.00	20.03
c3	48. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c3	49. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c	50. Corridor	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	16	0.99	8,690	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	16	0.58	5,046	0.42	3,644	$437	0	No New Controls	0	0.0%	0	$0	$960.00	$960.00	$1,920.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	51. Phone Vendor	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
c3	52. Admin Waiting	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	6	0.37	967	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	6	0.19	484	0.19	484	$58	0	No New Controls	0	0.0%	0	$0	$720.00	$240.00	$960.00	$300.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c3	53. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	15	0.93	2,418	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	15	0.47	1,209	0.47	1,209	$145	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	242	$29	$1,800.00	$600.00	$2,400.00	$750.00	11.37	$400.00	$100.00	$500.00	$35.00	16.03
c3	54. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c3	55. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c3	56. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	2	0.06	161	0.06	161	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	32	$4	$240.00	$80.00	$320.00	$100.00	11.37	$50.00	$50.00	$100.00	FALSE	25.85
c3	57. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	6	0.37	967	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	6	0.19	484	0.19	484	$58	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	97	$12	$720.00	$240.00	$960.00	$300.00	11.37	$50.00	$50.00	$100.00	$20.00	6.89

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
c3	58. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c3	59. Conf. Room	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c3	60. Files	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
c3	61. Office	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	64	$8	$480.00	$160.00	$640.00	$200.00	11.37	$50.00	$50.00	$100.00	$20.00	10.34
Ground Floor - MA & IW																																		
d	1. Control Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b1	2. Corridor	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	3. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	4. Day Room	8760	28" 400w MH	1	465	11	5.12	44,807	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	11	1.02	8,961	4.09	35,846	$4,302	0	No New Controls	0	0.0%	0	$0	$4,400.00	$1,650.00	$6,050.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b6	4. Day Room	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Max. Security	2	52	9	0.47	4,100	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	9	0.23	1,971	0.24	2,129	$255	0	No New Controls	0	0.0%	0	$0	$360.00	$180.00	$540.00	$180.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b3	4. Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	4. Day Room	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	5. Cells (32)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	32	1.98	11,587	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	32	1.15	6,728	0.83	4,859	$583	0	No New Controls	0	0.0%	0	$0	$1,920.00	$1,920.00	$3,840.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
b1	6. Showers	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
I1	6. Showers	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Wet Location, Med. Security	2	52	2	0.10	911	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	2	0.05	438	0.05	473	$57	0	No New Controls	0	0.0%	0	$0	$80.00	$40.00	$120.00	$40.00	1.41	$0.00	$0.00	$0.00	FALSE	-
L	7. Rec Yard	8760	400w MH, Recessed Mount	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	8. Multi Purpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	9. Video Visiting	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	10. Laundry	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	11. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	12. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	13. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	14. Restroom	2600	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
p	15. Trash (2)	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	2	0.12	149	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	86	0.05	62	$7	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	32.05	$0.00	$0.00	$0.00	FALSE	-
b1	16. Sally Port	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
k1	17. Day Room	8760	28" 400w MH	1	465	6	2.79	24,440	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	6	0.56	4,888	2.23	19,552	$2,346	0	No New Controls	0	0.0%	0	$0	$2,400.00	$900.00	$3,300.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b6	17. Day Room	8760	1x1, 2 Lamp, 26w CFL, Surface Mount, Max. Security	2	52	7	0.36	3,189	Relamp	PHILIPS 120V EnduraLED 12.5W A19 2700K	2	25	7	0.18	1,533	0.19	1,656	$199	0	No New Controls	0	0.0%	0	$0	$280.00	$140.00	$420.00	$140.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b3	17. Day Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	5	0.31	2,716	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	1,577	0.13	1,139	$137	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b2	17. Day Room	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b3	18. Cells (20)	5840	1x4, 2 Lamp, 32w T8, Surface Mount, Max. Security	2	62	20	1.24	7,242	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	20	0.72	4,205	0.52	3,037	$364	0	No New Controls	0	0.0%	0	$0	$1,200.00	$1,200.00	$2,400.00	$0.00	6.59	$0.00	$0.00	$0.00	FALSE	-
L	19. Rec Yard	8760	400w MH, Recessed Mount	1	465	4	1.86	16,294	Bypass Ballast, Relamp	Solstice 93w LED Retrofit	1	93	4	0.37	3,259	1.49	13,035	$1,564	0	No New Controls	0	0.0%	0	$0	$1,600.00	$600.00	$2,200.00	$0.00	1.41	$0.00	$0.00	$0.00	FALSE	-
b1	20. Multipurpose Room	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-

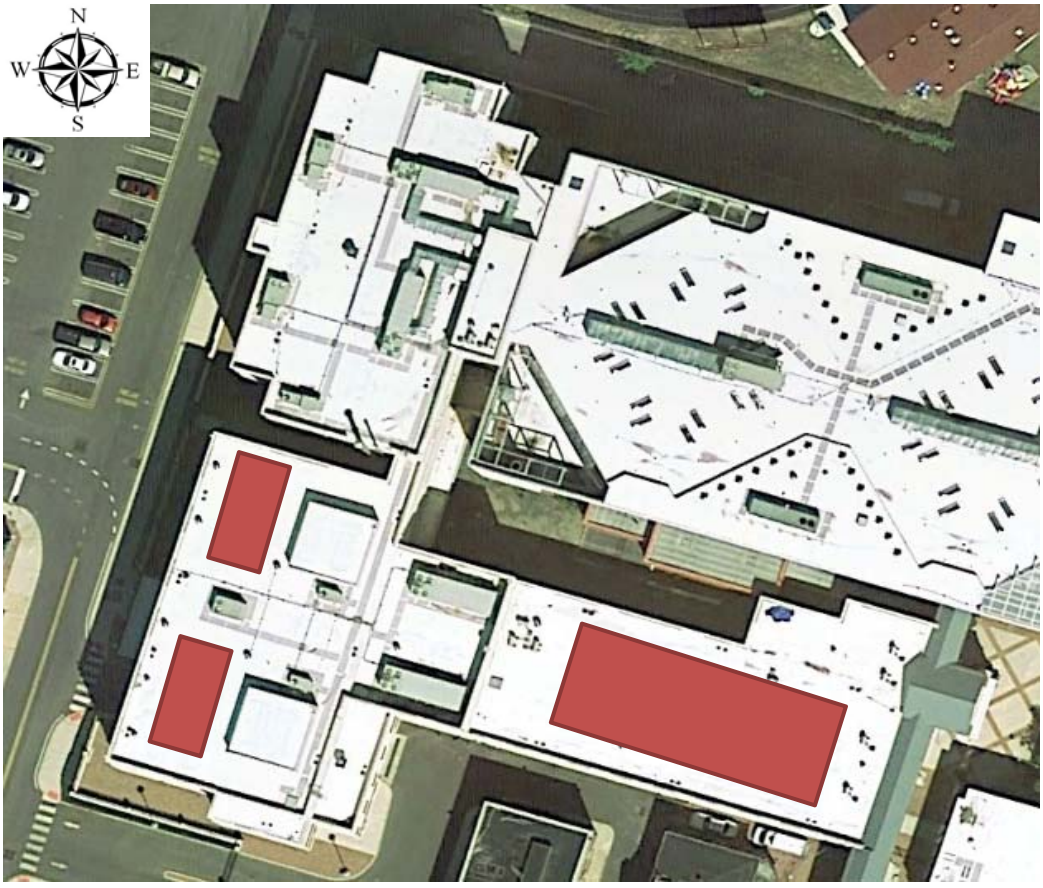
			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
b1	21. Video Visiting	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	22. Laundry	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	23. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	23. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	24. Vestibule	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	25. Interview	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	26. Shower	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	27. Attourny Visiting	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	14	1.32	11,528	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	14	0.78	6,868	0.53	4,660	$559	0	No New Controls	0	0.0%	0	$0	$1,120.00	$840.00	$1,960.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	28. waiting	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	4	0.38	3,294	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	4	0.22	1,962	0.15	1,332	$160	0	No New Controls	0	0.0%	0	$0	$320.00	$240.00	$560.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b2	29. Stair 7	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	5	0.31	2,716	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	1,577	0.13	1,139	$137	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p1	31. Vestibule	8760	1x4, 3 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	3	94	1	0.09	823	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	491	0.04	333	$40	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
p1	32. IT	8760	1x4, 3 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	3	94	3	0.28	2,470	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	3	0.17	1,472	0.11	999	$120	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	294	$35	$240.00	$180.00	$420.00	$0.00	3.50	$50.00	$50.00	$100.00	$20.00	2.26
p1	33. IT	8760	1x4, 3 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	3	94	4	0.38	3,294	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	4	0.22	1,962	0.15	1,332	$160	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	392	$47	$320.00	$240.00	$560.00	$0.00	3.50	$50.00	$50.00	$100.00	$20.00	1.70
p1	34. IT	8760	1x4, 3 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	196	$24	$160.00	$120.00	$280.00	$0.00	3.50	$50.00	$50.00	$100.00	$20.00	3.40
Ground Floor - Booking Release																																		
d	1. Open Area	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	20	1.88	16,469	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	20	1.12	9,811	0.76	6,658	$799	0	No New Controls	0	0.0%	0	$0	$1,600.00	$1,200.00	$2,800.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b5	2. Cells	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	20	1.24	10,862	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	20	0.72	6,307	0.52	4,555	$547	0	No New Controls	0	0.0%	0	$0	$1,200.00	$1,200.00	$2,400.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b4	3. Rubber Room	8760	1x4, 2 Lamp, 32w T8, Recessed Mount, Max. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	4. Medical Sallyport	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b5	5. Interview	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b5	6. Patdown	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	7. Sally Port	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
c3	8. Booking	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	1,086	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	2	0.06	543	0.06	543	$65	0	No New Controls	0	0.0%	0	$0	$240.00	$80.00	$320.00	$100.00	3.38	$0.00	$0.00	$0.00	FALSE	-
d	9. Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d	10. Sally Port	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	3	0.28	2,470	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	3	0.17	1,472	0.11	999	$120	0	No New Controls	0	0.0%	0	$0	$240.00	$180.00	$420.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b	11. Shower	8760	1x4, 2 Lamp, 32w T8, Recessed Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b	12. Shower	8760	1x4, 2 Lamp, 32w T8, Recessed Mount, Med. Security	2	62	1	0.06	543	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	315	0.03	228	$27	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	13. Corridor	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	6	0.56	4,941	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	6	0.34	2,943	0.23	1,997	$240	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b5	14. Holding Cells	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b5	15. Office	2600	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
b5	16. Office	2600	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	14.79	$0.00	$0.00	$0.00	FALSE	-
d	17. Tran	2600	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	489	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	291	0.08	198	$24	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	11.81	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
d	18. Waiting	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	1	0.09	823	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	491	0.04	333	$40	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
c3	19. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	81	0.03	81	$10	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$50.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c3	20. Security	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	3	0.19	1,629	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	3	0.09	815	0.09	815	$98	0	No New Controls	0	0.0%	0	$0	$360.00	$120.00	$480.00	$150.00	3.38	$0.00	$0.00	$0.00	FALSE	-
d	21. Sally Port	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	3	0.28	2,470	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	3	0.17	1,472	0.11	999	$120	0	No New Controls	0	0.0%	0	$0	$240.00	$180.00	$420.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
n	22. Vehicular Sally Port	8760	175w MH Recessed Mount	1	195	18	3.51	30,748	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	60	18	1.08	9,461	2.43	21,287	$2,554	0	No New Controls	0	0.0%	0	$0	$4,500.00	$2,700.00	$7,200.00	$0.00	2.82	$0.00	$0.00	$0.00	FALSE	-
c2	23. Armory	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	4	114	5	0.57	4,993	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	4	72	5	0.36	3,154	0.21	1,840	$221	0	No New Controls	0	0.0%	0	$0	$400.00	$300.00	$700.00	$0.00	3.17	$0.00	$0.00	$0.00	FALSE	-
b	24. Breakroom	8760	1x4, 2 Lamp, 32w T8, Recessed Mount, Med. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b5	25. Changing Rooms	8760	1x4, 2 Lamp, 32w T8, Corner Mount, Max. Security	2	62	2	0.12	1,086	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	631	0.05	456	$55	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
b1	26. Corridor	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	4	0.25	2,172	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.10	911	$109	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p1	27. Property Storage	8760	1x4, 3 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	3	94	18	1.69	14,822	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	18	1.01	8,830	0.68	5,992	$719	0	No New Controls	0	0.0%	0	$0	$1,440.00	$1,080.00	$2,520.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
b1	28. Corridor	8760	1x4, 2 Lamp, 32w T8, Surface Mount, Med. Security	2	62	18	1.12	9,776	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	18	0.65	5,676	0.47	4,100	$492	0	No New Controls	0	0.0%	0	$0	$1,080.00	$1,080.00	$2,160.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c	29. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	19	1.18	3,063	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	19	0.68	1,778	0.49	1,284	$154	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	356	$43	$1,140.00	$1,140.00	$2,280.00	$0.00	14.79	$400.00	$100.00	$500.00	$35.00	10.89
d	30. Alcove	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
c3	31. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	81	0.03	81	$10	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$50.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c3	32. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	81	0.03	81	$10	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$50.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c	33. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	22.26
c	34. Office	2600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$0.00	14.79	$50.00	$50.00	$100.00	FALSE	22.26
c3	35. Conference Room	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	9	0.56	1,451	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	9	0.28	725	0.28	725	$87	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	145	$17	$1,080.00	$360.00	$1,440.00	$450.00	11.37	$50.00	$50.00	$100.00	$20.00	4.60
c4	36. Video Visiting	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	25	1.55	13,578	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	25	0.78	6,789	0.78	6,789	$815	0	No New Controls	0	0.0%	0	$0	$3,000.00	$1,000.00	$4,000.00	$1,250.00	3.38	$0.00	$0.00	$0.00	FALSE	-
c3	37. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	0	No New Controls	0	0.0%	0	$0	$480.00	$160.00	$640.00	$200.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c3	38. Restroom	2600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	4	0.25	645	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	4	0.12	322	0.12	322	$39	0	No New Controls	0	0.0%	0	$0	$480.00	$160.00	$640.00	$200.00	11.37	$0.00	$0.00	$0.00	FALSE	-
c3	39. Staff Entry	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	6	0.37	3,259	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	6	0.19	1,629	0.19	1,629	$196	0	No New Controls	0	0.0%	0	$0	$720.00	$240.00	$960.00	$300.00	3.38	$0.00	$0.00	$0.00	FALSE	-
c3	40. Vestibule	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	8	0.50	4,345	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	8	0.25	2,172	0.25	2,172	$261	0	No New Controls	0	0.0%	0	$0	$960.00	$320.00	$1,280.00	$400.00	3.38	$0.00	$0.00	$0.00	FALSE	-
c4	41. Vestibule	8760	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	6	0.37	3,259	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	6	0.19	1,629	0.19	1,629	$196	0	No New Controls	0	0.0%	0	$0	$720.00	$240.00	$960.00	$300.00	3.38	$0.00	$0.00	$0.00	FALSE	-
Basement																																		
p	1. Gen Set	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	7	0.43	521	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	302	0.18	218	$26	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$0.00	32.05	$0.00	$0.00	$0.00	FALSE	-
p	2. Elec Room	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	11	0.68	5,974	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	11	0.40	3,469	0.29	2,505	$301	0	No New Controls	0	0.0%	0	$0	$660.00	$660.00	$1,320.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
c1	3. Corridor	8760	2x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	2	62	14	0.87	7,604	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	14	0.50	4,415	0.36	3,189	$383	0	No New Controls	0	0.0%	0	$0	$840.00	$840.00	$1,680.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	4. Mech Room	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	11	0.68	5,974	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	11	0.40	3,469	0.29	2,505	$301	0	No New Controls	0	0.0%	0	$0	$660.00	$660.00	$1,320.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
p	5. Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	3	0.19	223	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	130	0.08	94	$11	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$0.00	32.05	$0.00	$0.00	$0.00	FALSE	-
p	6. Storage	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	2	0.12	149	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	86	0.05	62	$7	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$0.00	32.05	$0.00	$0.00	$0.00	FALSE	-
d1	7. Control Vestibule	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens, Med. Security	3	94	2	0.19	1,647	Bypass Ballast, Relamp	4' Alledta 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	2	0.11	981	0.08	666	$80	0	No New Controls	0	0.0%	0	$0	$160.00	$120.00	$280.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
b2	8. Stair 4	8760	1x4, 2 Lamp, 32w T8, Wall Mount, Med. Security	2	62	8	0.50	4,345	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	2,523	0.21	1,822	$219	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$0.00	4.39	$0.00	$0.00	$0.00	FALSE	-
d	9. Corridor	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens, Med. Security	3	94	4	0.38	3,294	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	4	0.22	1,962	0.15	1,332	$160	0	No New Controls	0	0.0%	0	$0	$320.00	$240.00	$560.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
d1	10. Sally Port	8760	2x4, 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens, Med. Security	3	94	6	0.56	4,941	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	6	0.34	2,943	0.23	1,997	$240	0	No New Controls	0	0.0%	0	$0	$480.00	$360.00	$840.00	$0.00	3.50	$0.00	$0.00	$0.00	FALSE	-
Exterior																																		
716	Exterior	4400	HYDREL 100w MH Area Light (White)	1	120	7	0.84	3,696	Replace Fixture	RAB 26w LED Area Light (White)	1	26	7	0.18	801	0.66	2,895	$347	0	No New Controls	0	0.0%	0	$0	$1,400.00	$700.00	$2,100.00	$350.00	5.04	$0.00	$0.00	$0.00	FALSE	-
717	Exterior	4400	HYDREL 100w MH Wall Pack Light (White)	1	120	5	0.60	2,640	Replace Fixture	RAB 26w LED Wall Pack Light (White)	1	26	5	0.13	572	0.47	2,068	$248	0	No New Controls	0	0.0%	0	$0	$1,000.00	$500.00	$1,500.00	$255.00	5.02	$0.00	$0.00	$0.00	FALSE	-
718	Exterior	4400	HYDREL 100w MH Area Light, Ceiling Mount (White)	1	120	1	0.12	528	Replace Fixture	RAB 26w LED Area Light, Ceiling Mount (White)	1	26	1	0.03	114	0.09	414	$50	0	No New Controls	0	0.0%	0	$0	$200.00	$100.00	$300.00	$52.00	5.00	$0.00	$0.00	$0.00	FALSE	-
719	Exterior	4400	65w R30 Lamp	1	65	4	0.26	1,144	Relamp	PHILIPS 120V 11w LED R30	1	11	4	0.04	194	0.22	950	$114	0	No New Controls	0	0.0%	0	$0	$80.00	$80.00	$160.00	$40.00	1.05	$0.00	$0.00	$0.00	FALSE	-
720	Exterior	4400	Recessed Down Light, 250w MH	1	285	63	17.96	79,002	Bypass Ballast, Relamp	Solstice 74w LED Retrofit	1	78	63	4.91	21,622	13.04	57,380	$6,886	0	No New Controls	0	0.0%	0	$0	$12,600.00	$12,600.00	$25,200.00	$0.00	3.66	$0.00	$0.00	$0.00	FALSE	-
721	Exterior	4400	Square Pole Mount Area Light, 400w HPS, 360 Dergree	1	465	2	0.93	4,092	Bypass Ballast, Relamp	120w LED Retrofit, 360 Degree	1	124	2	0.25	1,091	0.68	3,001	$360	0	No New Controls	0	0.0%	0	$0	$400.00	$400.00	$800.00	$0.00	2.22	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					**1,403**	**155**	**1,147,547**					**1,403**	**62**	**453,775**	**93**	**693,772**	**$83,253**			**39**		**6,156**	**$739**	**$150,320**	**$102,610**	**$252,930**	**$9,517**	**2.92**	**$3,300**	**$1,950**	**$5,250**	**$555.00**	**6.36**

APPENDIX F

Location Description	Area (Sq FT)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Total KW_{AC}	Panel Weight (41.9 lbs)	W/SQFT
New Jail	6400	SHARP ND-240QCJ	261	17.5	4,578	62.64	76,091	50.7	10,936	13.68



= Proposed PV Roof Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.

Project Name: **LGEA Solar PV Project - New Jail**
Location: **Toms River, NJ**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$284,805
Annual kWh Production	76,091
Annual Energy Cost Reduction	$9,131
Average Annual SREC Revenue	$11,528

Simple Payback: **13.79** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.120**
Financing Rate: 6.00%
Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/kWh) $0.152

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$0	0	0	0	$0	0	0	0	0
1	$0	76,091	$9,131	$0	$19,023	$16,760	$12,080	($686)	($686)
2	$0	75,711	$9,405	$0	$18,928	$16,015	$12,826	($508)	($1,194)
3	$0	75,332	$9,687	$0	$18,833	$15,224	$13,617	($320)	($1,514)
4	$0	74,955	$9,978	$0	$14,991	$14,384	$14,456	($3,871)	($5,386)
5	$0	74,581	$10,277	$768	$14,916	$13,492	$15,348	($4,415)	($9,801)
6	$0	74,208	$10,585	$764	$14,842	$12,545	$16,295	($4,178)	($13,979)
7	$0	73,837	$10,903	$761	$11,075	$11,540	$17,300	($7,622)	($21,601)
8	$0	73,467	$11,230	$757	$11,020	$10,473	$18,367	($7,347)	($28,948)
9	$0	73,100	$11,567	$753	$10,965	$9,341	$19,500	($7,061)	($36,009)
10	$0	72,735	$11,914	$749	$7,273	$8,138	$20,702	($10,402)	($46,411)
11	$0	72,371	$12,271	$745	$7,237	$6,861	$21,979	($10,077)	($56,488)
12	$0	72,009	$12,639	$742	$7,201	$5,505	$23,335	($9,742)	($66,230)
13	$0	71,649	$13,019	$738	$3,582	$4,066	$24,774	($12,977)	($79,207)
14	$0	71,291	$13,409	$734	$3,565	$2,538	$26,302	($12,601)	($91,808)
15	$0	70,934	$13,811	$731	$3,547	$916	$27,924	($12,213)	($104,021)
	Totals:	1,102,270	$169,825	$8,242	$166,998	$147,797	$284,805	($104,021)	($563,284)

Net Present Value (NPV) **($72,050)**

APPENDIX G

COMBINED HEAT AND POWER PLANT OPERATION ANALYSIS

Existing System Efficiency	80%	CHP Availability	92%		
		Electric Heat Value (Btu/kWh)	3,412		
		Gas Heat Value (Btu/therm)	100,000		
CHP Plant Capacity, kW	300.0	Electric Cost ($/kWh)	$0.120		
Number of Engines	3	Natural Gas Cost ($/therm)	$1.090		
		CHP Gas Cost ($/therm)	$0.902		
		Electrical System Losses	2.0%		

Results Summary

Electric Generated, kWh	1,677,948	$201,354
Fuel Used by CHP, therm	222,505	$200,700
Fuel Saved by CHP, therm	136,005	$148,246
Total Cost Savings:		$148,899

Month	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	**Annual**
Previous Read Date	1/1/13	2/1/13	3/1/13	4/1/13	5/1/13	6/1/13	7/1/13	8/1/13	9/1/13	10/1/13	11/1/13	12/1/13	
Current Read Date	1/31/13	2/28/13	3/31/13	4/30/13	5/31/13	6/30/13	7/31/13	8/31/13	9/30/13	10/31/13	11/30/13	12/31/13	
Days	31	28	31	30	31	30	31	31	30	31	30	31	**365**
Fuel Usage (therms)	25,232	21,200	18,809	10,303	7,285	5,501	5,684	5,684	7,244	10,486	17,970	22,211	**157,610**
Fuel Usage (kBtu)	2,523,173	2,119,968	1,880,935	1,030,290	728,509	550,113	568,450	568,450	724,371	1,048,627	1,797,025	2,221,053	**15,760,963**
Heat Load													
Actual Load (kBtu)	2,018,538	1,695,974	1,504,748	824,232	582,807	440,090	454,760	454,760	579,496	838,902	1,437,620	1,776,843	**12,608,770**
Actual Average Load, MBH	2,713	2,524	2,023	1,145	783	611	611	611	805	1,128	1,997	2,388	
Engine #1	On	(On / Off)			System Efficiency	80.2%							
Operating Load, kW	100	100	100	100	100	40	40	40	100	100	100	100	
Generator Electronics Rejection, kBtu	18,481	16,692	18,481	17,885	18,481	17,885	18,481	18,481	17,885	18,481	17,885	18,481	
Rejection Electric Usage, kWh	270	244	270	262	270	262	270	270	262	270	262	270	
Fuel Usage, therms	8,643	7,806	8,643	8,364	8,643	3,588	3,708	3,708	8,364	8,643	8,364	8,643	**87,115**
Electric Generation, kWh	67,079	60,588	67,079	64,915	67,079	25,966	26,832	26,832	64,915	67,079	64,915	67,079	
Recoverable Heat, kBtu	458,866	414,459	458,866	444,064	458,866	218,809	226,102	226,102	444,064	458,866	444,064	458,866	
Facility Heat Load, kBtu	2,018,538	1,695,974	1,504,748	824,232	582,807	440,090	454,760	454,760	579,496	838,902	1,437,620	1,776,843	
Rejected Heat, kBtu	0	0	0	0	0	0	0	0	0	0	0	0	
Electric to Reject Heat, kWh	0	0	0	0	0	0	0	0	0	0	0	0	
Net Electric Generation, kWh	66,809	60,343	66,809	64,654	66,809	25,704	26,561	26,561	64,654	66,809	64,654	66,809	**667,175**
Recovered Heat Used, kBtu	458,866	414,459	458,866	444,064	458,866	218,809	226,102	226,102	444,064	458,866	444,064	458,866	**4,711,993**
Remaining Heat Load, kBtu	1,559,672	1,281,515	1,045,882	380,168	123,941	221,281	228,657	228,657	135,433	380,036	993,557	1,317,977	
Remaining Avg. Load, MBH	2,096	1,907	1,406	528	167	307	307	307	188	511	1,380	1,771	
Engine #2	On	(On / Off)			System Efficiency	78.9%							
Operating Load, kW	100	100	100	40	40	40	40	40	40	40	100	100	
Generator Electronics Rejection, kBtu	18,481	16,692	18,481	17,885	18,481	17,885	18,481	18,481	17,885	18,481	17,885	18,481	
Rejection Electric Usage, kWh	270	244	270	262	270	262	270	270	262	270	262	270	
Fuel Usage, therms	8,643	7,806	8,643	3,588	3,708	3,588	3,708	3,708	3,588	3,708	8,364	8,643	**67,695**
Electric Generation, kWh	67,079	60,588	67,079	25,966	26,832	25,966	26,832	26,832	25,966	26,832	64,915	67,079	
Recoverable Heat, kBtu	458,866	414,459	458,866	218,809	226,102	218,809	226,102	226,102	218,809	226,102	444,064	458,866	
Facility Heat Load, kBtu	1,559,672	1,281,515	1,045,882	380,168	123,941	221,281	228,657	228,657	135,433	380,036	993,557	1,317,977	
Rejected Heat, kBtu	0	0	0	0	102,161	0	0	0	83,376	0	0	0	
Electric to Reject Heat, kWh	0	0	0	0	487	0	0	0	398	0	0	0	
Net Electric Generation, kWh	66,809	60,343	66,809	25,704	26,074	25,704	26,561	26,561	25,307	26,561	64,654	66,809	**507,897**
Recovered Heat Used, kBtu	458,866	414,459	458,866	218,809	123,941	218,809	226,102	226,102	135,433	226,102	444,064	458,866	**3,610,418**
Remaining Heat Load, kBtu	1,100,806	867,056	587,016	161,360	0	2,473	2,555	2,555	0	153,934	549,493	859,111	
Remaining Avg. Load, MBH	1,480	1,290	789	224	0	3	3	3	0	207	763	1,155	
Engine #3	On	(On / Off)			System Efficiency	63.1%							
Operating Load, kW	100	100	100	40	40	40	40	40	40	40	100	100	
Generator Electronics Rejection, kBtu	18,481	16,692	18,481	17,885	18,481	17,885	18,481	18,481	17,885	18,481	17,885	18,481	
Rejection Electric Usage, kWh	270	244	270	262	270	262	270	270	262	270	262	270	
Fuel Usage, therms	8,643	7,806	8,643	3,588	3,708	3,588	3,708	3,708	3,588	3,708	8,364	8,643	**67,695**
Electric Generation, kWh	67,079	60,588	67,079	25,966	26,832	25,966	26,832	26,832	25,966	26,832	64,915	67,079	
Recoverable Heat, kBtu	458,866	414,459	458,866	218,809	226,102	218,809	226,102	226,102	218,809	226,102	444,064	458,866	
Facility Heat Load, kBtu	1,100,806	867,056	587,016	161,360	0	2,473	2,555	2,555	0	153,934	549,493	859,111	
Rejected Heat, kBtu	0	0	0	57,449	226,102	216,336	223,547	223,547	218,809	72,168	0	0	
Electric to Reject Heat, kWh	0	0	0	274	1,078	1,032	1,066	1,066	1,044	344	0	0	
Net Electric Generation, kWh	66,809	60,343	66,809	25,430	25,483	24,673	25,495	25,495	24,661	26,217	64,654	66,809	**502,877**
Recovered Heat Used, kBtu	458,866	414,459	458,866	161,360	0	2,473	2,555	2,555	0	153,934	444,064	458,866	**2,557,998**
Remaining Heat Load, kBtu	641,941	452,596	128,151	0	0	0	0	0	0	0	105,429	400,245	
Remaining Avg. Load, MBH	863	674	172	0	0	0	0	0	0	0	146	538	
CHP Plant Totals					Plant Efficiency	74.6%							
Fuel Usage, therm	25,928	23,419	25,928	15,541	16,059	10,765	11,124	11,124	15,541	16,059	25,092	25,928	**222,505**
Generated Electric, kWh	200,426	181,030	200,426	115,789	118,366	76,082	78,618	78,618	114,621	119,587	193,961	200,426	**1,677,948**
Recovered Thermal Used, kBtu	1,376,597	1,243,378	1,376,597	824,232	582,807	440,090	454,760	454,760	579,496	838,902	1,332,191	1,376,597	**10,880,409**
Fuel Use Offset by Thermal, Therm	17,207	15,542	17,207	10,303	7,285	5,501	5,684	5,684	7,244	10,486	16,652	17,207	**136,005**

ECONOMIC ANALYSIS: THREE (3) 100 KW COMBINED HEAT AND POWER PROJECT

Gross Construction Cost	$2,200,000	Electric Rate ($/kWh)	$0.1200	Existing Plant Thermal Efficiency	80%
NJ CHP Incentive	$600,000	Natural Gas Rate ($/Th)	$1.0900	CHP Availability	92%
Matching Utility Incentive	$0	CHP Gas Rate ($/Th)	$0.9020	CHP Average Load Factor	
Net Construction Cost	$1,600,000	Utility Escalation Rate	3%		
		Maintenance Escalation	2%	Federal Tax Rate	0%
Interest Rate (10 yr)	3.50%				
Discount Rate	3%				

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Existing Electric Usage (kWh)	8,895,395											
Existing Natural Gas Usage (Th)	268,495											
NG Used for Hot Water Heating (Th)	157,610											
CHP Operation												
Gross Electric Generation (kWh)		1,694,287	1,694,287	1,694,287	1,694,287	1,694,287	1,694,287	1,694,287	1,694,287	1,694,287	1,694,287	16,942,867
Parasitic Electric Usage (kWh)		16,339	16,339	16,339	16,339	16,339	16,339	16,339	16,339	16,339	16,339	163,385
Net Electric Generation (kWh)		1,677,948	1,677,948	1,677,948	1,677,948	1,677,948	1,677,948	1,677,948	1,677,948	1,677,948	1,677,948	16,779,482
CHP NG Fuel Usage (Th)		222,505	222,505	222,505	222,505	222,505	222,505	222,505	222,505	222,505	222,505	2,225,054
Gross Recovered Heat (Th)		123,039	123,039	123,039	123,039	123,039	123,039	123,039	123,039	123,039	123,039	1,230,390
Unused/Rejected Heat (Th)		14,235	14,235	14,235	14,235	14,235	14,235	14,235	14,235	14,235	14,235	142,349
Net Recovered Heat (Th)		108,804	108,804	108,804	108,804	108,804	108,804	108,804	108,804	108,804	108,804	1,088,041
Offset Natural Gas Usage (Th)		136,005	136,005	136,005	136,005	136,005	136,005	136,005	136,005	136,005	136,005	1,360,051
Additional Thermal Gas Usage (Th)		21,605	21,605	21,605	21,605	21,605	21,605	21,605	21,605	21,605	21,605	216,045
Utility Savings												
Generated Electric Value		$201,354	$207,394	$213,616	$220,025	$226,625	$233,424	$240,427	$247,640	$255,069	$262,721	$2,308,295
Recovered Thermal Value		$148,246	$152,693	$157,274	$161,992	$166,852	$171,857	$177,013	$182,323	$187,793	$193,427	$1,699,469
Gross Utility Cost Savings		$349,599	$360,087	$370,890	$382,017	$393,477	$405,281	$417,440	$429,963	$442,862	$456,148	$4,007,765
CHP Operating Costs												
Natural Gas Fuel Cost		$200,700	$206,721	$212,923	$219,310	$225,889	$232,666	$239,646	$246,836	$254,241	$261,868	$2,300,799
Annual Maintenance Costs		$54,400	$55,488	$56,597	$57,729	$58,884	$60,062	$61,263	$62,488	$63,738	$65,013	$595,660
Gross Operating Costs		$255,099	$262,208	$269,520	$277,039	$284,773	$292,728	$300,909	$309,324	$317,978	$326,880	$2,896,460
Net Annual Operating Savings		$94,500	$97,879	$101,370	$104,977	$108,704	$112,554	$116,531	$120,640	$124,884	$129,267	$1,111,305
Project Costs												
Received NJ Incentive		$0	$600,000									
Capital Outlay	($330,000)											
Financed Amount	$1,870,000											
Interest Expense		($65,450)	($59,871)	($54,097)	($48,120)	($41,935)	($35,533)	($28,906)	($22,048)	($14,950)	($7,604)	($378,514)
Principle Payment		($159,401)	($164,980)	($170,755)	($176,731)	($182,917)	($189,319)	($195,945)	($202,803)	($209,901)	($217,248)	($1,870,000)
Total Payment		($224,851)	($224,851)	($224,851)	($224,851)	($224,851)	($224,851)	($224,851)	($224,851)	($224,851)	($224,851)	($2,248,514)
Tax Benefits												
Buisness Energy Investment Tax Credit		$0										
Bonus Depreciation (Year 1)		0%										
MACRS Accelerated Depreciation		0%	0%	0.00%	0.00%	0.00%	0.00%					
End of Year Depreciable Costs*												
Bonus Depreciation (Year 1)		$0										
Accelperated Depreciation		$0	$0	$0	$0	$0	$0					
Total Depreciation		$0	$0	$0	$0	$0	$0					
Cash Value of Depreciation		$0	$0	$0	$0	$0	$0					
Net Cashflow	($330,000)	($130,351)	$473,027	($123,481)	($119,874)	($116,148)	($112,298)	($108,320)	($104,212)	($99,968)	($95,584)	($867,209)
Cumulative Cashflow		($460,351)	$12,676	($110,805)	($230,679)	($346,827)	($459,125)	($567,445)	($671,657)	($771,625)	($867,209)	

Simple Payback, yrs*:	**16.93**
Net Present Value:	**($720,882)**
Internal Rate of Return:	-

COMMENTS:

1. Depreciation Value based on Project Cost after incentives.
2. Simple payback is calculated based on Year 1 operating savings only.
3. Th = Therms

OCEAN COUNTY

COURT HOUSE

101 HOOPER AVENUE
TOMS RIVER, NJ 08753

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	General Service Primary
Third Party Supplier:	N/A

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	General Service Large (GSL)
Third Party Supplier:	Hess

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: JCP&L
Rate: General Service Primary
Meter No: L013639669
Account No: 10-00-17-4222-78
Third Party Utility Provider: -
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Jan-13	138,400	259.8	$19,476
Feb-13	92,000	213.0	$14,376
Mar-13	117,600	281.6	$16,362
Apr-13	256,800	575.3	$34,964
May-13	151,200	350.0	$20,916
Jun-13	149,600	346.3	$21,215
Jul-13	197,618	428.9	$24,863
Aug-13	247,321	592.2	$34,658
Sep-13	200,942	498.4	$23,536
Oct-13	117,837	240.7	$24,151
Nov-13	171,761	411.3	$21,207
Dec-13	121,768	445.1	$16,690
Totals	**1,962,847**	**592.2 Max**	**$272,414**

AVERAGE DEMAND **386.9 KW average**
AVERAGE RATE **$0.139 $/kWh**

Figure 1
Electricity Usage Profile

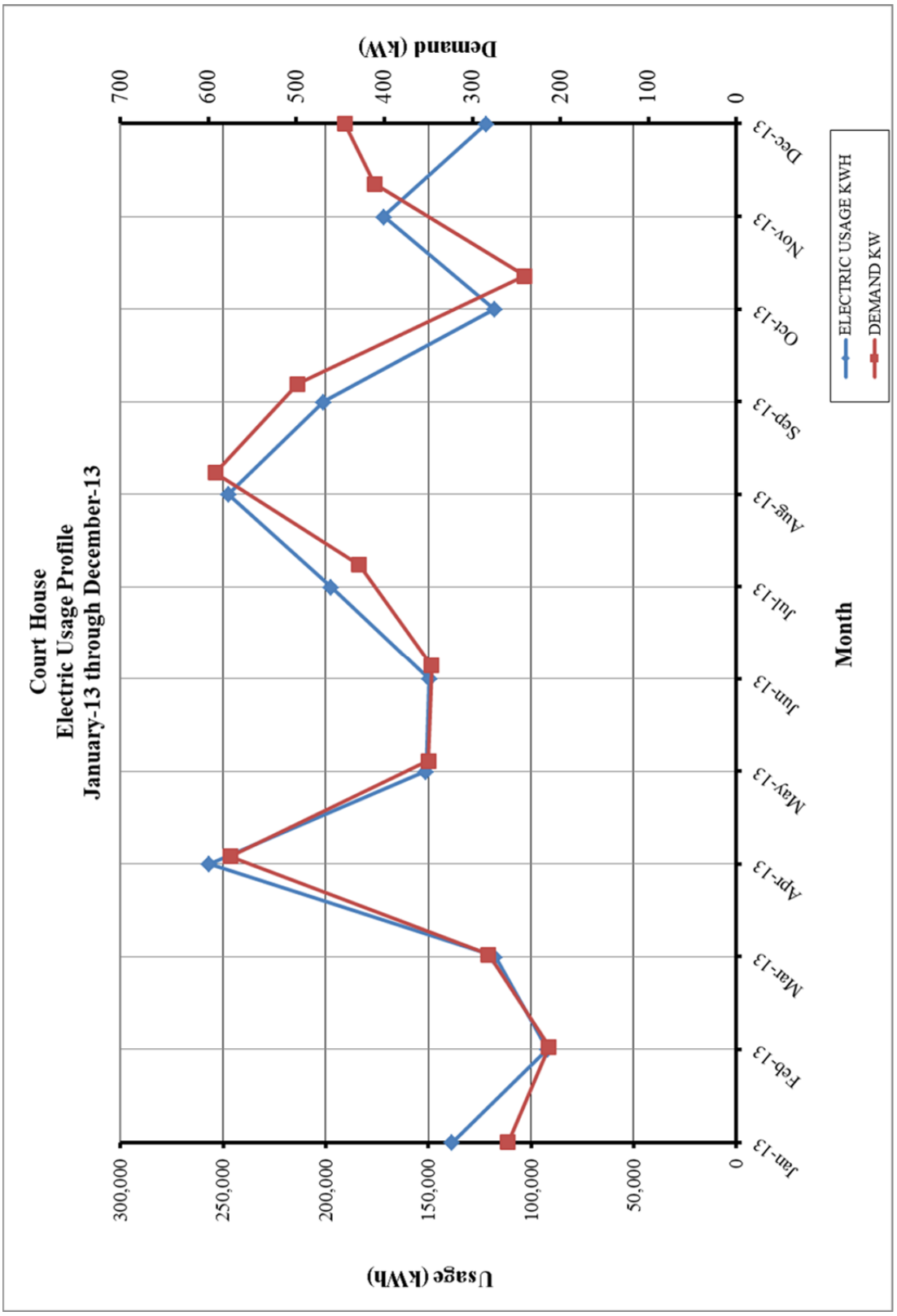
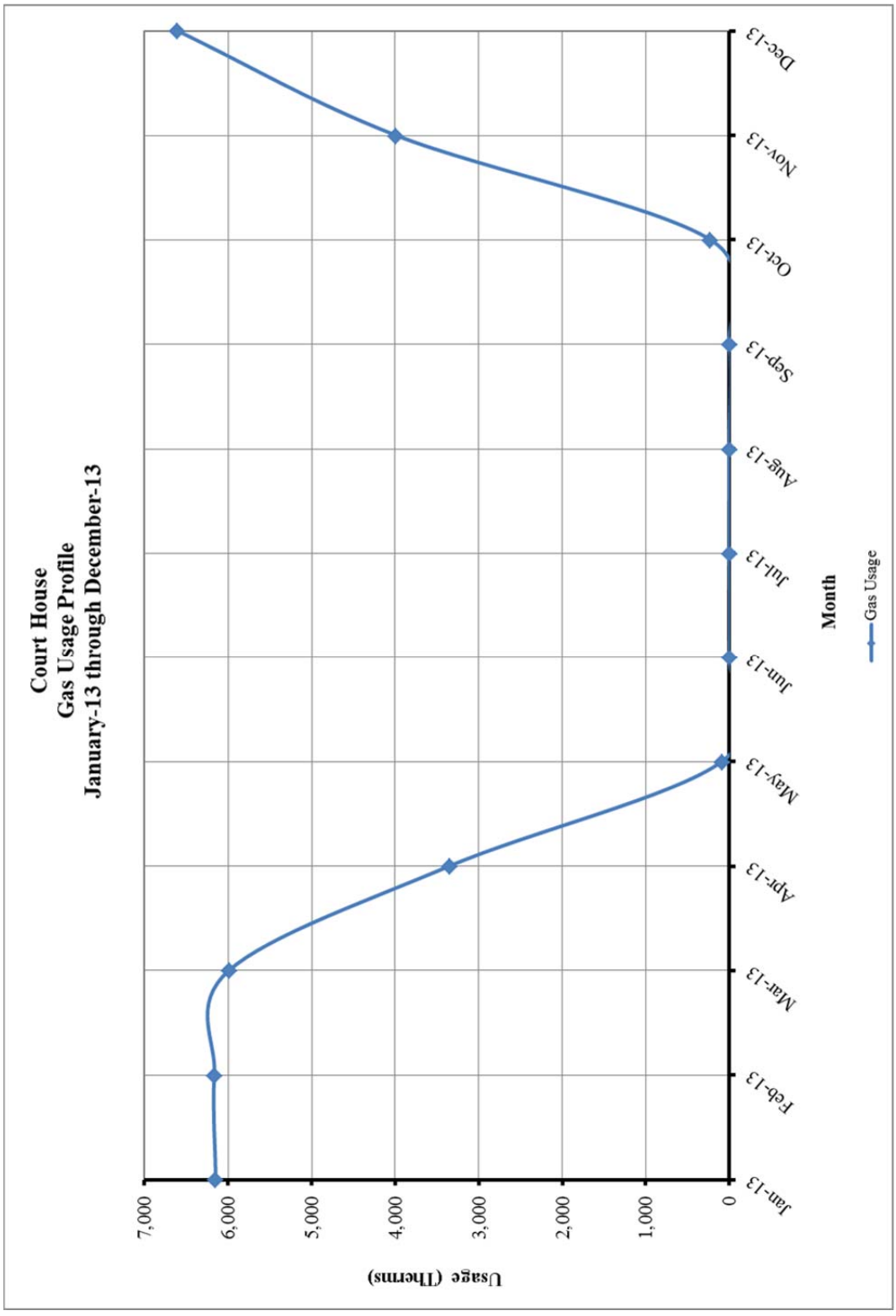


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: New Jersey Natural Gas		
Rate: GSL		
Meter No: 00851982		
Account No: 19-4510-0043-17		
Third Party Utility Provider: Hess		
TPS Meter No: -		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-13	6,147.74	$6,367.30
Feb-13	6,164.94	$6,379.69
Mar-13	5,989.57	$6,291.16
Apr-13	3,348.19	$3,888.05
May-13	90.46	$545.74
Jun-13	0.00	$450.40
Jul-13	0.00	$450.40
Aug-13	2.43	$452.83
Sep-13	0.00	$450.40
Oct-13	230.48	$684.35
Nov-13	3,996.73	$4,363.45
Dec-13	6,612.38	$7,262.97
TOTALS	**32,582.92**	**$37,586.74**
AVERAGE RATE:	**$1.15**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Court House is located at 100 Hooper Avenue in Toms River, New Jersey. The facility consists of three distinct sections that are connected the first being the East Court House, then Historic Court House, and finally West Court House totaling 108,800 square-feet. The East Court House was built in 1961 and is a four story facility comprised of courtrooms, offices, conference rooms, break areas, restrooms, storage rooms, and mechanical/utility rooms. The Historic Court House was built in 1851 and is a two story facility with a basement/crawl space and is comprised of offices, a multipurpose room, main courtroom, and judge's chambers. The West Courthouse was built in 1965 and is a three story facility, comprised of courtrooms, offices, conference rooms, public records rooms, and judge's chambers.

Occupancy Profile

The typical hours of operation for most of the facility are Monday through Friday between 7:00 am and 6:00 pm. There are approximately 40 plus employees that normally occupy the facility not including public visitors which varies.

Building Envelope

Exterior walls for the building are masonry brick faced with a concrete block construction the insulation is minimum throughout the building typical of the time periods each section was built. The windows throughout the facility are in varying states of condition, with the historic sections windows being in the worst shape. The windows are different in each section of the facility with the east and west sections consisting of dual pane windows aluminum frame that are either operable or fixed, and the historic section has single pane windows with wood frames, that were operable, however many appears to now be sealed shut. The roof consists of rubber built up roof with a white rubber roof on the east section, and black rubber roof on the west section. The historic roof consists of wood planking with a grey/white painted tar exterior covering with vapor barrier.

HVAC Systems

Court House East

The east section has a dedicated hot water boiler plant that consists of four natural gas fired condensing boilers manufactured by Aerco each with an input rating of 2,000,000 Btu/h and a nameplate efficiency of 88%, and condensing mode efficiencies above 90%. The heating water is distributed by pair of 7 ½ horsepower pumps constant volume, one of which operates as a standby.

The east section also has a dedicated chilled water plant that consists of a single water-cooled Carrier chiller. The chiller is rated at 200 tons of cooling capacity and is nearly 30 years old. The unit has an efficiency of 0.715 kW per ton and uses R-11 refrigerant. The chiller rejects condenser water to a single cell BAC cooling tower located on the roof. The tower has a single fan connected to two motors of different horsepower to limit power consumption for high and low loads. Chilled Water is circulated by two constant volume 15 horsepower Bell & Gossett

pumps, one of which operates as a standby. These pumps have a flow rating of 430 gallons per minute and 65 feet of head pressure. The condenser water is circulated by two constant volume 10 horsepower Armstrong pumps, one which operates as a standby. These pumps have a flow rating 480 gallons per minute and 50 feet of head pressure.

The east section has multiple air handlers, a single rooftop, and perimeter unit ventilators that condition spaces. Air handling units tagged HVAC 2 &3 are located in the roof penthouse and are both dual deck multi-zone units with the mixing dampers at the unit that supply air to the 2nd and 3rd floors. These units each have a hot deck with heating hot water, and a cold deck with chilled water, and each unit having a single 3 horsepower fan. There are two additional chilled water and hot water constant volume air handlers (AC#1, 2); and one split direct expansion cooling and hot water heating constant volume air hander (AC#6), which condition the courtrooms, offices, and common spaces. These units are all manufactured by Trane and are approaching the end of their useful lives.

Historic Court House

The Historic Courthouse is heated by a steam boiler plant located on the basement level of the facility. There are two Weil Mc-Lain sectional low pressure steam boilers with an input rating of 1,710,000 Btu/h and nameplate rated output capacity of 1,413,000 Btu/h. The boiler distributes steam at 10 to 15 psi, of which some is distributed to perimeter steam radiators and baseboard, and some is converted to hot water for air handlers. The heating hot water is distributed by two constant volume 2 horsepower Bell & Gossett Pumps. The pumps have a flow rating of 50 gallons per minute and 45 feet of head pressure.

The Historic Courthouse also has two air-cooled chiller located in the courthouse square that supply chilled water. The two chillers are manufactured by York and Trane and are rated at approximately 60 tons of cooling capacity each. The York unit has surpassed its useful life expectancy of 20 years and the Trane unit is currently 14 years old. Chilled water is distributed by two constant volume 7 ½ horsepower Bell & Gossett Pumps.

The air side systems in the historic section consist of perimeter radiation heating and five air handlers located in the attic. Four of the units (AHU-1 to 4) are located above the Multi-purpose room and judge's chambers and are manufactured by York. These units have chilled water and hot water heating coils and are constant volume. The final air handlers (AH#1) is located above the historic courtroom and is a Carrier unit with the heating and cooling coils downstream in the supply duct to the spaces.

Court House West

The west section is comprised of multiple systems with some of its heating coming from the Historic boiler plant. The west section does have a standalone hot water heating plant, and its air conditioning comes from split system direct expansion cooling units, and two rooftop units.

The hot water boiler plant is a single H.B. Smith 2500 Mills sectional cast iron boilers with an estimated input capacity of 900,000 Btu/hr and a nameplate IBR output capacity of 617,400

Btu/hr. The boiler appears to be well past its useful life expectancy. Heating water is circulated by a small fractional horsepower in-line Grundfos hot water pump.

The air conditioning in the west section consists of multiple system types including split systems, thru-wall units, rooftop units, and a self-contained unit ventilator. Areas with split systems and thru-wall units are typically heated by radiant heaters and cabinet heaters along perimeter walls. The split systems and thru-wall units vary in tonnage from 1 to 5 tons. The two rooftop units on the west roof are manufactured by Trane with capacities of approximately 5 and 2.5 tons and are equipped with electric duct heaters as supplemental heating for the spaces. Both of these units are well past their useful life expectancy.

Exhaust System

The East roof has down blast style exhaust air fans for general and toilet exhaust. The toilet rooms in the historic and west section have recessed ceiling fans in each restroom, which are switch operated.

HVAC System Controls

The entire East Courthouse is controlled through an Andover Building Automation System. The Andover system has a front end computer with onsite access only. The system has control graphics for all of the HVAC systems within the East Wing including the Aerco Boiler Plant and Carrier Water-Cooled Chiller Plant. The Historic section is controlled by standalone thermostats for the York air handlers and pneumatic thermostats that control the perimeter heating. The West Section is controlled by onboard unit controls and both programmable and non-programmable thermostats that control the air conditioning units.

Domestic Hot Water

The East Courthouse has a 500 gallon storage tank connected to a single Aerco KC-1000 series boiler for domestic hot water. The addition of a heat exchanger though, has shifted the load off the KC series boiler and onto the Benchmark boilers that are used for primary heating. Since the Benchmark boilers operate nearly year round and more efficiently, the KC series is now operated as a backup system.

The West and Historic Courthouse sections domestic hot water is served by a single A.O. Smith combination electric hot water heater and storage tank. The unit has an input rating of 12 kilowatts and 119 gallons of storage.

Lighting

Refer to the Investment Grade lighting Audit Appendix for a detailed list of the lighting throughout the facility and estimated operating hours per space.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade	$208,450	$13,880	15.0	-0.1%
ECM #2	Lighting Controls	$13,350	$1,291	10.3	45.1%
ECM #3	Vending Miser Controls	$1,000	$712	1.4	611.7%
ECM #4	Domestic Heater Upgrade	$23,700	$1,708	13.9	8.1%
ECM #5	Premium Efficiency Motors	$32,000	$1,287	24.9	-27.6%
ECM #6	Multi-Zone to VAV	$67,000	$3,529	19.0	-21.0%
ECM #7	Cooling Tower VFD Fan	$19,600	$650	30.2	-50.3%
ECM #8	Rooftop Unit Replacement	$47,770	$2,232	21.4	-29.9%
ECM #9	West Boiler Replacement	$52,688	$1,760	29.9	-16.5%
ECM #10	East Chiller Replacement	$231,800	$6,563	35.3	-29.2%
ECM #11	Central DDC	$300,000	$9,212	32.6	-53.9%
ECM #12	Window Replacement	$55,000	$1,057	52.0	-52.0%
ECM #13	Plug Load Management	$14,000	$1,097	12.8	17.5%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	24 kW Roof Array	$111,342	$8,329	13.4	12.2%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Lighting Upgrade	37.5	99,141	0
ECM #2	Lighting Controls	0.0	9,219	0
ECM #3	Vending Miser Controls	0.0	5,120	0
ECM #4	Domestic Heater Upgrade	0.0	17,490	-629
ECM #5	Premium Efficiency Motors	2.9	9,256	0
ECM #6	Multi-Zone to VAV	2.3	10,521	1,797
ECM #7	Cooling Tower VFD Fan	0.0	4,676	0
ECM #8	Rooftop Unit Replacement	3.4	16,056	0
ECM #9	West Boiler Replacement	0.0	0	1,530
ECM #10	East Chiller Replacement	20.8	46,880	0
ECM #11	Central DDC	0.0	46,192	2,428
ECM #12	Window Replacement	0.0	625	844
ECM #13	Plug Load Management	0.0	8,251	0
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	24 kW Roof Array	19.1	28,571	0

Table 3
ECM Emissions Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	GREENHOUSE GAS EMISSIONS REDUCTION		
		CO_2 EMISSIONS (LBS)	NO_X EMISSIONS (LBS)	SO_2 EMISSIONS (LBS)
ECM #1	Lighting Upgrade	150,694	278	644
ECM #2	Lighting Controls	14,013	26	60
ECM #3	Vending Miser Controls	7,782	14	33
ECM #4	Domestic Heater Upgrade	19,226	43	114
ECM #5	Premium Efficiency Motors	14,069	26	60
ECM #6	Multi-Zone to VAV	37,020	46	68
ECM #7	Cooling Tower VFD Fan	7,108	13	30
ECM #8	Rooftop Unit Replacement	24,405	45	104
ECM #9	West Boiler Replacement	17,901	14	0
ECM #10	East Chiller Replacement	71,258	131	305
ECM #11	Central DDC	98,619	152	300
ECM #12	Window Replacement	10,825	10	4
ECM #13	Plug Load Management	12,542	23	54
Notes:	A. Emissions Reduction based on NJCEP published factors for electric & gas.			

Table 4
Facility Project Summary

FACILITY PROJECT SUMMARY TABLE					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade	$13,880	$260,000	$51,550	$208,450	15.0
Lighting Controls	$1,291	$15,000	$1,650	$13,350	10.3
Vending Miser Controls	$712	$1,000	$0	$1,000	1.4
Domestic Heater Upgrade	$1,708	$24,000	$300	$23,700	13.9
Premium Efficiency Motors	$1,287	$32,000	$0	$32,000	24.9
Multi-Zone to VAV	$3,529	$67,000	$0	$67,000	19.0
Cooling Tower VFD Fan	$650	$20,500	$900	$19,600	30.2
Rooftop Unit Replacement	$2,232	$48,000	$230	$47,770	21.4
West Boiler Replacement	$1,760	$54,000	$1,313	$52,688	29.9
East Chiller Replacement	$6,563	$235,000	$3,200	$231,800	35.3
Central DDC	$9,212	$300,000	$0	$300,000	32.6
Window Replacement	$1,057	$55,000	$0	$55,000	52.0
Plug Load Management	$1,097	$14,000	$0	$14,000	12.8
Total Project	**$44,978**	**$1,125,500**	**$59,143**	**$1,066,358**	**23.7**

Note the measure totals in this table do not take into account interactive effects of measures; see Method of Analysis Section III in Executive Report for further explanation.

This project does not qualify for additional incentives through the Pay for Performance Program; please see the Installation Funding Options section for additional program options. Note the project savings outlined above is only slightly below qualification for the program, further evaluation of measure may deem qualification for the program.

ECM #1: Lighting Upgrade – General

Description:

The interior lighting throughout the Court House Building varies widely including T12 fluorescent, T8 fluorescent, incandescent, compact fluorescent and metal halide. The replacement of these fixtures with new LED style lamps and fixtures can greatly increase the energy efficiency and fixture life expectancy.

This ECM includes retrofitting the interior lighting with new LED type fixtures, screw in lamps, and exterior lights. It is recommended the County consult with a professional engineer prior to retrofitting fixtures to ensure code required minimum light levels will be met. Additional savings may also be able to be found if it is discovered fixture quantities can be reduced. Furthermore the County should note this retrofit recommends entire fixture replacement; comparable savings at a reduced cost could be realized through the retrofitting the fixtures in good condition with equivalent LED lamps in lieu of total replacement.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	37.5
Electric Usage Savings (kWh)	99,141
Electric Cost Savings ($)	$13,880

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$260,000
NJ Smart Start Equipment Incentive ($):	$51,550
Net Installation Cost ($):	$208,450
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$13,880
Total Yearly Savings ($/Yr):	$13,880
Estimated ECM Lifetime (Yr):	15
Simple Payback	15.0
Simple Lifetime ROI	-0.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$208,200
Internal Rate of Return (IRR)	0%
Net Present Value (NPV)	($42,751.46)

ECM #2: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Court House are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for offices, small conference rooms, and restrooms. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = (\%\ \text{Savings} \times \text{Controlled Light Energy}\ (\text{kWh/Yr}))$$

$$\text{Savings.} = \text{Energy Savings}\,(\text{kWh}) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	9,219
Electric Cost Savings ($)	$1,291

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$15,000
NJ Smart Start Equipment Incentive ($):	$1,650
Net Installation Cost ($):	$13,350
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,291
Total Yearly Savings ($/Yr):	$1,291
Estimated ECM Lifetime (Yr):	15
Simple Payback	10.3
Simple Lifetime ROI	45.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$19,365
Internal Rate of Return (IRR)	5%
Net Present Value (NPV)	$2,061.87

ECM #3: Vending Miser Controls

Description:

The Court House has vending machined located in the corridors near lobby waiting areas. The installation of the Vending Miser system will help reduce the operating hours of vending machines.

Cold beverage machines regularly operate inefficiently trying to maintain a constant cool temperature within the machine and snack machines with no cooling usually have lights that operate 24/7. The VendingMiser® system incorporates innovative energy-saving technology into a small plug-and-play device that in conjunction with a passive infrared sensor regulate the operation of the cold beverage and snack machines based on occupancy and room temperature. This ECM approximates the installation of two (2) for the cold beverage machines and two (2) for the snack machines. (Note: There are currently no NJ OCE incentives for vending miser controls.)

Energy Savings Calculations:

Savings calculations are based on manufacturer's analysis tool and building operating characteristics.

Cold Drink and Snack Vending Machine Energy Conservation Project

Energy Analysis Prepared For:

Court House

www.VendingMiserStore.com

Input Variables	
Energy Costs ($0.000 per kwh)	$0.139
Facility Occupied Hours per Week	60
Number of Cold Drink Vending Machines	2
Number of Uncooled Snack Machines	2
Power Requirements of Cold Drink Machine (avg watts	427
Power Requirements of Snack Machine (avg watts)	100
VendingMiser Sale Price (for cold drink machines)	$250.00
OfficeMiser Sale Price (for snack machines)	$150.00

Savings Analysis

	Before	After	
Cold Drink Machines	$1,040.58	$485.03	Cost of Operation
	7,486	3,489	kWh
		53%	% Energy Savings
Snack Machines	$242.86	$86.74	Cost of Operation
	1,747	624	kWh
		64%	% Energy Savings

Project Summary

Present kWh	Projected kWh	kWh Savings per Year
9,233	4,113	5,120

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$1,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$1,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$712
Total Yearly Savings ($/Yr):	$712
Estimated ECM Lifetime (Yr):	10
Simple Payback	1.4
Simple Lifetime ROI	611.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$7,117
Internal Rate of Return (IRR)	71%
Net Present Value (NPV)	$5,070.69

ECM #4: High Efficiency Gas Hot Water Heater

Description:

The Court House Historic and West sections have a single electric hot water heater located in the boiler room. The current unit is a four element heater with a storage capacity of 119 gallons and total electric input of 12 kilowatts. The unit is only 5 years, but could be replaced with a much more efficient and cost effective natural gas fired domestic boiler.

This ECM will replace the domestic water heater with a Natural Gas fired 93% thermal efficient Bradford White EF series 60 gallon 150 MBH heater. The natural gas line will need to be extended to the heater, and venting can be extended from the heater out the side wall. (Before proceeding with installation of aforementioned system, Concord Engineering suggests consulting an engineer to evaluate the system fully.)

Energy Savings Calculations:

Energy Density for "Public Assembly" type building = 0.9 kBtu / SF / year

$$\text{DHW Heat Usage (kBtu)} = \text{Energy Density} \left(\frac{\frac{\text{kBtu}}{\text{yr}}}{\text{SF}} \right) \times \text{Building Area (SF)}$$

$$\text{DHW Total Usage} = \frac{\text{DHW Heat Usage (Btu)}}{\text{Heating Eff (\%)} \times \text{Fuel Heat Value} \left(\frac{\text{Btu}}{\text{Fuel Unit}} \right)}$$

$$\text{Energy Cost} = \text{Heating Fuel Usage (Fuel Units)} \times \text{Avg. Fuel Cost} \left(\frac{\$}{\text{Fuel Unit}} \right)$$

DOM. HOT WATER HEATER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Electric Hot Water Heater	High Efficiency Heater	
Building Type	Public Assembly		
Building Square-foot	65,000	65,000	
Domestic Water Usage, kBtu	58,500.00	58,500.00	
DHW Heating Fuel Type	Electric	Gas	
Heating Efficiency	98%	93%	-5%
Total Usage (kBTU)	59,694	62,903	-3,209
Electric Cost ($/kWh)	$ 0.139	$ -	
Nat Gas Cost ($/Therm)	$ -	$ 1.150	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	17,490	0	17,490
Natural Gas Usage (Therms)	0	629	-629
Energy Cost ($)	$2,431	$723	$1,708
COMMENTS:			

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$24,000
NJ Smart Start Equipment Incentive ($):	$300
Net Installation Cost ($):	$23,700
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,708
Total Yearly Savings ($/Yr):	$1,708
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.9
Simple Lifetime ROI	8.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$25,620
Internal Rate of Return (IRR)	1%
Net Present Value (NPV)	($3,310.01)

ECM #5: Premium Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving the pumps and fans in some of the HVAC equipment are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors.

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
HWP-5	East Hot Water Pump	7.5	3,600	84.0%	91.0%
HWP-6	East Hot Water Pump	7.5	3,600	84.0%	91.0%
CWP-1	East Condenser Water Pump	10	3,600	87.0%	91.7%
CWP-2	East Condenser Water Pump	10	3,600	91.7%	91.7%
CHWP-1	East Chilled Water Pump	15	2,745	89.5%	91.7%
CHWP-2	East Chilled Water Pump	15	2,745	89.5%	91.7%
HWP-1	Historic Hot Water Pump	2	1,696	84.0%	86.5%
HWP-2	Historic Hot Water Pump	2	1,696	84.0%	86.5%
HVAC-2	Supply Fan	3	2,745	81.5%	89.5%
HVAC-3	Supply Fan	3	2,745	81.5%	89.5%
AC-2	Supply Fan	7.5	3,391	86.5%	91.0%

Energy Savings Calculations:

$$\text{Electric Usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate} \left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	**QTY**	**MOTOR HP**	**LOAD FACTOR**	**EXISTING EFFICIENCY**	**PROPOSED EFFICIENCY**	**POWER SAVINGS kW**	**ENERGY SAVINGS kWH**	**COST SAVINGS**
HWP-5	1	7.5	75%	84.0%	91.0%	0.38	1,391	$193
HWP-6	1	7.5	75%	84.0%	91.0%	0.38	1,391	$193
CWP-1	1	10	75%	87.0%	91.7%	0.33	1,193	$166
CWP-2	1	10	75%	91.7%	91.7%	0.00	0	$0
CHWP-1	1	15	75%	89.5%	91.7%	0.22	621	$86
CHWP-2	1	15	75%	89.5%	91.7%	0.22	621	$86
HWP-1	1	2	75%	84.0%	86.5%	0.04	66	$9
HWP-2	1	2	75%	84.0%	86.5%	0.04	66	$9
HVAC-2	1	3	75%	81.5%	89.5%	0.18	508	$71
HVAC-3	1	3	75%	81.5%	89.5%	0.18	508	$71
AC-2	2	7.5	75%	86.5%	91.0%	0.48	1,636	$227
TOTAL						**2.5**	**7,999**	**$1,112**

There are no longer incentives available through NJ Smart Start for premium efficiency motors.

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$32,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$32,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,287
Total Yearly Savings ($/Yr):	$1,287
Estimated ECM Lifetime (Yr):	18
Simple Payback	24.9
Simple Lifetime ROI	-27.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$23,166
Internal Rate of Return (IRR)	-3%
Net Present Value (NPV)	($14,299.23)

ECM #6: Multi-Zone to VAV

Description:

The air handlers in the roof penthouse of Court House East (HVAC-2 & 3) are multi-zone units with constant volume fans. The units have zone dampers located off the hot and cold decks of the units in the penthouse prior to the individual zone distribution. Based on field observations it appeared some of the damper linkages were in working order, however we recommend verifying functionality along with implementation of this ECM. By converting the current system over to a variable air volume system utilizing the existing zone dampers to modulate airflow into the space considerable fan power and conditioning savings could be realized.

This ECM would install a variable frequency drive controller, inverter duty rated motor (assuming they get installed through the premium efficiency motor ECM), and duct mounted static pressure sensor. The control sequences for the units would also likely have to be modified to account for reducing the air flow in spaces with satisfied loads. (Recommend functional testing on zone dampers and thermostats.)

Energy Savings Calculations:

Energy Savings were calculated utilizing the New Jersey Board of Public Utilities Protocols to Measure Resource Savings.

$$\text{Energy Savings (kWh)} = 0.746 \times \text{HP} \times \text{HRS} \times (\text{ESF}/\eta_{\text{motor}})$$

$$\text{Demand Savings (kW)} = 0.746 \times \text{HP} \times (\text{DSF}/\eta_{\text{motor}})$$

$$\text{Energy Savings Factor (ESF)} = 0.475 \text{ (Airfoil/Backward Inclined Fans)}$$

$$\text{Demand Savings Factor (DSF)} = 0.448 \text{ (Airfoil/Backward Inclined Fans)}$$

VARIABLE SPEED DRIVE SAVINGS CALCULATIONS									
EQMT ID	QTY	FUNCTION	MOTOR HP	HOURS OF OPERATION	PROPOSED EFFICIENCY	INSTALL VFD	DEMAND SAVINGS (KW)	ENERGY SAVINGS (KWH)	ENERGY COST SAVINGS
HVAC-1	1	Supply Fan	3	3,500	86.5%	Yes	1.2	4,301	$598
HVAC-2	1	Supply Fan	3	3,500	86.5%	Yes	1.2	4,301	$598
TOTAL	2						2.3	8,603	$1,196

NJ Smart Start Incentives for Variable Frequency Drives are available based on motor horsepower.

$$\$ \text{ Incentive} = \$155 \times \text{Horsepower (5 to} < 10 \text{ HP)}$$
$$\$ \text{ Incentive} = \$120 \times \text{Horsepower (10 to} < 20 \text{ HP)}$$
$$\$ \text{ Incentive} = \$65 \times \text{Horsepower (20} + \text{ HP)}$$

Cooling Savings (kWh)

$$= \text{Capacity (MBH)} \times 80\% \text{ (Oversize Factor)} \times 24 \text{ hrs} \times \text{CDD} \times \text{Adj. Factor} \times \frac{1}{(Design\ OA\ Temp - Base\ Temp)} \times \frac{1}{EER}$$

Heating Savings (therm)

$$= \text{Capacity (MBH)} \times 80\% \text{ (Oversize Factor)} \times 24 \text{ hrs} \times \text{HDD} \times \text{Adj. Factor} \times \frac{1}{(Base\ Temp - Design\ OA\ Temp)} \times \frac{1}{\%\ Eff} \times \frac{1\ therm}{100\ kBtu}$$

VAV SYSTEM SAVINGS CALCULATIONS

EQMT ID	CFM	CLG TONS	HTG MBH	CDD (65F)	HDD (65F)	CLG EER	HTG EFF	ADJ. FACTOR	ADJ. FACTOR VAV
HVAC-1	5000	15	500	1135	5217	16	88%	0.63	0.54
HVAC-2	5000	15	500	1135	5217	16	88%	0.63	0.54

		EXISTING		PROPOSED		SAVINGS		
EQMT ID		ELECTRIC KWH	GAS THERM	ELECTRIC KWH	GAS THERM	ELECTRIC KWH	GAS THERM	UTILITY COST
HVAC-1		6,715	6,290	5,756	5,392	959	899	$1,167
HVAC-1		6,715	6,290	5,756	5,392	959	899	$1,167
		13,431	12,581	11,512	10,783	1,919	1,797	$2,334

ENERGY SAVINGS SUMMARY	
Description	**Value**
Electric Demand (kW)	2.3
Electric Usage (kWh)	10,521
Natural Gas Usage (therm)	1,797
Energy Cost ($)	$3,529

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$67,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$67,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$3,529
Total Yearly Savings ($/Yr):	$3,529
Estimated ECM Lifetime (Yr):	15
Simple Payback	19.0
Simple Lifetime ROI	-21.0%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$52,935
Internal Rate of Return (IRR)	-3%
Net Present Value (NPV)	($24,871.03)

ECM #7: Install VFD on Cooling Tower Fan

Description:

The BAC cooling tower on the Court House East Roof currently has an estimated high load stage 15 horsepower and low load stage 5 horsepower motor. While the current dual motor configuration allows for reduced consumption during off load hours additional energy savings could be realized through installing a variable frequency drive and a single motor. This would allow for further turndown of the fan along with reducing the maintenance associated with maintaining two motors with belts and pulleys. The installation of a VFD will allow the tower fan to modulate based on the required amount airflow needed to maintain the necessary condenser water temperature for the chiller.

This ECM includes the installation of a variable frequency drive and inverter duty premium efficiency motor on the tower fan along with the required tower controls to modulate the fan speed.

Energy Savings Calculations:

Load Factor = 75% (without VFD)

$$\text{Energy Consumption (kWh)} = \text{Motor HP} \times 0.746\frac{\text{kW}}{\text{HP}} \times \text{Hours of operation (Hr)} \times \frac{1}{\eta_{\text{motor}}}$$

$$\text{Total Energy Consumption (kWh)} = \sum \text{Energy Consumption of Each Motor}$$

$$\text{Energy Cost (\$)} = \text{Total Comsumption(kWh)} \times \text{Average Cost of Electric} \left(\frac{\$}{\text{kWh}}\right)$$

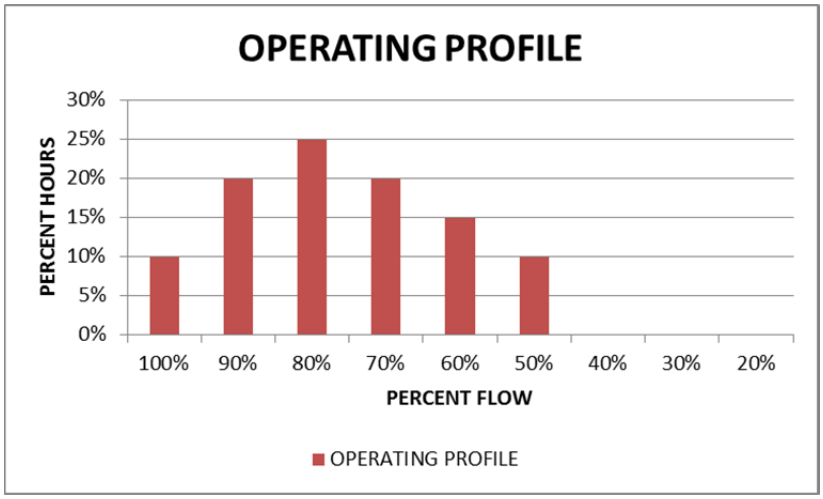
Affinity Laws are used in order to calculate energy savings by calculating the reduced power consumption requirement based a reduction in flow. Affinity laws, are as following:

Q = Flow, n = RPM, p = total pressure

$$\frac{Q_2}{Q_1} = \frac{n_2}{n_1} \qquad \frac{p_2}{p_1} = \left(\frac{n_2}{n_1}\right)^2 \qquad \frac{HP_2}{HP_1} = \left(\frac{n_2}{n_1}\right)^3$$

COOLING TOWER FAN VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Constant Fan	VFD Fan	
Control	On/Off	VFD	-
Quantiy of Fans	1	1	
Motor Nameplate HP (High Stage)	15.0	15.0	-
Motor Efficiency (%)	91.0%	93.0%	2.0%
Motor Nameplate HP (Low Stage)	5.0	-	
Motor Efficiency (%)	87.5%	-	
Operating Hrs	3400	3400	-
Percent Hours at High Stage	60.0%	-	
Load Factor	75.0%	75.0%	
Elec Cost ($/kWh)	$0.139	$0.139	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	24,611	19,935	4,676
Electric Energy Cost ($)	$3,421	$2,771	$650
COMMENTS:	Existing Motor Horsepowers are Estimated		

Estimated Operating Profile with VFD



Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$20,500
NJ Smart Start Equipment Incentive ($):	$900
Net Installation Cost ($):	$19,600
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$650
Total Yearly Savings ($/Yr):	$650
Estimated ECM Lifetime (Yr):	15
Simple Payback	30.2
Simple Lifetime ROI	-50.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$9,750
Internal Rate of Return (IRR)	-8%
Net Present Value (NPV)	($11,840.34)

ECM #8: West Rooftop Unit Replacement

Description:

The Court House West has two rooftop units that are well past their useful life expectancy. One of these units is equipped with an electric heating coil and the other is cooling only. By replacing the electric cooling and heating unit with a heat pump significant savings could be realized on both the heating and cooling energy of the unit. The cooling only unit would be a one for one replacement with a new more efficient unit.

This ECM would replace the existing two (2) rooftop units with one new heat pump roof top units with backup electric heat and economizer controls and one air conditioning only DX rooftop unit. The Trane WSC and 4TCY series were the basis of design for this ECM. It is recommended to fully evaluate the capacity needed for all new systems prior to moving forward with this ECM.

Energy Savings Calculations:

Heating Usage

$$\text{Usage (kBtu)} = \text{Capacity} \times 0.8 \times 24 \text{ hrs} \times \text{HDD} \times \frac{1}{(65-13)\text{F}}$$

$$\text{Fuel Usage} = \text{Usage (kBtu)} \times \frac{1}{\text{Sys \% Eff}} \times \text{Fuel Conversion Factor}$$

$$\text{Heat Pump Usage (kWh)} = \text{Capacity} \left(\frac{\text{Btu}}{\text{h}}\right) \times 0.8 \times 24 \text{ hrs} \times \text{HDD} \times \frac{1}{(65-13)\text{F}} \times \frac{1}{COP} \times \frac{1}{3412}$$

HDD for Heat Pump Usage is calculation based on operation between 40 to 65 degrees Fahrenheit. Heating operation below 40 degrees Fahrenheit is performed by electric backup. Heating Degree Days were adjusted for use type.

Cooling Usage

$$Usage\ (kWh) = \frac{Capacity\ (\frac{Btu}{h})}{1000} \times EFLH \times \frac{1}{EER}$$

RTU-1

ROOFTOP HEATPUMP REPLACEMENT			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Quantity of Units	1	1	
Unit Cooling Capacity (Btu/h)	60,000	60,000	
Unit Electric Heating Capacity (kW)	14.4	14.4	
HEATING SAVINGS CALCULATION			
Unit Capacity (Btu/h)	49,000	49,000	
Coefficient of Performance (COP)	-	3.50	
Heating Degree Days (65 F)	3,287	3,287	
Percent HDD less than 40 F	0%	17%	
Percent HDD between 40 F to 65 F	0%	83%	
Heating Stage 1 [Heat Pump] (kWh)	0	4,132	
Heating Stage 2 [Electric Backup] (kWh)	17,475	2,974	
Electric Usage (kWh)	17,475	7,106	10,369
COOLING SAVINGS CALCULATION			
Cooling Efficiency (EER)	7.0	11.26	
Cooling Equivalent Full Load Hours	1,131	1,131	
Electric Usage (kWh)	9,694	6,027	3,668
Electric Cost ($/kWh)	$0.1390	$0.1390	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Demand (kW)	5.74	3.57	2.17
Electric Usage (kWh)	27,169	13,133	14,036
Energy Cost ($)	$3,777	$1,825	$1,951
COMMENTS:	HP Operation Above 40F for Heating, Below 40 F for Backup Electric Heat. HDD Adjusted for Use Type		

RTU-2

ROOFTOP AC UNIT REPLACEMENT			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Quantity of Units	1	1	
Unit Cooling Capacity (Btu/h)	30,000	30,000	
COOLING SAVINGS CALCULATION			
Cooling Efficiency (EER)	7	12	
Cooling Equivalent Full Load Hours	1,131	1,131	
Electric Usage (kWh)	4,847	2,828	2,020
Electric Cost ($/kWh)	$0.1390	$0.1390	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Demand (kW)	2.87	1.68	1.20
Electric Usage (kWh)	4,847	2,828	2,020
Energy Cost ($)	$674	$393	$281
COMMENTS:	HP Operation Above 40F for Heating, Below 40 F for Backup Electric Heat. HDD Adjusted for Use Type		

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$48,000
NJ Smart Start Equipment Incentive ($):	$230
Net Installation Cost ($):	$47,770
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,232
Total Yearly Savings ($/Yr):	$2,232
Estimated ECM Lifetime (Yr):	15
Simple Payback	21.4
Simple Lifetime ROI	-29.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$33,480
Internal Rate of Return (IRR)	-4%
Net Present Value (NPV)	($21,124.53)

ECM #9: Boiler Replacement

Description:

The hot water boiler located in the West section basement is well past its useful life expectancy and could be replaced with a much more efficient hot water condensing boiler. The existing boiler has an estimated input rating of 900 MBH and an overall efficiency of 65%.

This ECM would replace the 900 MBH input boiler with a new Aerco Benchmark series boiler rated for 750 MBH. We recommend the County consult with a professional engineer prior to final selection and engineering of the boiler t to investigate the potential to downsize the boiler based on capacity requirements in the West section.

Energy Savings Calculations / Results:

Energy Savings were calculated utilizing the New Jersey Board of Public Utilities Protocols to Measure Resource Savings dated July 2011.

$$\text{Fuel Savings} = \text{Natural Gas Usage} \times \left(1 - \frac{\text{Existing Efficiency}}{\text{Proposed Efficiency}}\right)$$

NATURAL GAS USAGE BREAKDOWN	
Description	**therm**
Utility Bill Usage	32,582.9
Domestic Hot Water	839.0
East Aerco Boiler Plant	18,082.7
Steam Boiler Plant	8,152.9
West HW Plant	5,508.3

CONDENSING BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Cast Iron Boiler	New Condensing Boiler	
Existing Nat Gas (Therms)	5,508		
Boiler Efficiency (%)	65.0%	90.0%	25%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	358	358	
Gas Cost ($/Therm)	$1.15	$1.15	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	5,508	3,978	1,530
Energy Cost ($)	$6,335	$4,575	$1,760
COMMENTS:	Boiler Efficiency Based on age of boiler		

Energy Savings Summary:

ECM #9 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$54,000
NJ Smart Start Equipment Incentive ($):	$1,313
Net Installation Cost ($):	$52,688
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,760
Total Yearly Savings ($/Yr):	$1,760
Estimated ECM Lifetime (Yr):	25
Simple Payback	29.9
Simple Lifetime ROI	-16.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$44,000
Internal Rate of Return (IRR)	-1%
Net Present Value (NPV)	($22,040.36)

ECM #10: Chiller Replacement

Description:

The Court House East section has a single 200 ton water-cooled Carrier Chiller that is past its useful life expectancy. The existing chiller has an estimated efficiency of 0.715 kilowatts per ton at full load.

This ECM would install a new high efficiency water-cooled chiller with variable frequency drive and minimum efficiency rating of 0.56 full load kilowatts per ton, and part load value of 0.46 kilowatts per ton.

Energy Savings Calculations:

$$\text{Electric Usage} = \text{Capacity (tons)} \times \frac{12{,}000\ \text{Btu}}{1000\ \text{W}} \times \frac{1}{\text{EER}} \times \text{Operating Hours}$$

$$\text{Demand Savings} = \text{Capacity (tons)} \times \left(\frac{1}{\text{EER}_{\text{Old}}} - \frac{1}{\text{EER}_{\text{New}}}\right) \times 67\%\ \text{Capacity Factor}$$

$$\text{Energy Cost} = \text{Electric Usage (kWh)} \times \text{Rate} \left(\frac{\$}{\text{kWh}}\right)$$

CHILLER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Water Cooled Chillers	High Efficiency Chiller	
Operating Capacity (Tons)	200.0	200.0	
Chiller Efficiency (EER)	16.8	21.4	
Full Load Cooling Hrs (Est.)	800	800	
Cooling Energy (kWh)	114,400	89,600	
Chiller Operating Hours (Year Round)	2,000	2,000	
Chiller Part Load Hours Est.	1,200	1,200	
Chiller IPLV (EER)	17.4	26.1	
Chiller Part Load %	40.0%	40.0%	
Part Load Cooling Energy (kWh)	66,240	44,160	
Elec Cost ($/kWh)	0.140	0.140	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Demand (KW)	95.8	75.0	20.8
Electric Energy (kWh)	180,640	133,760	46,880
Electric Energy Cost ($)	$25,290	$18,726	$6,563
COMMENTS:			

Energy Savings Summary:

ECM #10 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$235,000
NJ Smart Start Equipment Incentive ($):	$3,200
Net Installation Cost ($):	$231,800
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$6,563
Total Yearly Savings ($/Yr):	$6,563
Estimated ECM Lifetime (Yr):	25
Simple Payback	35.3
Simple Lifetime ROI	-29.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$164,075
Internal Rate of Return (IRR)	-2%
Net Present Value (NPV)	($117,517.51)

ECM #11: Digital Energy Management System (DDC EMS)

Description:

This ECM would upgrade the existing Andover Control System to a web based system and expand the scheduling and control capability to improve system operating efficiency. The system should also be expanded to include the Historic Court House Air Handling Units along with the new Steam Boiler Plant, and circulating pumps.

The Central DDC system installation has the potential to provide significant savings by controlling the HVAC systems as a whole and provide operating schedules and features such as space averaging, night set-back, temperature override control, etc. The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the referenced report:

- Energy Management and Control System Savings: 5%-15%.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 7.5% of the electricity and 7.5% for the gas utility in this building.

The basis for the DDC system expansion is the Andover Energy Management System or similar. (Note: There are currently no NJ OCE incentives for HVAC controls upgrades.)

Energy Savings Calculations:

Energy savings for each utility is calculated with the equation below.

$$\text{Energy Savings (Utility)} = \text{Current Energy Consumption} \times \text{Estimated Savings, \%}$$

Following table summarizes energy savings for this facility via implementation of an Energy Management System:

CONTROLS SAVINGS CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
HVAC Usage Electric (kBtu)	2,101,444	1,943,836	157,608
HVAC Usage Gas (kBtu)	3,236,822	2,994,060	242,762
Savings Percentage	-	7.5%	
Electric Site Conversion (kWh/kBtu)	3.412	3.412	
Gas Site Conversion (Therm/kBtu)	100.0	100.0	
Electric Cost ($/kWh)	$0.139	$0.139	
Gas Cost ($/Gallon)	$1.150	$1.150	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	615,898	569,706	46,192
Gas Usage (Therms)	32,368	29,941	2,428
Energy Cost ($)	$122,833	$113,621	$9,212
COMMENTS:			

Energy Savings Summary:

ECM #11 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$300,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$300,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$9,212
Total Yearly Savings ($/Yr):	$9,212
Estimated ECM Lifetime (Yr):	15
Simple Payback	32.6
Simple Lifetime ROI	-53.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$138,180
Internal Rate of Return (IRR)	-8%
Net Present Value (NPV)	($190,027.74)

ECM #12: Window Replacement

Description:

The Historic Courthouse section has old wood frame single pane windows that are in poor condition. It is estimated there is approximately 840 square-foot of window area that would need to be replaced.

Older inefficient windows can account for significant energy use through leakage heat loss and conductive heat loss. The age and condition of the windows contribute to the leakage rate of the building. The single pane construction allows higher thermal (conductive) energy loss. These factors lead to increased energy use in the heating season. The heating loss due to single pane glass is combined with heat loss due to poor seals at each operable window. New double pane windows with low E glazing offer a substantial improvement in thermal performance throughout the year.

This ECM includes the replacement of all windows in the Historic section with double pane windows with low emissivity glass and wood frames. The proposed windows include reduced outside air leakage. In addition the double pane structure will significantly increase the insulation value compared to the existing single pane window structure.

The basis for this ECM is an ASHRAE 90.1-2007 equivalent window. The windows will be replaced throughout the building. (Concord Engineering recommends the county coordinate this effort with an architect to comply with historical building codes and further refine the scope.)

Energy Savings Calculations:

Thermal Loss values were calculated for each month based on the average monthly temperature obtained for 2012/2013. The cooling period used was May to September, and heating period used was October to April.

$$\text{Thermal Loss Savings (kBtu)} = (U_E - U_P) \times \text{Window Area} \times (T_{\text{Indoor}} - T_{\text{Avg Outdoor}}) \times \frac{\text{Hours}}{\text{Month}} \times \frac{1\text{ kBtu}}{1{,}000\text{ Btu}}$$

$$\text{Heating Savings (Therm)} = \text{Thermal Loss Savings (Heating)} \times \frac{1}{\text{Efficiency}} \times \frac{1\text{ Therm}}{100\text{ kBtu}}$$

$$\text{Cooling Savings (kWh)} = \text{Thermal Loss Savings (Cooling)} \times \frac{1}{\text{EER}}$$

WINDOW REPLACEMENT CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Description:	Existing Single Pane Windows	Double Pane Low-E Windows	
Window (SF)	840	840	
U-Value (BTU/HR/SF*°F)	1.0	0.45	0.55
Infiltration Rate (CFM/SF)	1.0	0.4	0.60
Indoor Temperature Cooling (°F)	72	72	
Indoor Temperature Heating (°F)	70	70	
Average Thermal Loss Rate Heating (BTU/HR)	23,880	10,746	13,134
Average Thermal Loss Rate Cooling (BTU/HR)	2,856	1,285	1,571
Heating Degree Days (65°F)	5217	5217	
Cooling Degree Days (65°F)	1135	1135	
Thermal Losses Heating (kBtu)	122,714	55,221	67,493
Thermal Losses Cooling (kBtu)	10,221	4,600	5,622
Heating System Efficiency (%)	80.0%	80.0%	
Cooling System Efficiency (EER)	9.0	9.0	
Natural Gas Cost ($/Therm)	$1.15	$1.15	-
Electric Cost ($/kWh)	$0.139	$0.139	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	1,136	511	625
Natural Gas Usage (Therm)	1,534	690	844
Energy Cost Savings ($)	$1,922	$865	$1,057
Comments:	1. Proposed window U-value Based on ASHRAE 90.1 - 2007 2. Savings Based on Avg. Monthly Temperature for 2012/2013		

Energy Savings Summary:

ECM #12 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$55,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$55,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,057
Total Yearly Savings ($/Yr):	$1,057
Estimated ECM Lifetime (Yr):	25
Simple Payback	52.0
Simple Lifetime ROI	-52.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$26,425
Internal Rate of Return (IRR)	-5%
Net Present Value (NPV)	($36,594.30)

ECM #13: Plug Load Management

Description:

The Court House has many types of plug in type equipment from computer monitors, copiers/printers, water fountains, window and thru-wall air conditioning units, and other office equipment. As technology continues to advance and be integrated into society and the work environment, the devices in most instances require electrical power either a battery or power outlet. The increase in use of these devices is contributing vastly to the increase in electric usage at facilities and according to a study performed by the California Energy Commission can account for more than 20% of electricity use. In most instances these devices are left plugged in and sometimes on continuously whether occupants are present or not leading to a significant amount of wasted energy. By managing these loads with intelligent outlet receptacles facility and energy management staff can reduce the consumption of these devices and better control energy waste.

The installation of a plug load management system with wireless controlled outlets will enable facility staff and energy managers to control the power draw of these systems during unoccupied periods. For cost estimating purposes a total of 100 outlets would be controlled by this system, further refinement of this number should be performed before installation. The basis of this measure is a “Bert” plug load management system with a network interface control system.

Energy Savings Calculations:

Data published by the DOE’s Energy and Information Administration Commercial Buildings Consumption Survey states energy use breakouts for various types of buildings. This survey data was used to estimate the building energy consumption associated with Office Type Equipment.

Savings are based on a ten (10%) percent reduction of the electric usage associated with interior equipment usage.

PLUG LOAD MANAGEMENT SAVINGS CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Interior Equipment Usage Electric (kBtu)	281,539	253,385	28,154
Interior Equipment Usage Gas (kBtu)	0	0	0
Savings Percentage	-	10.0%	
Electric Site Conversion (kWh/kBtu)	3.412	3.412	
Gas Site Conversion (Therm/kBtu)	100.0	100.0	
Electric Cost ($/kWh)	$0.139	$0.139	
Gas Cost ($/Gallon)	$1.150	$1.150	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	82,514	74,263	8,251
Gas Usage (Therms)	0	0	0
Energy Cost ($)	$11,470	$10,323	$1,147
COMMENTS:			

Energy Savings Summary:

ECM #13 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$14,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$14,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,097
Total Yearly Savings ($/Yr):	$1,097
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.8
Simple Lifetime ROI	17.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$16,455
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($904.09)

REM #1: 24 kW Solar System

Description:

The Court House has a small amount of available roof space that can be utilized for a small 24 kilowatt solar array. The array will produce approximately 28,571 kilowatt-hours annually that will reduce the overall electric usage of the facility by 1.46%. The owner should consult a structural engineer prior to installing any solar array to insure the roof can accommodate the additional weight.

Energy Savings Calculations:

See **Renewable / Distributed Energy Measures Calculations Appendix** for detailed financial summary and proposed solar layout areas. Financial results in table below are based on 100% financing of the system over a fifteen year period.

Energy Savings Summary:

REM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$111,342
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$111,342
Maintenance Savings ($/Yr):	$4,329
Energy Savings ($/Yr):	$4,000
Total Yearly Savings ($/Yr):	$8,329
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.4
Simple Lifetime ROI	12.2%
Simple Lifetime Maintenance Savings	$64,935
Simple Lifetime Savings	$124,935
Internal Rate of Return (IRR)	1.5%
Net Present Value (NPV)	($11,910.94)

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures. While facility staff may already perform some of these items, they are stated to remind the owner of the energy savings benefit of continual performance. These measures are typically not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode.

F. Replace any old CRT Monitors with LED/LCD Type Monitors, which can draw as much as a quarter the power of an equivalent CRT monitor.

G. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Ocean County - Court House

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^{n_i}}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^{n_i}}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade	$185,000	$75,000	$51,550	$208,450	$13,880	$0	$13,880	15	$208,200	$0	-0.1%	15.0	-0.01%	($42,751.46)
ECM #2	Lighting Controls	$10,000	$5,000	$1,650	$13,350	$1,291	$0	$1,291	15	$19,365	$0	45.1%	10.3	5.06%	$2,061.87
ECM #3	Vending Miser Controls	$800	$200	$0	$1,000	$712	$0	$712	10	$7,117	$0	611.7%	1.4	70.83%	$5,070.69
ECM #4	Domestic Heater Upgrade	$14,000	$10,000	$300	$23,700	$1,708	$0	$1,708	15	$25,620	$0	8.1%	13.9	0.99%	($3,310.01)
ECM #5	Premium Efficiency Motors	$22,000	$10,000	$0	$32,000	$1,287	$0	$1,287	18	$23,166	$0	-27.6%	24.9	-3.20%	($14,299.23)
ECM #6	Multi-Zone to VAV	$30,000	$37,000	$0	$67,000	$3,529	$0	$3,529	15	$52,935	$0	-21.0%	19.0	-2.81%	($24,871.03)
ECM #7	Cooling Tower VFD Fan	$11,000	$9,500	$900	$19,600	$650	$0	$650	15	$9,750	$0	-50.3%	30.2	-7.68%	($11,840.34)
ECM #8	Rooftop Unit Replacement	$25,000	$23,000	$230	$47,770	$2,232	$0	$2,232	15	$33,480	$0	-29.9%	21.4	-4.15%	($21,124.53)
ECM #9	West Boiler Replacement	$33,000	$21,000	$1,313	$52,688	$1,760	$0	$1,760	25	$44,000	$0	-16.5%	29.9	-1.34%	($22,040.36)
ECM #10	East Chiller Replacement	$130,000	$105,000	$3,200	$231,800	$6,563	$0	$6,563	25	$164,075	$0	-29.2%	35.3	-2.50%	($117,517.51)
ECM #11	Central DDC	$200,000	$100,000	$0	$300,000	$9,212	$0	$9,212	15	$138,180	$0	-53.9%	32.6	-8.42%	($190,027.74)
ECM #12	Window Replacement	$35,000	$20,000	$0	$55,000	$1,057	$0	$1,057	25	$26,425	$0	-52.0%	52.0	-4.99%	($36,594.30)
ECM #13	Plug Load Management	$10,000	$4,000	$0	$14,000	$1,097	$0	$1,097	15	$16,455	$0	17.5%	12.8	2%	($904.09)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	24 kW Roof Array	$66,805	$44,537	$0	$111,342	$4,000	$4,329	$8,329	15	$124,935	$64,935	12.2%	13.4	1.48%	($11,910.94)

Notes: 1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

Concord Engineering Group, Inc.

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VOORHEES, NEW JERSEY 08043
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SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives from July 1, 2013 to June 30, 2014:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Cooling

Gas Absorption Chillers	$185 - $450 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $92 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

Closed Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps ≥ 20 hp	$60 per VFD rated hp
Rotary Screw Air Compressors ≥ 25 hp	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot (For fixtures ≥ 150w)	$25 per fixture
HID ≥ 100w Replace with new induction fixture. (must be 30% less watts/fixture than HID system)	$70 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Stairwell and Passageway Luminaires	$40 per fixture
LED Bollard Fixtures	$50 per fixture
Luminaires for Ambient Lighting of Interior Commercial Spaces (1x4, 2x2, 2x4)	$50 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$10 per lamp for R/PAR20,MR/PAR16,Globe,Candelabra or Misc $20 per lamp for R/BR/PAR 30, R/BR/PAR 38-40, A-Lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted (Existing Facilities Only)	$20 per control
Remote Mounted (Existing Facilities Only)	$35 per control
Daylight Dimming Controls	$45 per fixture controlled
Occupancy Based hi-low Dimming Control	$35 per fixture controlled
Occupancy Sensor Remote Mounted	$35 per control

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and an IRR of at least 10%.

APPENDIX C

Appendix C

Energy Star Statement of Energy Performance

A SEP could not be generated for this property through Portfolio Manager due to 12 months of consecutive utility billing being unavailable.

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

Split System Units

Tag	CU-6 (SC-40)	CU	WAC-1
Unit Type	Condensing Unit	Condensing Unit	Window Unit
Qty	1	1	1
Location	East Lower Roof Rear	East Lower Roof Rear	Room 215
Area Served	SC-40		Room 215
Manufacturer	Bohn	UPG	Electrolux
Model #	DVS025 2A	HBBA-F030SG	FAS185P2A1
Serial #	T94E02407	W0H5621042	RK51016351
Cooling Type	DX	DX (R-22)	DX (R-22)
Cooling Capacity (Tons)	25	2.5	1.5
Cooling Efficiency (SEER/EER)	8 EER (Est)	10 SEER (Est)	10.7 EER
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	20	6	4
ASHRAE Service Life	15	15	10
Remaining Life	(5)	9	6
Comments	208/230V 3P	208/230V 1P	208/230V 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU-220	CU	CU
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	West Roof	Ground West CH Square	Ground West CH Square
Area Served	FCU-220	Storage Rm #012	Miscellaneous Room #002
Manufacturer	Carrier	Sanyo	Mitsubishi
Model #	38CK060540	CM1812	MU17NN2
Serial #	5093E10297	0130694	10001421
Cooling Type	DX (R-22)	DX (R-22)	DX (R-22)
Cooling Capacity (Tons)	5	1.5	1.5
Cooling Efficiency (SEER/EER)	10 SEER	10 SEER	10 SEER
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	4	13	13
ASHRAE Service Life	15	15	15
Remaining Life	11	2	2
Comments	208/230V 3P	208/230V 1P	208/230V 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU	CU	CU
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	Ground West CH Square	Ground Courthouse Lane Side	Ground Courthouse Lane Side
Area Served	Computer Room #013	1st Flr Rm 120	1st Flr Rm 119
Manufacturer	Sanyo	Payne	Sanyo
Model #	SAP242CH	PH10PA060-G	CL2432
Serial #	0083553	3805X99604	0037002
Cooling Type	DX (R-22)	DX (R-22)	DX (R-22)
Cooling Capacity (Tons)	2	5	2
Cooling Efficiency (SEER/EER)	7.5 EER	9 EER	10 SEER
Heating Type	Heat Pump	Heat Pump	N/A
Heating Input (MBH)	26 MBH	56 MBH	N/A
Efficiency	2.5 COP	2.92 COP	N/A
Fuel	Electric	Electric	N/A
Approx Age	13	9	11
ASHRAE Service Life	15	15	15
Remaining Life	2	6	4
Comments	208/230V 1P	208/230V 1P	208/230V 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU	CU	CU
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	2
Location	Ground Courthouse Lane Side	Ground Courthouse Front	Ground Courthouse Front
Area Served	2nd Flr Rm 216		Entry Lobby
Manufacturer	Carrier	Fujitsu	EMI
Model #	38QH030310	A0U18CL	SCC24DF0000AA0A
Serial #	0989E57220	DCN009434	1-04-D9328-20
Cooling Type	DX (R-22)	DX (R-22)	DX (R-22)
Cooling Capacity (Tons)	2.5	1.5	2
Cooling Efficiency (SEER/EER)	8 EER	10 SEER	10 SEER
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	25	14	11
ASHRAE Service Life	15	15	15
Remaining Life	(10)	1	4
Comments	208/230V 1P	208/230V 1P	208/230V 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU	CU	CU
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	Ground Courthouse Front	Ground Courthouse Front	Ground Courthouse Front
Area Served	Rm #113	Basement	Room 108
Manufacturer	Sanyo	Mitsubishi	Mitsubishi
Model #	C1822	MUZ-GE12NA	MUM18EW
Serial #	0095893	3007082T	45900201B
Cooling Type	DX (R-22)	DX R410a	DX (R-22)
Cooling Capacity (Tons)	1.5	1	1.5
Cooling Efficiency (SEER/EER)	10.4 SEER	20.5 SEER	10 SEER
Heating Type	N/A	Heat Pump	N/A
Heating Input (MBH)	N/A	14.4 MBH	N/A
Efficiency	N/A	10 HSPF	N/A
Fuel	N/A	Electric	N/A
Approx Age	14	2	7
ASHRAE Service Life	15	15	15
Remaining Life	1	13	8
Comments	208/230V 1P	208/230V 1P	208/230V 1P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Split System Units

Tag	CU	CU	
Unit Type	Condensing Unit	Condensing Unit	
Qty	1	1	
Location	Ground Courthouse Front	Ground East CH Square	
Area Served	Basement	Room 106	
Manufacturer	Mitsubishi	Mitsubishi	
Model #	MUH12EN	PUG24PKB	
Serial #	3007082	0224227	
Cooling Type	DX (R-22)	DX (R-22)	
Cooling Capacity (Tons)	1	2	
Cooling Efficiency (SEER/EER)	9.3 EER	12 SEER	
Heating Type	N/A	N/A	
Heating Input (MBH)	N/A	N/A	
Efficiency	N/A	N/A	
Fuel	N/A	N/A	
Approx Age	5	12	
ASHRAE Service Life	15	15	
Remaining Life	10	3	
Comments		230V 1P	

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

AHUs

Tag	AC#1	AHU-6 (20-SC-40)	HVAC-3
Unit Type	Indoor Air Handler	Indoor Air Handler	Multi-Zone Unit
Qty	1	1	1
Location	Chiller Room	Boiler Room East	Penthouse Mech - East
Area Served	Basement	Courtroom	3rd Flr Rms 348,347,344,345
Manufacturer	Trane	Trane	-
Model #	CC	SWUB-C156D	-
Serial #	-	S87G52096	-
Cooling Type	Chilled Water	DX	Chilled Water
Cooling Capacity (Tons)	-	25.0	-
Cooling Efficiency (EER)	N/A	N/A	N/A
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input (MBH)	-	-	-
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	-	-	3.00
Approx Age	-	27	20
ASHRAE Service Life	20	20	20
Remaining Life		(7)	0
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	HVAC-2	AC-2	AC-CR-7
Unit Type	Multi-Zone Unit	Indoor Air Handler	
Qty	1	1	1
Location	Penthouse Mech - East	Rm 144 Mech	Basement East Wing
Area Served	2nd Floor Hallways, 248, 247, 244, 245	1st Floor	Court Room #7
Manufacturer	-	Trane	Trane
Model #	-	MCCA014	BH-10B
Serial #	-	K00K67263	651-95F
Cooling Type	Chilled Water	Chilled Water	Chilled Water
Cooling Capacity (Tons)	-	-	-
Cooling Efficiency (EER)	N/A	N/A	N/A
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input (MBH)	-	-	-
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	3.00	7.50	1.50
Approx Age	20	14	20
ASHRAE Service Life	20	20	20
Remaining Life	0	6	0
Comments		3/4 HP Return Fan	Coils Downstream of Unit

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	RTU #1	AHU-1 to 4	AH-1
Unit Type	Rooftop	Air Handler	Indoor Air Handler
Qty	1	4	1
Location	Washington St Lower Roof	Historic CH Attic	Historic CH Attic
Area Served		Historic Multipurpose	Historic Courthouse
Manufacturer	AAON	York	Carrier
Model #	RK-10-2-40-75W:HA000B000-	-	39ED11
Serial #	200101-AKWJ00249	-	4287 T 03401
Cooling Type	DX	Chilled Water	Chilled Water
Cooling Capacity (Tons)	10.0	-	-
Cooling Efficiency (EER)		N/A	N/A
Heating Type	Hot Water	Hot Water	Hot Water
Heating Input (MBH)	-	-	-
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	3.00	-	-
Approx Age	13	-	27
ASHRAE Service Life	15	20	20
Remaining Life	2		(7)
Comments	2 HP EF		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	FCU-220	RTU-#2	RTU-#3
Unit Type	Fan Coil	Rooftop Unit	Rooftop Unit
Qty	1	1	1
Location	Surrogate #220	West Roof	West Roof
Area Served	Surrogate #220	Courtroom #2 West	Chambers
Manufacturer	Carrier	Trane	Trane
Model #	FB4ANB070000ABAA	SACA-503A	SAHA
Serial #	0494A00024	77L-13111	-
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)		5.0	2.5
Cooling Efficiency (EER)		7 EER (est)	7 EER (est)
Heating Type	N/A	Electric Duct	N/A
Heating Input (MBH)	N/A	14.4 kW	N/A
Heating Efficiency (%)	N/A	100%	N/A
Supply Fan (HP)	0.75	1.50	-
Approx Age	10	37	37
ASHRAE Service Life	20	15	15
Remaining Life	10	(22)	(22)
Comments	208/230V 1P	208/230V 3P	208/230V 3P

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	SP-11	FCU-010	UV
Unit Type	Vertical Fan Coil	Vertical Fan Coil	Unit Vent
Qty	1	1	1
Location	Public Records Rm 114	Deed Room #010	Room #121
Area Served	Public Records Rm 114	Deed Room #010	Room #121
Manufacturer	Carrier	Trane	AAF
Model #	FY4ANB060T00AAAA	TWE060P130B0	UERQ5030CH00H46
Serial #	1709A84242	R123SD91V	E735098010
Cooling Type	DX	DX	DX
Cooling Capacity (Tons)	5.0	5.0	2.5
Cooling Efficiency (EER)			
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	0.75	0.50	0.50
Approx Age	5	14	5
ASHRAE Service Life	15	20	20
Remaining Life	10	6	15
Comments	208/230V 1P		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

Domestic Water Heaters

Tag	HWH-1	HWH-2	
Unit Type	Boiler	Electric Heater	
Qty	1	1	
Location	Boiler Room - East	Boiler Room - West	
Area Served	East Wing Domestic	West Wing - Historic	
Manufacturer	Aerco	A.O. Smith	
Model #	KC-1000	DVE 120 100	
Serial #	G-00-0863	0901M0000909	
Size (Gallons)	N/A	119	
Input Capacity (MBH/KW)	1000	12 KW	
Recovery (Gal/Hr)	-	-	
Efficiency %	85%	98%	
Fuel	Natural Gas	Electric	
Approx Age	14	5	
ASHRAE Service Life	24	15	
Remaining Life	10	10	
Comments	Attached to 500 Gal Storage tank and HX. Used Sparingly as connected with main boilers		

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

Boilers

Tag	B-1-4	B-5, 6
Unit Type	Condensing Boiler	Cast Iron Sectional (6)
Qty	4	2
Location	Boiler Room - East	Boiler Room - West
Area Served	Court House East Wing	West & Historic Wings
Manufacturer	Aerco	Weil McLain
Model #	BMK-2.0	688
Serial #	G00-0858	-
Input Capacity (Btu/Hr)	2,000,000	1,701,000
Rated Output Capacity (Btu/Hr)	1,760,000	1,413,000
Approx. Efficiency %	88%	83%
Fuel	Natural Gas	Natural Gas
Approx Age	14	5
ASHRAE Service Life	24	24
Remaining Life	10	19
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJ

C

Boilers

Tag	B-7
Unit Type	Cast Iron Sectional (7)
Qty	1
Location	Boiler Room - West Basement
Area Served	Hot Water Section West Wing
Manufacturer	H.B. Smith
Model #	2500A
Serial #	-
Input Capacity (Btu/Hr)	900,000
Rated Output Capacity (Btu/Hr)	617,400
Approx. Efficiency %	69%
Fuel	Natural Gas
Approx Age	24
ASHRAE Service Life	24
Remaining Life	0
Comments	

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

Chiller

Tag	CH-1	ACH-1	ACH-2
Unit Type	Water-Cooled	Air-Cooled	Air-Cooled
Qty	1	1	1
Location	East Wing Chiller Room	West Wing Chiller	West Wing Chiller
Area Served	East Wing	West Wing / Historic	West Wing / Historic
Manufacturer	Carrier	York	Trane
Model #	19DK5526AC	YCAZ33JD3/17PC	CGAFC60EAEA100CDF00J
Serial #	85-25-37335	YGAM918886	C00K32575
Refrigerant	R-11	R-22	R-22
Cooling Capacity (Tons)	200	60	60
Cooling Efficiency (KW/Ton)	0.715	-	_
Volts / Phase / Hz	208/3/60	200/3/60	200/3/60
Fuel	Electric	Electric	Electric
Chilled Water GPM / ΔT	430 GPM, 10 dT	-	-
Condenser Water GPM / ΔT	480 GPM, 10 dT	N/A	N/A
Approx Age	29	23	14
ASHRAE Service Life	25	20	20
Remaining Life	(4)	(3)	6
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

Cooling Tower

Tag	CT-1		
Unit Type	Open Tower		
Qty	1		
Location	East Roof		
Area Served	Chiller		
Manufacturer	BAC		
Model #	33235		
Serial #	U002062001		
Rated Flow GPM	480		
EWT / LWT	95/85 F		
Motor HP	Dual Motor 15 HP, 5 HP (Est)		
Electrical	480v / 3P		
Approx Age	14		
ASHRAE Service Life	20		
Remaining Life	6		
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Court House (100 Hooper)

Pumps

Tag	HWP-#5, 6	CWP-1, 2	CHWP-1,2
Unit Type	End Suction	End Suction	End Suction
Qty	2	2	2
Location	Chiller Room	Chiller Room	Chiller Room
Area Served	East Wing	East Wing (CH-1)	East Wing (CH-1)
Manufacturer	-	Armstrong	Bell & Gossett
Model #	-	4A8x1.0	4BC 8.500 BF
Serial #	-	1237	2286964
Horse Power	7.5	10.0	15.0
Flow	-	480 GPM, 50' HD	430 GPM, 65' HD
Motor Info	Baldor Fr 213T	Baldor Fr 215T	US Elec Fr 254T
Electrical Power	208-230/460V 3P	208-230/460V 3P	200V 3P
RPM	1730	1725	1775
Motor Efficiency %	84.0%	87%, 91.7%	89.5%
Approx Age	15	15	15
ASHRAE Service Life	18	18	18
Remaining Life	3	3	3
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Pumps

Tag	DWP--3, 4	HWP-1, 2	CHWP-1,2
Unit Type	End Suction	End Suction	End Suction
Qty	2	2	2
Location	Boiler Room	Basement Historic CH	Basement Historic CH
Area Served	Domestic Water	Historic Wing Hot Water	Historic Wing Chilled Water
Manufacturer	Aurora	Bell & Gossett	Bell & Gossett
Model #	B7-08100	438 AB 6.500 BF	-
Serial #	-	1737856	-
Horse Power	3	2	7.5
Flow	115 GPM, 40' HD	50 GPM, 45' HD	-
Motor Info	US Elec Fr 182T	Magnetek Fr P145T	Magnetek Fr S213T
Electrical Power	230/460V 3P	200V 3P	200V 3P
RPM	1745	1745	1755
Motor Efficiency %	86.5%	84.0%	88.5%
Approx Age	15	15	15
ASHRAE Service Life	18	18	18
Remaining Life	3	3	3
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Pumps

Tag	CP-1	CP-2
Unit Type	Condensate Return Station	Condensate Return Station
Qty	2	2
Location	Basement Historic CH	Room 41
Area Served	Steam Loop	Steam Loop
Manufacturer	Domestic	Domestic
Model #	-	-
Serial #	-	-
Horse Power	0.25, 0.5	0.33
Flow	-	-
Motor Info	Peerless, Fr H10	GE Motor Fr 56J
Electrical Power	200V 1P	115/208V 1P
RPM	1750	3450
Motor Efficiency %	69.0%	-
Approx Age	18	5
ASHRAE Service Life	18	18
Remaining Life	0	13
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

APPENDIX E

CEG Project #: 1C14065
Facility Name: Court House
Address: 100 Hooper Avenue
City, State, Zip Toms River, NJ 08753

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
1	143A - 1st Floor Court Room	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	25	1.55	4,030	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	25	1.15	2,990	0.40	1,040	$146	0	No New Controls	0	0.0%	0	$0	$3,625.00	$1,625.00	$5,250.00	$1,250.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	143B - Office Room	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	143C - Bathroom	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$50.00	$50.00	$100.00	$20.00	23.89
1	143D - Bathroom	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$50.00	$50.00	$100.00	FALSE	29.86
1	145A - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$200.00	$50.00	$250.00	$35.00	16.05
47	145A - Judge Chambers	2600	2-Lamp CFL Recessed Can	2	42	2	0.08	218	Existing to Remain	No Change	2	42	0	0.08	218	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
5	Back Offices	2600	3-Lamp T8 F32 2x4 Recessed Parabolic Lens	3	93	3	0.28	725	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	429	0.11	296	$41	0	No New Controls	0	0.0%	0	$0	$630.00	$195.00	$825.00	$150.00	16.27	$0.00	$0.00	$0.00	FALSE	-
1	Back Offices	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	27.47	$0.00	$0.00	$0.00	FALSE	-
47	Back Offices	2600	2-Lamp CFL Recessed Can	2	42	1	0.04	109	Existing to Remain	No Change	2	42	0	0.04	109	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
1	142 - Courtroom	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	20	1.24	3,224	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	20	0.92	2,392	0.32	832	$116	0	No New Controls	0	0.0%	0	$0	$2,900.00	$1,300.00	$4,200.00	$1,000.00	27.47	$0.00	$0.00	$0.00	FALSE	-
47	142 - Courtroom	2600	2-Lamp CFL Recessed Can	2	42	6	0.25	655	Existing to Remain	No Change	2	42	0	0.25	655	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
5	142A	2600	3-Lamp T8 F32 2x4 Recessed Parabolic Lens	3	93	3	0.28	725	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	429	0.11	296	$41	0	No New Controls	0	0.0%	0	$0	$630.00	$195.00	$825.00	$150.00	16.27	$0.00	$0.00	$0.00	FALSE	-
1	142B	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	141 - Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$50.00	$50.00	$100.00	FALSE	14.93
47	141 - Office	2600	2-Lamp CFL Recessed Can	2	42	5	0.21	546	Existing to Remain	No Change	2	42	0	0.21	546	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
1	141B - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	5	0.31	806	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	598	0.08	208	$29	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	120	$17	$725.00	$325.00	$1,050.00	$250.00	27.47	$200.00	$50.00	$250.00	$35.00	12.84
47	141B - Judge Chambers	2600	2-Lamp CFL Recessed Can	2	42	6	0.25	655	Existing to Remain	No Change	2	42	0	0.25	655	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
1	141B - Judge Chambers - Bathroom	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$50.00	$50.00	$100.00	FALSE	29.86
6	141A - Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99
1	129 - Court Room	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	20	1.24	3,224	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	20	0.92	2,392	0.32	832	$116	0	No New Controls	0	0.0%	0	$0	$2,900.00	$1,300.00	$4,200.00	$1,000.00	27.47	$0.00	$0.00	$0.00	FALSE	-
5	Office	2600	3-Lamp T8 F32 2x4 Recessed Parabolic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99
1	132 - Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	144	$20	$870.00	$390.00	$1,260.00	$300.00	27.47	$50.00	$50.00	$100.00	$20.00	3.98
1	Judge Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$200.00	$50.00	$250.00	$35.00	16.05
47	Judge Office	2600	2-Lamp CFL Recessed Can	2	42	6	0.25	655	Existing to Remain	No Change	2	42	0	0.25	655	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
1	Court Room 3	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	28	1.74	4,514	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	28	1.29	3,349	0.45	1,165	$163	0	No New Controls	0	0.0%	0	$0	$4,060.00	$1,820.00	$5,880.00	$1,400.00	27.47	$0.00	$0.00	$0.00	FALSE	-
2	127 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	1,451	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,076	0.14	374	$52	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	215	$30	$1,305.00	$585.00	$1,890.00	$450.00	27.47	$200.00	$50.00	$250.00	$35.00	7.13
37	127 - Office - Back Room	2600	2-Lamp T8 2' Surface Mount Prismatic Lens	2	33	1	0.03	86	Replace Fixture	1x2 Surface LED 2700 lumen 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	83	0.00	3	$0	0	No New Controls	0	0.0%	0	$0	$110.00	$65.00	$175.00	$0.00	480.77	$0.00	$0.00	$0.00	FALSE	-
41	Bathrooms	2600	1-Lamp T8 4' Surface Wall Mount Opaque Lens	1	32	2	0.06	166	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	2	0.06	146	0.01	21	$3	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	29	$4	$280.00	$130.00	$410.00	$0.00	140.80	$50.00	$50.00	$100.00	FALSE	24.53
1	130 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	10	0.62	1,612	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	1,196	0.16	416	$58	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	239	$33	$1,450.00	$650.00	$2,100.00	$500.00	27.47	$200.00	$50.00	$250.00	$35.00	6.42

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
1	130 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	144	$20	$870.00	$390.00	$1,260.00	$300.00	27.47	$200.00	$50.00	$250.00	$35.00	10.70
54	130 - Judge Chambers - Bathroom	2600	2-Lamp CFL Wall Mount Opaque Lens	2	64	1	0.06	166	Existing to Remain	No Change	2	64	0	0.06	166	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	33	$5	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	21.46
6	137 - Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	6	0.56	1,451	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	858	0.23	593	$83	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	172	$24	$1,260.00	$390.00	$1,650.00	$300.00	16.27	$200.00	$50.00	$250.00	$35.00	8.95
6	Security Entrance Hall	3000	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	12	1.12	3,348	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	12	0.66	1,980	0.46	1,368	$192	0	No New Controls	0	0.0%	0	$0	$2,520.00	$780.00	$3,300.00	$600.00	14.10	$0.00	$0.00	$0.00	FALSE	-
5	Security Entrance	3000	3-Lamp T8 F32 2x4 Recessed Parabolic Lens	3	93	8	0.74	2,232	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	8	0.44	1,320	0.30	912	$128	0	No New Controls	0	0.0%	0	$0	$1,680.00	$520.00	$2,200.00	$400.00	14.10	$0.00	$0.00	$0.00	FALSE	-
2	151A - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$54	0	No New Controls	0	0.0%	0	$0	$1,160.00	$520.00	$1,680.00	$400.00	23.81	$0.00	$0.00	$0.00	FALSE	-
6	152 - Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	4	0.37	967	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	572	0.15	395	$55	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	114	$16	$840.00	$260.00	$1,100.00	$200.00	16.27	$50.00	$50.00	$100.00	$20.00	5.00
6	153 - Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	3	0.28	725	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	429	0.11	296	$41	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$12	$630.00	$195.00	$825.00	$150.00	16.27	$50.00	$50.00	$100.00	$20.00	6.66
6	155	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	4	0.37	967	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	572	0.15	395	$55	0	No New Controls	0	0.0%	0	$0	$840.00	$260.00	$1,100.00	$200.00	16.27	$0.00	$0.00	$0.00	FALSE	-
5	154 - Office	2600	3-Lamp T8 F32 2x4 Recessed Parabolic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99
1	101A - Security Entrance	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$60	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	101A - Security Entrance	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$13	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	23.81	$0.00	$0.00	$0.00	FALSE	-
6	150 - Sheriff's Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	1	0.09	242	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	143	0.04	99	$14	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	29	$4	$210.00	$65.00	$275.00	$50.00	16.27	$50.00	$50.00	$100.00	FALSE	24.98
2	150 - Sheriff's Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	0	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$0.00	$0.00	$0.00	FALSE	0.00
2	252 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	144	$20	$870.00	$390.00	$1,260.00	$300.00	27.47	$200.00	$50.00	$250.00	$35.00	10.70
2	241 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	3	0.19	484	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	359	0.05	125	$17	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	72	$10	$435.00	$195.00	$630.00	$150.00	27.47	$200.00	$50.00	$250.00	$35.00	21.40
12	241 - Judge Chambers - Bathroom	2600	4-Lamp T8 F32 2x4 Surface Mount Prismatic	4	114	1	0.11	296	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24ACS-LD3-55-UNV-840-CD1-U	1	55	1	0.06	143	0.06	153	$21	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	29	$4	$175.00	$65.00	$240.00	$50.00	8.85	$50.00	$50.00	$100.00	FALSE	24.98
2	241 - Judge Chambers - Judge Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	144	$20	$870.00	$390.00	$1,260.00	$300.00	27.47	$200.00	$50.00	$250.00	$35.00	10.70
8	247 - Court Room 8	2600	2-Lamp 4' T8 Reccessed Prismatic Lens	2	62	28	1.74	4,514	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	28	1.34	3,494	0.39	1,019	$143	0	No New Controls	0	0.0%	0	$0	$3,640.00	$1,820.00	$5,460.00	$1,400.00	28.45	$0.00	$0.00	$0.00	FALSE	-
8	247 - Court Room 8 - Office	2600	2-Lamp 4' T8 Reccessed Prismatic Lens	2	62	6	0.37	967	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	6	0.29	749	0.08	218	$31	0	No New Controls	0	0.0%	0	$0	$780.00	$390.00	$1,170.00	$300.00	28.45	$0.00	$0.00	$0.00	FALSE	-
15	247 - Court Room 8 - Office - Bathroom 1	2600	1-Lamp CFL Screw Type Recessed No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	11	$2	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	65.41
16	247 - Court Room 8 - Office - Bathroom 2	2600	1-Lamp CFL Screw Type Recessed Prismatic Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	11	$2	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	65.41
8	245 - Court Room 7	2600	2-Lamp 4' T8 Reccessed Prismatic Lens	2	62	28	1.74	4,514	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	28	1.34	3,494	0.39	1,019	$143	0	No New Controls	0	0.0%	0	$0	$3,640.00	$1,820.00	$5,460.00	$1,400.00	28.45	$0.00	$0.00	$0.00	FALSE	-
2	241 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	12	0.74	1,934	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	12	0.55	1,435	0.19	499	$70	0	No New Controls	0	0.0%	0	$0	$1,740.00	$780.00	$2,520.00	$600.00	27.47	$0.00	$0.00	$0.00	FALSE	-
6	241 - Judge Chambers - Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	16.27	$0.00	$0.00	$0.00	FALSE	-
2	240D - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	3	0.19	484	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	359	0.05	125	$17	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	72	$10	$435.00	$195.00	$630.00	$150.00	27.47	$50.00	$50.00	$100.00	$20.00	7.96
1	300 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	144	$20	$870.00	$390.00	$1,260.00	$300.00	27.47	$200.00	$50.00	$250.00	$35.00	10.70
1	300 - Judge Chambers	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	5	Dual Technology Occupancy Sensor - Remote Mnt.	0	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$0.00	$0.00	$0.00	FALSE	0.00
17	300 - Judge Chambers - Closet	2600	1-Lamp CFL Screw Type Pendant No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
1	310 - Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	310 - Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	27.47	$0.00	$0.00	$0.00	FALSE	-

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
1	309 - Office	2600	2-Lamp T8-U 2x2 Reccessed Parabolic Lens	2	62	3	0.19	484	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	359	0.05	125	$17	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	72	$10	$435.00	$195.00	$630.00	$150.00	27.47	$50.00	$50.00	$100.00	$20.00	7.96
8	Court Room 9	2600	2-Lamp 4' T8 Reccessed Prismatic Lens	2	62	28	1.74	4,514	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	28	1.34	3,494	0.39	1,019	$143	0	No New Controls	0	0.0%	0	$0	$3,640.00	$1,820.00	$5,460.00	$1,400.00	28.45	$0.00	$0.00	$0.00	FALSE	-
8	303 - Court Room 10	2600	2-Lamp 4' T8 Reccessed Prismatic Lens	2	62	28	1.74	4,514	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	28	1.34	3,494	0.39	1,019	$143	0	No New Controls	0	0.0%	0	$0	$3,640.00	$1,820.00	$5,460.00	$1,400.00	28.45	$0.00	$0.00	$0.00	FALSE	-
1	309 - Judge Chambers	2600	2-Lamp T8-U 2x2 Reccessed Parabolic Lens	2	62	12	0.74	1,934	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	12	0.55	1,435	0.19	499	$70	0	No New Controls	0	0.0%	0	$0	$1,740.00	$780.00	$2,520.00	$600.00	27.47	$0.00	$0.00	$0.00	FALSE	-
49	Judge Vincent Chambers	2600	1-Lamp CFL Recessed Can	1	21	18	0.38	983	Existing to Remain	No Change	1	21	0	0.38	983	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
64	Historic Court Room	2600	15-Lamp Chandalier Med Base Torpedo (Historic Court Room)	15	375	4	1.50	3,900	Re-lamp	Philips LED Med Base 3w Blunt Tip	15	45	4	0.18	468	1.32	3,432	$480	0	No New Controls	0	0.0%	0	$0	$1,200.00	$400.00	$1,600.00	$600.00	2.08	$0.00	$0.00	$0.00	FALSE	-
65	Historic Court Room	2600	1-Lamp Wall Mount Fixture Med Base Torpedo (Historic Court Room)	1	25	12	0.30	780	Re-lamp	Philips LED Med Base 3w Blunt Tip	1	3	12	0.04	94	0.26	686	$96	0	No New Controls	0	0.0%	0	$0	$240.00	$1,200.00	$1,440.00	$120.00	13.74	$0.00	$0.00	$0.00	FALSE	-
66	Historic Court Room	2600	1-Lamp Recessed Lens (Historic Court Room)	1	21	27	0.57	1,474	Existing to Remain	No Change	1	21	0	0.57	1,474	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
67	Historic Court Room	2600	1-Lamp MH Wall Mount Spot Light (Historic Court Room)	1	92	4	0.37	957	Existing to Remain	No Change	1	92	0	0.37	957	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
7	Historic Court Room - Kitchen	2600	4-Lamp T8 F32 2x4 Recessed Parabolic Lens	4	114	1	0.11	296	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	1	0.07	187	0.04	109	$15	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$5	$210.00	$65.00	$275.00	$50.00	14.72	$50.00	$50.00	$100.00	FALSE	19.08
49	Historic Court Room - Kitchen	2600	1-Lamp CFL Recessed Can	1	21	4	0.08	218	Existing to Remain	No Change	1	21	0	0.08	218	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
20	Historic Court Room - Kitchen	2600	1-Lamp T12 4' Surface Wall Mount Prismatic Lens	1	46	1	0.05	120	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	73	0.02	47	$7	0	No New Controls	0	0.0%	0	$0	$140.00	$65.00	$205.00	$0.00	31.29	$0.00	$0.00	$0.00	FALSE	-
49	Judge Chambers	2600	1-Lamp CFL Recessed Can	1	21	12	0.25	655	Existing to Remain	No Change	1	21	0	0.25	655	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
22	Judge Chambers	2600	2-Lamp T12 4' Reccessed Prismatic Lens	2	88	6	0.53	1,373	Replace Fixture	1x4 LED Recessed 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	6	0.23	593	0.30	780	$109	0	No New Controls	0	0.0%	0	$0	$810.00	$390.00	$1,200.00	$300.00	8.24	$0.00	$0.00	$0.00	FALSE	-
25	Historic Court Room - Office	2600	4-Lamp T12 2x4 Reccessed Parabolic Lens	4	176	4	0.70	1,830	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	4	0.29	749	0.42	1,082	$151	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	150	$21	$840.00	$200.00	$1,040.00	$0.00	6.87	$50.00	$50.00	$100.00	$20.00	3.82
49	West Wing Lobby	3000	1-Lamp CFL Recessed Can	1	21	4	0.08	252	Existing to Remain	No Change	1	21	0	0.08	252	0.00	0	$0	0	No New Controls	1	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$50.00	$50.00	FALSE	-
23	225 - Office	2600	2-Lamp T12 4' Pendant Prismatic Lens	2	88	2	0.18	458	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.08	208	$29	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	50	$7	$260.00	$130.00	$390.00	$0.00	13.39	$50.00	$50.00	$100.00	FALSE	14.31
9	200 - Office	2600	4-Lamp 8' T8 Pendant Parabolic Lens	4	320	2	0.64	1,664	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.54	1,414	$198	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	50	$7	$260.00	$130.00	$390.00	$100.00	1.46	$50.00	$50.00	$100.00	$20.00	11.45
9	201 - Office	2600	4-Lamp 8' T8 Pendant Parabolic Lens	4	320	2	0.64	1,664	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.54	1,414	$198	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	50	$7	$260.00	$130.00	$390.00	$100.00	1.46	$50.00	$50.00	$100.00	$20.00	11.45
9	202 - Office	2600	4-Lamp 8' T8 Pendant Parabolic Lens	4	320	2	0.64	1,664	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.54	1,414	$198	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	50	$7	$260.00	$130.00	$390.00	$100.00	1.46	$50.00	$50.00	$100.00	$20.00	11.45
10	202 - Office	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	25	$3	$130.00	$65.00	$195.00	$50.00	28.45	$50.00	$50.00	$100.00	FALSE	28.62
22	203 - Office	2600	2-Lamp T12 4' Reccessed Prismatic Lens	2	88	12	1.06	2,746	Replace Fixture	1x4 LED Recessed 3600 lumen 38w Cooper #14AC-LD3-35-UNV-L840-CD1-U	1	38	12	0.46	1,186	0.60	1,560	$218	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	237	$33	$1,620.00	$780.00	$2,400.00	$600.00	8.24	$50.00	$50.00	$100.00	$20.00	2.41
7	215 - Office	2600	4-Lamp T8 F32 2x4 Reccessed Parabolic Lens	4	114	3	0.34	889	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	3	0.22	562	0.13	328	$46	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	112	$16	$630.00	$195.00	$825.00	$150.00	14.72	$50.00	$50.00	$100.00	$20.00	5.09
7	205 - Storage	2600	4-Lamp T8 F32 2x4 Reccessed Parabolic Lens	4	114	2	0.23	593	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	2	0.14	374	0.08	218	$31	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	14.72	$0.00	$0.00	$0.00	FALSE	-
4	222 - Office	2600	4-Lamp T8 F32 1x4 Surface Mount Prismatic Lens	4	114	3	0.34	889	Replace Fixture	1x4 LED Surface 4100 Lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	3	0.14	374	0.20	515	$72	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	75	$10	$390.00	$195.00	$585.00	$150.00	6.04	$50.00	$50.00	$100.00	$20.00	7.63
27	223 - Office	2600	4-Lamp T12 1x4 Surface Mount Prismatic Lens	4	176	6	1.06	2,746	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	6	0.29	749	0.77	1,997	$280	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	150	$21	$780.00	$390.00	$1,170.00	$0.00	4.19	$200.00	$50.00	$250.00	$35.00	10.25
11	224 - Board of Tax Office	2600	2-Lamp T8 F32 4' Pendent Prismatic Lens	2	62	3	0.19	484	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	3	0.14	374	0.04	109	$15	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	75	$10	$390.00	$195.00	$585.00	$150.00	28.45	$50.00	$50.00	$100.00	$20.00	7.63
49	Surrogate Judge Office	2600	1-Lamp CFL Recessed Can	1	21	7	0.15	382	Existing to Remain	No Change	1	21	0	0.15	382	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
26	216 - Office Area	2600	4-Lamp T12 2x4 Reccessed Prismatic Lens	4	176	40	7.04	18,304	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	40	2.88	7,488	4.16	10,816	$1,514	0	No New Controls	0	0.0%	0	$0	$8,400.00	$2,000.00	$10,400.00	$0.00	6.87	$0.00	$0.00	$0.00	FALSE	-
26	217 - Office	2600	4-Lamp T12 2x4 Reccessed Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	4	0.29	749	0.42	1,082	$151	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	150	$21	$840.00	$200.00	$1,040.00	$0.00	6.87	$50.00	$50.00	$100.00	$20.00	3.82
24	Men's Toilet Next to 215	2600	2-Lamp T12 2x4 Surface Mount Prismatic Lens	2	88	2	0.18	458	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24ACS-LD3-55-UNV-840-CD1-U	1	55	2	0.11	286	0.07	172	$24	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$350.00	$130.00	$480.00	$0.00	19.98	$50.00	$50.00	$100.00	FALSE	12.49

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
4	212A - Office	2600	4-Lamp T8 F32 1x4 Surface Mount Prismatic Lens	4	114	3	0.34	889	Replace Fixture	1x4 LED Surface 4100 Lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	3	0.14	374	0.20	515	$72	0	No New Controls	1	0.0%	0	$0	$390.00	$195.00	$585.00	$150.00	6.04	$0.00	$50.00	$50.00	FALSE	-
10	212A - Office	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$50.00	28.45	$0.00	$0.00	$0.00	FALSE	-
4	212A - Office	2600	4-Lamp T8 F32 1x4 Surface Mount Prismatic Lens	4	114	4	0.46	1,186	Replace Fixture	1x4 LED Surface 4100 Lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.26	686	$96	0	No New Controls	0	0.0%	0	$0	$520.00	$260.00	$780.00	$200.00	6.04	$0.00	$0.00	$0.00	FALSE	-
56	212A - Office - Bathroom	2600	3-Lamp CFL Surface Mount Prismatic Lens	3	86	1	0.09	224	Existing to Remain	No Change	3	86	0	0.09	224	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	45	$6	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	15.97
57	212A - Office - Bathroom	2600	1-Lamp T12 4' Surface Mount No Lens	1	42	1	0.04	109	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-U-LC-UNV-840-CD1-U	1	28	1	0.03	73	0.01	36	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	15	$2	$140.00	$65.00	$205.00	$0.00	40.23	$50.00	$50.00	$100.00	FALSE	49.06
1	211 - Offices	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	14	0.87	2,257	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	14	0.64	1,674	0.22	582	$82	0	No New Controls	0	0.0%	0	$0	$2,030.00	$910.00	$2,940.00	$700.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	Court Room 2	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	32	1.98	5,158	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	32	1.47	3,827	0.51	1,331	$186	0	No New Controls	0	0.0%	0	$0	$4,640.00	$2,080.00	$6,720.00	$1,600.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	Judge Peterson Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	144	$20	$870.00	$390.00	$1,260.00	$300.00	27.47	$200.00	$50.00	$250.00	$35.00	10.70
1	Judge Peterson Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	5	Dual Technology Occupancy Sensor - Remote Mnt.	0	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$0.00	$0.00	$0.00	FALSE	0.00
1	Judge Peterson Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$200.00	$50.00	$250.00	$35.00	16.05
2	Judge Peterson Office - Closet	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	Judge Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	8	0.50	1,290	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	957	0.13	333	$47	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	191	$27	$1,160.00	$520.00	$1,680.00	$400.00	27.47	$200.00	$50.00	$250.00	$35.00	8.03
3	114 - Public Records Offices	2600	4-Lamp T8 F32 2x4 Recessed Prismatic Lens	4	114	48	5.47	14,227	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	48	3.46	8,986	2.02	5,242	$734	0	No New Controls	0	0.0%	0	$0	$10,080.00	$3,120.00	$13,200.00	$2,400.00	14.72	$0.00	$0.00	$0.00	FALSE	-
2	115 - Offices	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	1,451	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,076	0.14	374	$52	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	215	$30	$1,305.00	$585.00	$1,890.00	$450.00	27.47	$200.00	$50.00	$250.00	$35.00	7.13
3	114 - County Clerk Office	2600	4-Lamp T8 F32 2x4 Recessed Prismatic Lens	4	114	5	0.57	1,482	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	5	0.36	936	0.21	546	$76	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	187	$26	$1,050.00	$325.00	$1,375.00	$250.00	14.72	$50.00	$50.00	$100.00	$20.00	3.05
2	111 - Office	800	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	7	0.43	347	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	258	0.11	90	$13	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	52	$7	$1,015.00	$455.00	$1,470.00	$350.00	89.29	$200.00	$50.00	$250.00	$35.00	29.81
59	111 - Office - Bathroom	2600	2-Lamp T12 2x2 Recessed Prismatic Lens	2	72	1	0.07	187	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.03	68	$9	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	24	$3	$145.00	$65.00	$210.00	$0.00	22.19	$50.00	$50.00	$100.00	FALSE	29.86
2	109 - Copy Room	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$50.00	$50.00	$100.00	$20.00	5.97
1	112 - Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$50.00	$50.00	$100.00	$20.00	5.97
27	108 - Office	2600	4-Lamp T12 1x4 Surface Mount Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.51	1,331	$186	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	100	$14	$520.00	$260.00	$780.00	$0.00	4.19	$50.00	$50.00	$100.00	$20.00	5.72
5	107 - Office	2600	3-Lamp T8 F32 2x4 Recessed Parabolic Lens	3	93	6	0.56	1,451	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	858	0.23	593	$83	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	172	$24	$1,260.00	$390.00	$1,650.00	$300.00	16.27	$50.00	$50.00	$100.00	$20.00	3.33
3	106 - Office	2600	4-Lamp T8 F32 2x4 Recessed Prismatic Lens	4	114	5	0.57	1,482	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	5	0.36	936	0.21	546	$76	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	187	$26	$1,050.00	$325.00	$1,375.00	$250.00	14.72	$50.00	$50.00	$100.00	$20.00	3.05
27	100 - Office	2600	4-Lamp T12 1x4 Surface Mount Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.51	1,331	$186	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	100	$14	$520.00	$260.00	$780.00	$0.00	4.19	$50.00	$50.00	$100.00	$20.00	5.72
2	101 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	10	0.62	1,612	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	1,196	0.16	416	$58	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	239	$33	$1,450.00	$650.00	$2,100.00	$500.00	27.47	$200.00	$50.00	$250.00	$35.00	6.42
2	101 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$200.00	$50.00	$250.00	FALSE	37.33
2	103 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	8	0.50	1,290	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	957	0.13	333	$47	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	191	$27	$1,160.00	$520.00	$1,680.00	$400.00	27.47	$200.00	$50.00	$250.00	$35.00	8.03
12	103 - Office - Storage	2600	4-Lamp T8 F32 2x4 Surface Mount Prismatic	4	114	4	0.46	1,186	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24ACS-LD3-55-UNV-840-CD1-U	1	55	4	0.22	572	0.24	614	$86	0	No New Controls	0	0.0%	0	$0	$700.00	$260.00	$960.00	$200.00	8.85	$0.00	$0.00	$0.00	FALSE	-
12	104 - Office	2600	4-Lamp T8 F32 2x4 Surface Mount Prismatic	4	114	4	0.46	1,186	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24ACS-LD3-55-UNV-840-CD1-U	1	55	4	0.22	572	0.24	614	$86	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	114	$16	$700.00	$260.00	$960.00	$200.00	8.85	$50.00	$50.00	$100.00	$20.00	5.00
10	104 - Office - Bathroom	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	25	$3	$130.00	$65.00	$195.00	$50.00	28.45	$50.00	$50.00	$100.00	FALSE	28.62
60	104 - Office - Bathroom	2600	1-Lamp T8 2' Surface Mount Prismatic Lens	1	22	1	0.02	57	Replace Fixture	1x2 Surface LED 2700 lumen 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	83	(0.01)	(26)	($4)	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	17	$2	$110.00	$65.00	$175.00	$0.00	(48.08)	$50.00	$50.00	$100.00	FALSE	42.93
24	104 - Office	2600	2-Lamp T12 2x4 Surface Mount Prismatic Lens	2	88	2	0.18	458	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24ACS-LD3-55-UNV-840-CD1-U	1	55	2	0.11	286	0.07	172	$24	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	57	$8	$350.00	$130.00	$480.00	$0.00	19.98	$200.00	$50.00	$250.00	FALSE	31.22

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
3	104 - Office	2600	4-Lamp T8 F32 2x4 Recessed Prismatic Lens	4	114	2	0.23	593	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	2	0.14	374	0.08	218	$31	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	75	$10	$420.00	$130.00	$550.00	$100.00	14.72	$200.00	$50.00	$250.00	$35.00	20.51
27	113 - Office	2600	4-Lamp T12 1x4 Surface Mount Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.51	1,331	$186	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	100	$14	$520.00	$260.00	$780.00	$0.00	4.19	$50.00	$50.00	$100.00	$20.00	5.72
27	119 - Office	2600	4-Lamp T12 1x4 Surface Mount Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.51	1,331	$186	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	100	$14	$520.00	$260.00	$780.00	$0.00	4.19	$50.00	$50.00	$100.00	$20.00	5.72
2	121 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	20	1.24	3,224	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	20	0.92	2,392	0.32	832	$116	0	No New Controls	0	0.0%	0	$0	$2,900.00	$1,300.00	$4,200.00	$1,000.00	27.47	$0.00	$0.00	$0.00	FALSE	-
2	123 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	6	0.37	967	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	718	0.10	250	$35	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	27.47	$0.00	$0.00	$0.00	FALSE	-
2	123 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	1,451	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,076	0.14	374	$52	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	27.47	$0.00	$0.00	$0.00	FALSE	-
1	Entrance 118	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	12	0.74	2,232	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	12	0.55	1,656	0.19	576	$81	0	No New Controls	0	0.0%	0	$0	$1,740.00	$780.00	$2,520.00	$600.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	5	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	33	2.05	5,320	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	33	1.52	3,947	0.53	1,373	$192	0	No New Controls	0	0.0%	0	$0	$4,785.00	$2,145.00	$6,930.00	$1,650.00	27.47	$0.00	$0.00	$0.00	FALSE	-
62	006 - Boiler Room	2600	1-Lamp CFL	1	21	2	0.04	109	Existing to Remain	No Change	1	21	0	0.04	109	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
26	003 - Storage	2600	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	4	0.29	749	0.42	1,082	$151	0	No New Controls	0	0.0%	0	$0	$840.00	$200.00	$1,040.00	$0.00	6.87	$0.00	$0.00	$0.00	FALSE	-
26	007 - Storage	2600	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	2	0.35	915	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	2	0.14	374	0.21	541	$76	0	No New Controls	0	0.0%	0	$0	$420.00	$100.00	$520.00	$0.00	6.87	$0.00	$0.00	$0.00	FALSE	-
26	002 - Office	2600	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	8	1.41	3,661	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	8	0.58	1,498	0.83	2,163	$303	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	300	$42	$1,680.00	$400.00	$2,080.00	$0.00	6.87	$200.00	$50.00	$250.00	$35.00	5.13
2	002 - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	5	Dual Technology Occupancy Sensor - Remote Mnt.	0	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$0.00	$0.00	$0.00	FALSE	0.00
10	001 - Storage	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	6	0.37	967	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	6	0.29	749	0.08	218	$31	0	No New Controls	0	0.0%	0	$0	$780.00	$390.00	$1,170.00	$300.00	28.45	$0.00	$0.00	$0.00	FALSE	-
13	001 - Storage	2600	2-Lamp 8' T8 Surface Mount No Lens	2	160	2	0.32	832	Existing to Remain	8' LED Strip 9400 Lumen 96w Cooper #8TSNLED-LD1-94-LC-UNV-L840-CD2-U	2	160	0	0.32	832	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$550.00	$130.00	$680.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
10	014 - Office	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	3	0.19	484	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	3	0.14	374	0.04	109	$15	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	75	$10	$390.00	$195.00	$585.00	$150.00	28.45	$200.00	$50.00	$250.00	$35.00	20.51
21	014 - Office	2600	2-Lamp T12 4' Pendant Parabolic Lens	2	88	3	0.26	686	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	3	0.14	374	0.12	312	$44	5	Dual Technology Occupancy Sensor - Remote Mnt.	0	20.0%	75	$10	$390.00	$195.00	$585.00	$0.00	13.39	$0.00	$0.00	$0.00	$35.00	(3.34)
26	011 - Office	2600	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	4	0.29	749	0.42	1,082	$151	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	150	$21	$840.00	$200.00	$1,040.00	$0.00	6.87	$50.00	$50.00	$100.00	$20.00	3.82
26	009 - Office	2600	4-Lamp T12 2x4 Recessed Prismatic Lens	4	176	4	0.70	1,830	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24AC-LD3-68-UNV-L840-CD1-U	1	72	4	0.29	749	0.42	1,082	$151	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	150	$21	$840.00	$200.00	$1,040.00	$0.00	6.87	$50.00	$50.00	$100.00	$20.00	3.82
59	010 - Office	2600	2-Lamp T12 2x2 Recessed Prismatic Lens	2	72	1	0.07	187	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.03	68	$9	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$0.00	22.19	$0.00	$0.00	$0.00	FALSE	-
6	010 - Office	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	34	3.16	8,221	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	34	1.87	4,862	1.29	3,359	$470	0	No New Controls	0	0.0%	0	$0	$7,140.00	$2,210.00	$9,350.00	$1,700.00	16.27	$0.00	$0.00	$0.00	FALSE	-
18	3rd Floor B&G Closet	2600	1-Lamp CFL Pendant No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
2	3.1 - Elevator Lobby	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	0	No New Controls	0	0.0%	0	$0	$580.00	$260.00	$840.00	$200.00	27.47	$0.00	$0.00	$0.00	FALSE	-
10	B3.1 - Men's R.R.	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	2	0.12	322	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.03	73	$10	0	No New Controls	0	0.0%	0	$0	$260.00	$130.00	$390.00	$100.00	28.45	$0.00	$0.00	$0.00	FALSE	-
1	350 - Office	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$50.00	$50.00	$100.00	$20.00	5.97
2	3.2 - 3rd Floor Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	10	0.62	1,860	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	1,380	0.16	480	$67	0	No New Controls	0	0.0%	0	$0	$1,450.00	$650.00	$2,100.00	$500.00	23.81	$0.00	$0.00	$0.00	FALSE	-
10	B3.2 - Women's R.R.	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	2	0.12	322	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.03	73	$10	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	50	$7	$260.00	$130.00	$390.00	$100.00	28.45	$50.00	$50.00	$100.00	FALSE	14.31
18	2nd Floor B&G Closet	2600	1-Lamp CFL Pendant No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
2	2.1 - Elevator Lobby	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	5	0.31	930	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	690	0.08	240	$34	0	No New Controls	0	0.0%	0	$0	$725.00	$325.00	$1,050.00	$250.00	23.81	$0.00	$0.00	$0.00	FALSE	-
6	240F - Conference Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	1	0.09	242	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	143	0.04	99	$14	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	29	$4	$210.00	$65.00	$275.00	$50.00	16.27	$50.00	$50.00	$100.00	FALSE	24.98
6	240E - Conference Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	1	0.09	242	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	143	0.04	99	$14	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	29	$4	$210.00	$65.00	$275.00	$50.00	16.27	$50.00	$50.00	$100.00	FALSE	24.98

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
10	B2.1 - Men's R.R.	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	25	$3	$130.00	$65.00	$195.00	$50.00	28.45	$50.00	$50.00	$100.00	FALSE	28.62
19	Closet Next to B2.1	2600	1-Lamp Inc. Screw Type No Lens	1	60	1	0.06	156	Re-Lamp	Philips A19 LED Lamp 8w	1	8	1	0.01	21	0.05	135	$19	0	No New Controls	0	0.0%	0	$0	$20.00	$16.25	$36.25	$20.00	0.86	$0.00	$0.00	$0.00	FALSE	-
10	B2.2 - Women's R.R.	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	25	$3	$130.00	$65.00	$195.00	$50.00	28.45	$50.00	$50.00	$100.00	FALSE	28.62
2	2.2 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$20	0	No New Controls	0	0.0%	0	$0	$435.00	$195.00	$630.00	$150.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	2.3 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$60	0	No New Controls	0	0.0%	0	$0	$1,305.00	$585.00	$1,890.00	$450.00	23.81	$0.00	$0.00	$0.00	FALSE	-
1	243 - Conference Rm	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	4	0.25	645	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	478	0.06	166	$23	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	96	$13	$580.00	$260.00	$840.00	$200.00	27.47	$50.00	$50.00	$100.00	$20.00	5.97
12	B2.3 - Women's R.R.	2600	4-Lamp T8 F32 2x4 Surface Mount Prismatic	4	114	2	0.23	593	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24AC5-LD3-55-UNV-840-CD1-U	1	55	2	0.11	286	0.12	307	$43	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$350.00	$130.00	$480.00	$100.00	8.85	$50.00	$50.00	$100.00	FALSE	12.49
1	1.1 - First Floor Security Entrance	3000	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$54	0	No New Controls	0	0.0%	0	$0	$1,160.00	$520.00	$1,680.00	$400.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	1.2 - Elevator Lobby	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$54	0	No New Controls	0	0.0%	0	$0	$1,160.00	$520.00	$1,680.00	$400.00	23.81	$0.00	$0.00	$0.00	FALSE	-
14	1st Floor Closet	2600	1-Lamp CFL Surface Mount No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
2	1.3 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$54	0	No New Controls	0	0.0%	0	$0	$1,160.00	$520.00	$1,680.00	$400.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	1.4 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$13	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	1.5 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$40	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	1.6 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$13	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	150 - Sheriff's Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$50.00	$50.00	$100.00	FALSE	14.93
2	1.7 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$20	0	No New Controls	0	0.0%	0	$0	$435.00	$195.00	$630.00	$150.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	1.8 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$54	0	No New Controls	0	0.0%	0	$0	$1,160.00	$520.00	$1,680.00	$400.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	B1.7 - Men's R.R.	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$50.00	$50.00	$100.00	FALSE	14.93
29	Closet by B1.7	2600	1-Lamp Inc. Surface Mount No Lens (Doesn't Work)	1	0	1	0.00	0	Existing to Remain	No Change	1	0	0	0.00	0	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
2	B1.8 - Women's R.R.	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$50.00	$50.00	$100.00	FALSE	14.93
2	1.9 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	7	0.43	1,302	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	966	0.11	336	$47	0	No New Controls	0	0.0%	0	$0	$1,015.00	$455.00	$1,470.00	$350.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	0.1 - Elevator Lobby	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$40	0	No New Controls	0	0.0%	0	$0	$870.00	$390.00	$1,260.00	$300.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	B0.1 - Men's R.R.	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	322	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	239	0.03	83	$12	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	48	$7	$290.00	$130.00	$420.00	$100.00	27.47	$50.00	$50.00	$100.00	FALSE	14.93
2	0.2 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	10	0.62	1,860	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	1,380	0.16	480	$67	0	No New Controls	0	0.0%	0	$0	$1,450.00	$650.00	$2,100.00	$500.00	23.81	$0.00	$0.00	$0.00	FALSE	-
33	17A - Network Rm	2000	4-Lamp T8 2x4 Pendant Prismatic Lens	4	114	2	0.23	456	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24AC5-LD3-55-UNV-840-CD1-U	1	55	2	0.11	220	0.12	236	$33	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	44	$6	$350.00	$130.00	$480.00	$100.00	11.50	$50.00	$50.00	$100.00	$20.00	12.99
6	16 - Café	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	10	0.93	2,418	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	10	0.55	1,430	0.38	988	$138	0	No New Controls	0	0.0%	0	$0	$2,100.00	$650.00	$2,750.00	$500.00	16.27	$0.00	$0.00	$0.00	FALSE	-
6	16A - Café Hallway	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	1	0.09	242	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	143	0.04	99	$14	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	16.27	$0.00	$0.00	$0.00	FALSE	-
34	16A - Café Hallway	2600	3-Lamp T8 2x4 Recessed No Lens	3	93	1	0.09	242	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	143	0.04	99	$14	0	No New Controls	0	0.0%	0	$0	$210.00	$50.00	$260.00	$50.00	15.18	$0.00	$0.00	$0.00	FALSE	-
1	18D - Jury Rm	2600	2-Lamp T8-U 2x2 Recessed Parabolic Lens	2	62	12	0.74	1,934	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	12	0.55	1,435	0.19	499	$70	0	No New Controls	0	0.0%	0	$0	$1,740.00	$780.00	$2,520.00	$600.00	27.47	$0.00	$0.00	$0.00	FALSE	-
6	18A - Conference Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99
6	18B - Conference Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99

			EXISTING FIXTURES					PROPOSED FIXTURE RETROFIT						RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
6	18 - Sitting Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	16.27	$0.00	$0.00	$0.00	FALSE	-
2	18 - Sitting Rm	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	27.47	$0.00	$0.00	$0.00	FALSE	-
6	18C - Reception Area	3000	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$32	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	14.10	$0.00	$0.00	$0.00	FALSE	-
2	0.3 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$13	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	23.81	$0.00	$0.00	$0.00	FALSE	-
6	19A - Small Conference Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99
6	19B - Small Conference Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	2	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	198	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	57	$8	$420.00	$130.00	$550.00	$100.00	16.27	$50.00	$50.00	$100.00	$20.00	9.99
2	19C - Walk Way	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	186	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.02	48	$7	0	No New Controls	0	0.0%	0	$0	$145.00	$65.00	$210.00	$50.00	23.81	$0.00	$0.00	$0.00	FALSE	-
6	19D - Small Court Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	12	1.12	2,902	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	12	0.66	1,716	0.46	1,186	$166	0	No New Controls	0	0.0%	0	$0	$2,520.00	$780.00	$3,300.00	$600.00	16.27	$0.00	$0.00	$0.00	FALSE	-
2	0.3 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	5	0.31	930	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	690	0.08	240	$34	0	No New Controls	0	0.0%	0	$0	$725.00	$325.00	$1,050.00	$250.00	23.81	$0.00	$0.00	$0.00	FALSE	-
37	B0.5 - Women's R.R.	2600	2-Lamp T8 2' Surface Mount Prismatic Lens	2	33	2	0.07	172	Replace Fixture	1x2 Surface LED 2700 lumen 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	2	0.06	166	0.00	5	$1	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	33	$5	$220.00	$130.00	$350.00	$0.00	480.77	$50.00	$50.00	$100.00	FALSE	21.46
10	B0.5 - Women's R.R.	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	6	Dual Technology Occupancy Sensor - Switch Mnt.	0	20.0%	25	$3	$130.00	$65.00	$195.00	$50.00	28.45	$0.00	$0.00	$0.00	FALSE	0.00
30	026 - Closet	2600	1-Lamp CFL Surface Wall Mount No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
35	023 - Boiler Rm	2600	2-Lamp T8 2x4 Pendant No Lens	2	62	3	0.19	484	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	3	0.14	374	0.04	109	$15	0	No New Controls	0	0.0%	0	$0	$390.00	$195.00	$585.00	$0.00	38.27	$0.00	$0.00	$0.00	FALSE	-
36	023 - Boiler Rm	2600	2-Lamp T8 1x4 Surface Wall Mount No Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$0.00	38.27	$0.00	$0.00	$0.00	FALSE	-
18	023 - Boiler Rm	2600	1-Lamp CFL Pendant No Lens	1	21	5	0.11	273	Existing to Remain	No Change	1	21	0	0.11	273	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
69	023 - Boiler Rm	2600	1-Lamp 100W MH Pendant Clear Lens	1	122	2	0.24	634	Existing to Remain	No Change	1	122	0	0.24	634	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
70	023 - Boiler Rm	2600	1-Lamp 100W MH Ceiling Clear Lens	1	122	1	0.12	317	Existing to Remain	No Change	1	122	0	0.12	317	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
14	023A - Boiler Rm	2600	1-Lamp CFL Surface Mount No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
10	023A - Boiler Rm	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$50.00	28.45	$0.00	$0.00	$0.00	FALSE	-
32	023B - Boiler Rm	2600	2-Lamp T8 4' Surface Mount No Lens	2	62	2	0.12	322	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.03	73	$10	0	No New Controls	0	0.0%	0	$0	$260.00	$130.00	$390.00	$100.00	28.45	$0.00	$0.00	$0.00	FALSE	-
70	023B - Boiler Rm	2600	1-Lamp 100W MH Ceiling Clear Lens	1	122	3	0.37	952	Existing to Remain	No Change	1	122	0	0.37	952	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
11	023B - Boiler Rm	2600	2-Lamp T8 F32 4' Pendent Prismatic Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$50.00	28.45	$0.00	$0.00	$0.00	FALSE	-
6	050 - Break Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	6	0.56	1,451	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	858	0.23	593	$83	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	172	$24	$1,260.00	$390.00	$1,650.00	$300.00	16.27	$200.00	$50.00	$250.00	$35.00	8.95
6	27A - Women's Locker Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	6	0.56	1,451	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	858	0.23	593	$83	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	172	$24	$1,260.00	$390.00	$1,650.00	$300.00	16.27	$200.00	$50.00	$250.00	FALSE	10.41
2	0.4 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$54	0	No New Controls	0	0.0%	0	$0	$1,160.00	$520.00	$1,680.00	$400.00	23.81	$0.00	$0.00	$0.00	FALSE	-
2	051 - Server/Computer Rm	2000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	10	0.62	1,240	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	920	0.16	320	$45	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	184	$26	$1,450.00	$650.00	$2,100.00	$500.00	35.71	$400.00	$100.00	$500.00	$35.00	18.05
2	052 - Computer Rm	2000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	9	0.56	1,116	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	828	0.14	288	$40	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$23	$1,305.00	$585.00	$1,890.00	$450.00	35.71	$200.00	$50.00	$250.00	$35.00	9.27
2	052A - Office	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$50.00	$50.00	$100.00	FALSE	29.86
31	052B - Closet	2600	1-Lamp CFL Screw Type Surface Mount No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	11	$2	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	65.41
2	0.5 - Hallway	3000	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$20	0	No New Controls	0	0.0%	0	$0	$435.00	$195.00	$630.00	$150.00	23.81	$0.00	$0.00	$0.00	FALSE	-
72	Closet 0.1	2600	1-Lamp 4-Pin CFL 21W Wall Mount Prismatic Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
38	033A - Generator Rm	2600	2-Lamp T8 4' Pendant No Lens	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$50.00	28.45	$0.00	$0.00	$0.00	FALSE	-
10	033 - Storage Rm	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	4	0.25	645	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.06	146	$20	0	No New Controls	0	0.0%	0	$0	$520.00	$260.00	$780.00	$200.00	28.45	$0.00	$0.00	$0.00	FALSE	-
40	055 - Storage Rm	2600	1-Lamp CFL 1x1 Box Enclosure Surface Ceiling Mount Glass Lens	1	21	3	0.06	164	Existing to Remain	No Change	1	21	0	0.06	164	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
31	055 - Storage Rm	2600	1-Lamp CFL Screw Type Surface Mount No Lens	1	21	1	0.02	55	Existing to Remain	No Change	1	21	0	0.02	55	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
28	055 - Storage Rm	2600	1-Lamp Inc. Surface Ceiling Mount No Lens	1	60	1	0.06	156	Re-Lamp	Philips A19 LED Lamp 8w	1	8	1	0.01	21	0.05	135	$19	0	No New Controls	0	0.0%	0	$0	$20.00	$16.25	$36.25	$20.00	0.86	$0.00	$0.00	$0.00	FALSE	-
6	050 - Men's Locker Rm	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	5	0.47	1,209	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	5	0.28	715	0.19	494	$69	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	143	$20	$1,050.00	$325.00	$1,375.00	$250.00	16.27	$200.00	$50.00	$250.00	FALSE	12.49
2	050 - Men's Locker Rm	2600	2-Lamp T8-U 2x2 Recessed Prismatic Lens	2	62	1	0.06	161	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	120	0.02	42	$6	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	24	$3	$145.00	$65.00	$210.00	$50.00	27.47	$200.00	$50.00	$250.00	FALSE	74.65
10	B0.6 - Men's R.R.	2600	2-Lamp T8 F32 4' Surface Mount Prismatic Lens	2	62	2	0.12	322	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	250	0.03	73	$10	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	50	$7	$260.00	$130.00	$390.00	$100.00	28.45	$50.00	$50.00	$100.00	FALSE	14.31
42	Stairwell A	3000	1-Lamp T8 4' Surface Wall Mount Prismatic Lens	1	32	1	0.03	96	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	1	0.03	84	0.00	12	$2	0	No New Controls	0	0.0%	0	$0	$140.00	$65.00	$205.00	$0.00	122.02	$0.00	$0.00	$0.00	FALSE	-
41	Stairwell A	3000	1-Lamp T8 4' Surface Wall Mount Opaque Lens	1	32	9	0.29	864	Replace Fixture	4' LED Strip 3100 lumen 28w Cooper #SNLED-LD1-31-LC-UNV-840-CD1-U	1	28	9	0.25	756	0.04	108	$15	0	No New Controls	0	0.0%	0	$0	$1,260.00	$585.00	$1,845.00	$0.00	122.02	$0.00	$0.00	$0.00	FALSE	-
12	Stairwell A	3000	4-Lamp T8 F32 2x4 Surface Mount Prismatic	4	114	1	0.11	342	Replace Fixture	2x4 Surface LED 5800 lumen 55w Cooper #24AC5-LD3-55-UNV-840-CD1-U	1	55	1	0.06	165	0.06	177	$25	0	No New Controls	0	0.0%	0	$0	$175.00	$65.00	$240.00	$50.00	7.67	$0.00	$0.00	$0.00	FALSE	-
43	Stairwell B	3000	1-Lamp CFL 1x1 Recessed Prismatic Lens	1	21	15	0.32	945	Existing to Remain	No Change	1	21	0	0.32	945	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
44	Stairwell B	3000	1-Lamp Inc. Spot Light Surface Wall Mount No Lens	1	60	3	0.18	540	Re-Lamp	Philips A19 LED Lamp 8w	1	8	3	0.02	72	0.16	468	$66	0	No New Controls	0	0.0%	0	$0	$60.00	$48.75	$108.75	$0.00	1.66	$0.00	$0.00	$0.00	FALSE	-
45	Stairwell B	3000	1-Lamp 65W Spot Light Wall Mount No Lens	1	65	1	0.07	195	Re-Lamp	Philips A19 LED Lamp 8w	1	8	1	0.01	24	0.06	171	$24	0	No New Controls	0	0.0%	0	$0	$20.00	$16.25	$36.25	$0.00	1.51	$0.00	$0.00	$0.00	FALSE	-
46	Stairwell B	3000	1-Lamp Spot Light Wall Mount No Lens (No Bulb)	1	0	1	0.00	0	Existing to Remain	No Change	1	0	0	0.00	0	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
39	Elevator 1	2600	2-Lamp T8 2x4 Recessed Opaque Lens	2	62	3	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	429	0.02	55	$8	0	No New Controls	0	0.0%	0	$0	$630.00	$150.00	$780.00	$150.00	82.42	$0.00	$0.00	$0.00	FALSE	-
39	Elevator 2	2600	2-Lamp T8 2x4 Recessed Opaque Lens	2	62	3	0.19	484	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	429	0.02	55	$8	0	No New Controls	0	0.0%	0	$0	$630.00	$150.00	$780.00	$150.00	82.42	$0.00	$0.00	$0.00	FALSE	-
6	144	2600	3-Lamp T8 F32 2x4 Recessed Prismatic Lens	3	93	1	0.09	242	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	143	0.04	99	$14	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	16.27	$0.00	$0.00	$0.00	FALSE	-
48	144 - Mech Closet	2600	2-Lamp T8 4' Utility Pendant	2	62	1	0.06	161	Replace Fixture	1x4 Surface LED 4100 lumen 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	125	0.01	36	$5	0	No New Controls	0	0.0%	0	$0	$130.00	$65.00	$195.00	$50.00	28.45	$0.00	$0.00	$0.00	FALSE	-
50	Penthouse	2000	Screw In Pendant Fixture	1	21	5	0.11	210	Existing to Remain	No Change	1	21	0	0.11	210	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
51	Penthouse	2000	100W A Fixture	1	110	2	0.22	440	Re-Lamp	Philips A19 LED Lamp 8w	1	8	2	0.02	32	0.20	408	$57	0	No New Controls	0	0.0%	0	$0	$40.00	$32.50	$72.50	$40.00	0.57	$0.00	$0.00	$0.00	FALSE	-
52	Penthouse	2000	CFL 42W Fixture	1	42	3	0.13	252	Existing to Remain	No Change	1	42	0	0.13	252	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
73	Exterior	4000	1-Lamp T8 18" Recessed Wall Mount Opaque Lens Exterior	1	15	10	0.15	600	Existing to Remain	No Change	1	15	0	0.15	600	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
74	Exterior	4000	1-Lamp 250W MH Roof Mount Clear Lens	1	295	3	0.89	3,540	Replace Fixture	RAB Outdoor LED Spot 78w	1	78	3	0.23	936	0.65	2,604	$365	0	No New Controls	0	0.0%	0	$0	$1,770.00	$450.00	$2,220.00	$0.00	6.09	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					**1,335**	**101**	**266,386**					**1,167**	**63**	**167,245**	**37**	**99,141**	**$13,880**			**102**	**21**	**9,219**	**$1,291**	**$185,235**	**$75,255**	**$260,490**	**$51,550**	**15.053626**	**$9,650**	**$5,100**	**$14,750**	**$1,650.00**	**$10.15**

APPENDIX F

Location Description	Area (Sq FT)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Total KW_{AC}	Panel Weight (41.9 lbs)	W/SQFT
Court House	2400	SHARP ND-240QCJ	98	17.5	1,719	23.52	28,571	19.1	4,106	13.68

= Proposed PV Roof Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.

Project Name: **LGEA Solar PV Project - Court House**
Location: **Toms River, NJ**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$111,342
Annual kWh Production	28,571
Annual Energy Cost Reduction	$4,000
Average Annual SREC Revenue	$4,329

Simple Payback: **13.37** Years

Life Cycle Cost Analysis

Analysis Period (years):	15	Financing %:	100%
Discount Rate:	3%	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.140**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	6.00%	Average SREC Value ($/kWh)	$0.152

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$0	0	0	0	$0	0	0	0	0
1	$0	28,571	$4,000	$0	$7,143	$6,552	$4,723	($132)	($132)
2	$0	28,428	$4,120	$0	$7,107	$6,261	$5,014	($48)	($180)
3	$0	28,286	$4,244	$0	$7,072	$5,952	$5,323	$40	($140)
4	$0	28,145	$4,371	$0	$5,629	$5,623	$5,652	($1,275)	($1,415)
5	$0	28,004	$4,502	$288	$5,601	$5,275	$6,000	($1,461)	($2,875)
6	$0	27,864	$4,637	$287	$5,573	$4,905	$6,370	($1,352)	($4,227)
7	$0	27,725	$4,776	$286	$4,159	$4,512	$6,763	($2,626)	($6,853)
8	$0	27,586	$4,919	$284	$4,138	$4,094	$7,180	($2,502)	($9,355)
9	$0	27,448	$5,067	$283	$4,117	$3,652	$7,623	($2,373)	($11,728)
10	$0	27,311	$5,219	$281	$2,731	$3,181	$8,093	($3,606)	($15,334)
11	$0	27,174	$5,376	$280	$2,717	$2,682	$8,593	($3,462)	($18,796)
12	$0	27,038	$5,537	$278	$2,704	$2,152	$9,123	($3,313)	($22,108)
13	$0	26,903	$5,703	$277	$1,345	$1,590	$9,685	($4,504)	($26,612)
14	$0	26,769	$5,874	$276	$1,338	$992	$10,283	($4,338)	($30,950)
15	$0	26,635	$6,050	$274	$1,332	$358	$10,917	($4,167)	($35,117)
	Totals:	413,885	$74,395	$3,095	$62,705	$57,780	$111,342	($35,117)	($185,823)

Net Present Value (NPV) **($24,217)**

OCEAN COUNTY

ADMINISTRATION BUILDING

101 HOOPER AVENUE
TOMS RIVER, NJ 08753

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	General Service Secondary 3-Phase
Third Party Supplier:	Hess

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	General Service Large
Third Party Supplier:	Hess

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: JCP&L
Rate: General Service Secondary 3-Phase
Meter No: 28027768
Account No: 10-00-17-4223-28
Third Party Utility Provider: N/A
TPS Meter / Acct No: N/A

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Feb-13	94,800	194.3	$12,890
Mar-13	105,840	192.5	$13,890
Apr-13	118,200	295.1	$16,030
May-13	141,480	293.9	$19,131
Jul-13	175,800	300.5	$22,896
Jul-13	173,280	308.2	$22,638
Aug-13	166,320	304.0	$21,785
Sep-13	163,320	301.1	$21,805
Oct-13	142,560	286.6	$19,248
Nov-13	117,000	267.1	$16,003
Dec-13	113,160	191.9	$14,747
Jan-14	98,160	186.0	$12,745
Totals	**1,609,920**	**308.2 Max**	**$213,809**

AVERAGE DEMAND **260.1 KW average**
AVERAGE RATE **$0.133** **$/kWh**

Figure 1
Electricity Usage Profile

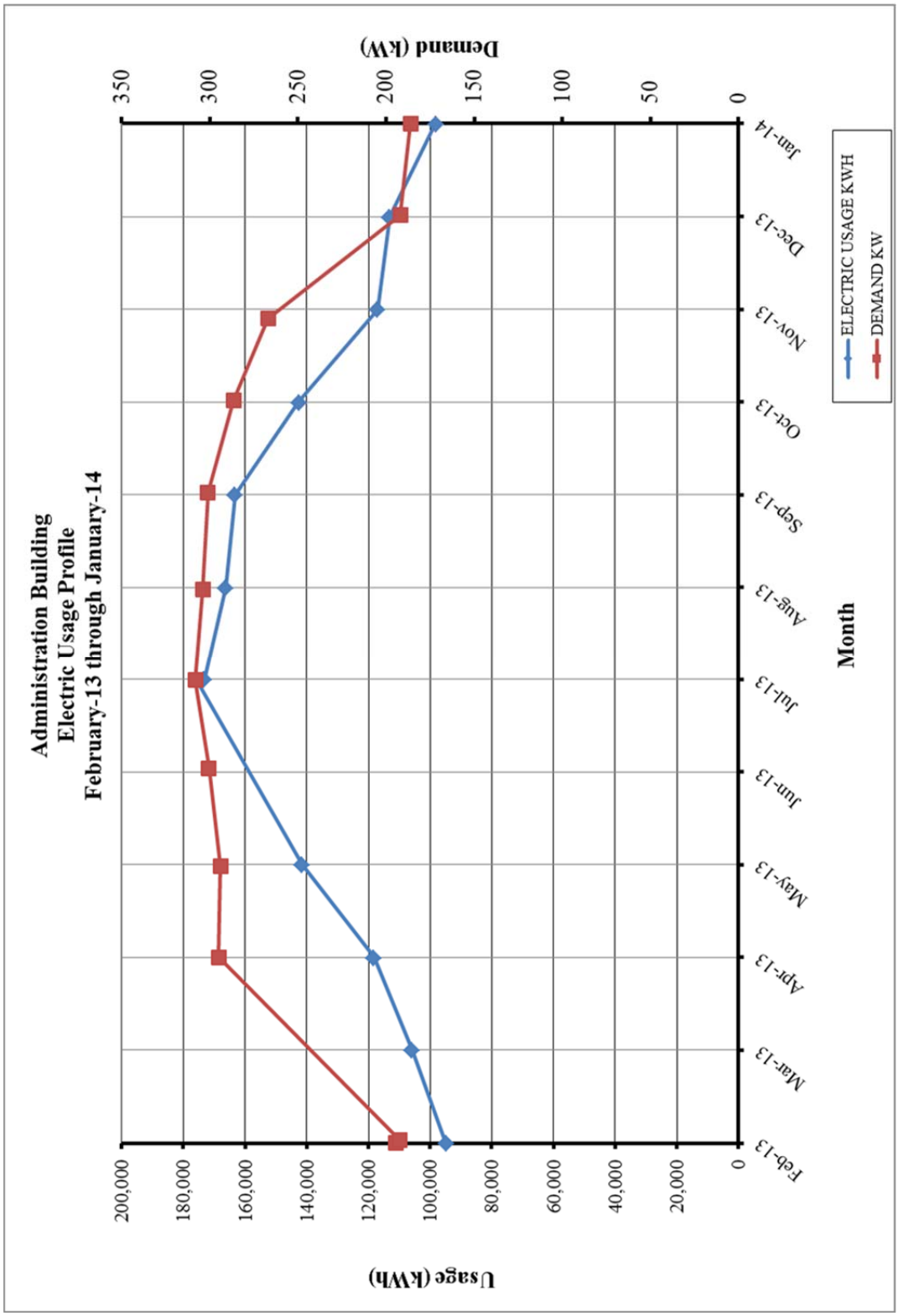
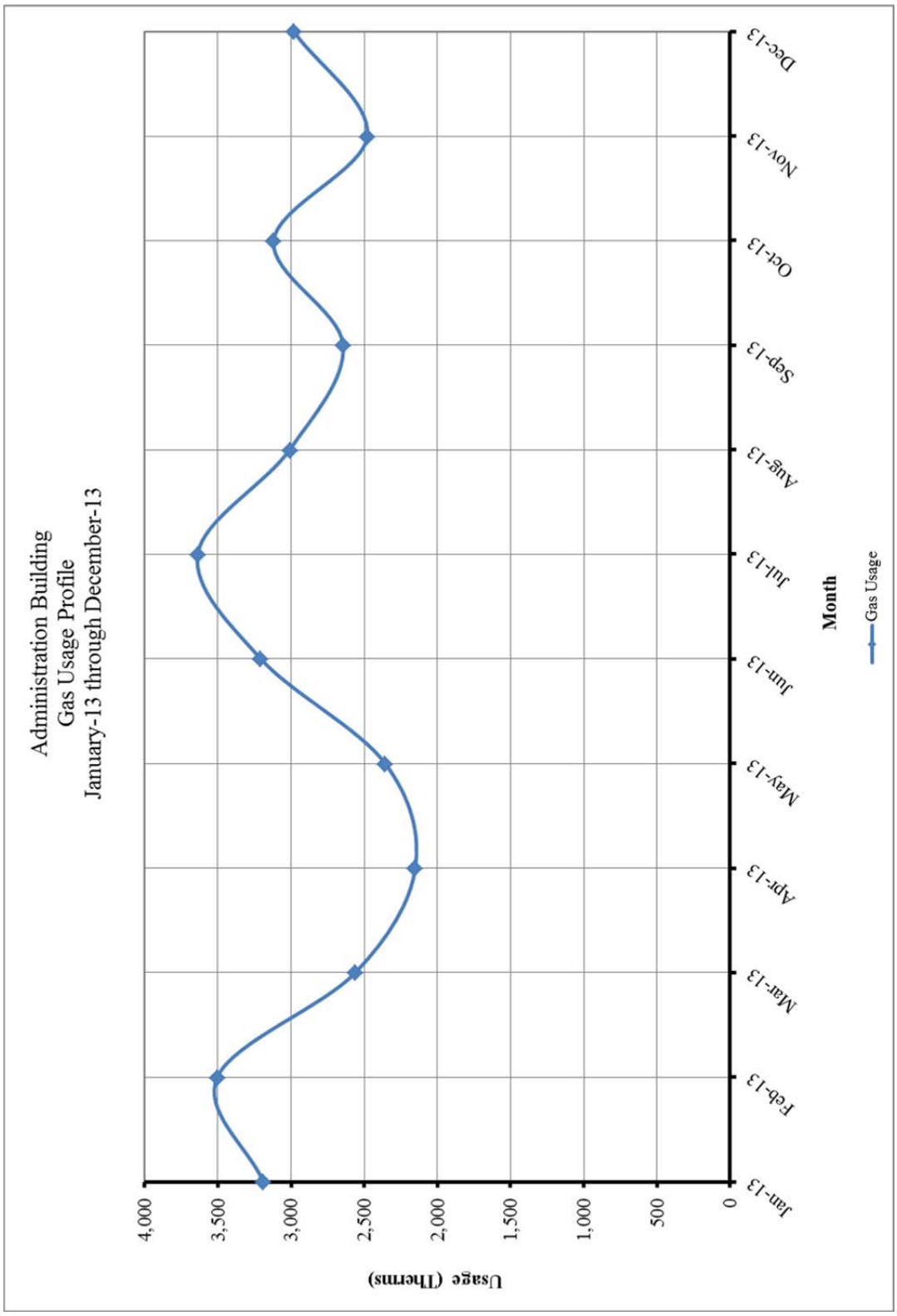


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: New Jersey Natural Gas		
Rate: GSL		
Meter No: 00893087		
Account No: 19-4510-0205-10		
Third Party Utility Provider: Hess		
TPS Meter No: -		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-13	3,191.00	$3,307.15
Feb-13	3,504.63	$3,606.56
Mar-13	2,559.48	$2,731.81
Apr-13	2,151.71	$2,444.27
May-13	2,359.06	$2,720.98
Jun-13	3,209.25	$3,655.97
Jul-13	3,638.38	$4,050.99
Aug-13	3,009.25	$3,297.20
Sep-13	2,645.62	$2,936.80
Oct-13	3,119.45	$3,402.21
Nov-13	2,479.72	$2,672.41
Dec-13	2,984.18	$3,310.47
TOTALS	**34,851.73**	**$38,136.82**
AVERAGE RATE:	**$1.09**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Administrative Building is located at 101 Hooper Avenue in Toms River, New Jersey. This 45,500 SF facility was built in 1973 with no additions. The building is a three story facility with a Basement level. The facility is comprised of offices and open office space, conference rooms, file storage, board room, break room, server room, restrooms, and utility rooms.

Occupancy Profile

The typical hours of operation for most of the facility are Monday through Friday between 8:00 am and 5:00 pm. There are approximately 120 employees that normally occupy the facility.

Building Envelope

Exterior walls for the building are masonry brick faced with a concrete block construction, rigid insulation, and finished dry wall interior. The windows throughout the facility are in very good condition. Typical windows are double pane operable, 1/4" with aluminum frames. The roof consists of a white coated rubber membrane built up.

HVAC Systems

The Administration Building is conditioned by a combination of perimeter fan coil units and two main air handlers connected to terminal variable air volume boxes. The fan coil units are manufactured by Enviro-Tec or Trane with cooling capacities of ½ ton or greater, and heating capacities of 15 MBH or greater. Air handling unit (AH-1) supplies the basement and first floor is located in the basement mechanical room and is manufactured by Trane with 40 ton chilled water cooling coil and a constant volume 10 horsepower fan. Coupled with AH-1 is a single 3 horsepower return fan. Air handling unit (AH-2) supplies the second floor and third floor with 30 ton chilled water cooling coil and a constant volume 7 ½ horsepower fan. Coupled with AH-2 is a single 2 horsepower return fan. Both units supply variable airflow terminal boxes with modulating dampers and no reheat coils.

Heating hot water is supplied to the building from three natural gas fired condensing style boilers located in the basement. The units are manufactured by Aerco with an input capacity of 2 million Btu/h and thermal efficiencies of 88% or greater based on firing mode. Heating water is circulated by a single set of constant volume Bell & Gossett end suction pumps. Each pump has a 5 horsepower motor and flow rating of 260 gallons per minute at 51 feet of head pressure.

Chilled water is supplied to the building from a modular water-cooled scroll chiller with five 50 ton dual compressor modules for a total capacity of 250 tons. The combined module full load efficiency is estimated at 0.889 kW per ton of cooling. The chilled water is circulated by a single set of constant volume end suction pumps. Each pump has a 15 horsepower motor and flow rating of 480 gallons per minute at 80 feet of head pressure. The chiller system rejects heat to a single cell BAC cooling tower with a constant volume 40 horsepower fan. Condenser water is pumped from the basement to the rooftop cooling tower via a pair of constant volume pumps. Each pump has a 15 horsepower motor and flow rating 635 gallons per minute at 58 feet of head pressure.

Exhaust System

The facility has one general toilet exhaust fan rated at ¾ horsepower, and 3,010 CFM. There are additional fractional horsepower exhaust fans located in the mechanical penthouse and print shop.

HVAC System Controls

The Administration has multiple building management control systems both electronic and pneumatic. The pneumatic Honeywell control system operated the two main air handlers in the facility and attached terminal boxes. The compressed air for this system is provided by a single compressor located in the basement with a 2 horsepower motor. The fan coils on the 3rd floor are controlled by a Computrols XE series building automation system. The first, second floor, boiler system, and chiller system are controlled by a Trane Tracer Summit system with a local control panel in the basement. The three systems currently do not cross talk and independently control the assigned system components.

Domestic Hot Water

The restrooms and kitchenettes are provided domestic hot water by a single A.O. Smith electric hot water heater with integral storage. The heater has six 4.5 kilowatt elements and a 119 gallons storage tank.

Lighting

Refer to the Investment Grade lighting Audit Appendix for a detailed list of the lighting throughout the facility and estimated operating hours per space.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade	$143,500	$9,222	15.6	-3.6%
ECM #2	Lighting Controls	$18,945	$2,354	8.0	86.4%
ECM #3	Refrigerator Replacement	$930	$74	12.6	19.4%
ECM #4	DHW Heater Upgrade	$24,200	$2,042	11.9	26.6%
ECM #5	Premium Efficiency Motors	$21,000	$1,056	19.9	-24.6%
ECM #6	VFD Air Handler Fans	$77,288	$4,102	18.8	-20.4%
ECM #7	VFD Chilled Water Pumps	$39,000	$2,854	13.7	9.8%
ECM #8	VFD Cooling Tower Fan	$26,600	$6,487	4.1	265.8%
ECM #9	Water Conservation	$11,000	$2,964	3.7	169.5%
ECM #10	High Efficiency XFMR	$35,000	$3,039	11.5	56.3%
ECM #11	Central DDC	$180,000	$14,641	12.3	22.0%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	13 kW Roof Array	$66,222	$4,747	13.9	7.5%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
ECM #1	Lighting Upgrade	20.1	69,339	0
ECM #2	Lighting Controls	0.0	17,697	0
ECM #3	Refrigerator Replacement	0.0	558	0
ECM #4	DHW Heater Upgrade	0.0	21,766	-783
ECM #5	Premium Efficiency Motors	3.7	7,940	0
ECM #6	VFD Air Handler Fans	8.3	30,771	0
ECM #7	VFD Chilled Water Pumps	0.0	21,459	0
ECM #8	VFD Cooling Tower Fan	0.0	48,775	0
ECM #9	Water Conservation	0.0	13,896	0
ECM #10	High Efficiency XFMR	4.9	22,848	0
ECM #11	Central DDC	0.0	71,072	4,760
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
REM #1	13 kW Roof Array	11.1	16,686	0

Table 3
ECM Emissions Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	GREENHOUSE GAS EMISSIONS REDUCTION		
		CO_2 EMISSIONS (LBS)	NO_X EMISSIONS (LBS)	SO_2 EMISSIONS (LBS)
ECM #1	Lighting Upgrade	105,396	194	451
ECM #2	Lighting Controls	26,899	50	115
ECM #3	Refrigerator Replacement	848	2	4
ECM #4	DHW Heater Upgrade	23,923	54	141
ECM #5	Premium Efficiency Motors	12,069	22	52
ECM #6	VFD Air Handler Fans	46,772	86	200
ECM #7	VFD Chilled Water Pumps	32,618	60	139
ECM #8	VFD Cooling Tower Fan	74,138	137	317
ECM #9	Water Conservation	21,122	39	90
ECM #10	High Efficiency XFMR	34,729	64	149
ECM #11	Central DDC	163,721	243	462
Notes:	A. Emissions Reduction based on NJCEP published factors for electric & gas.			

Table 4
Facility Project Summary

FACILITY PROJECT SUMMARY TABLE					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade	$9,222	$187,000	$43,500	$143,500	15.6
Lighting Controls	$2,354	$21,000	$2,055	$18,945	8.0
Refrigerator Replacement	$74	$930	$0	$930	12.6
DHW Heater Upgrade	$2,042	$24,500	$300	$24,200	11.9
Premium Efficiency Motors	$1,056	$21,000	$0	$21,000	19.9
VFD Air Handler Fans	$4,102	$80,000	$2,713	$77,288	18.8
VFD Chilled Water Pumps	$2,854	$39,000	$0	$39,000	13.7
VFD Cooling Tower Fan	$6,487	$29,000	$2,400	$26,600	4.1
Water Conservation	$2,964	$11,000	$0	$11,000	3.7
High Efficiency XFMR	$3,039	$35,000	$0	$35,000	11.5
Central DDC	$14,641	$180,000	$0	$180,000	12.3
Total Project	**$48,835**	**$628,430**	**$50,968**	**$577,463**	**11.8**

Note the measure totals in this table do not take into account interactive effects of measures; see Method of Analysis Section III in Executive Report for further explanation.

The facility peak electrical demand and total project savings meet the qualifications for the Pay for Performance Program. If the owner were to pursue this program option they would receive an estimated $81,564 in incentive dollars, see the Installation Funding Options Section for more detail.

ECM #1: Lighting Upgrade – General

Description:

The majority of the interior lighting throughout Administration Building is provided with fluorescent fixtures with older generation, 32W T8 lamps and electronic ballasts. Although these T8 lamps are considered fairly efficient, further energy savings can be achieved by replacing the existing T8 lamps with new LED style fixtures. In addition to the fluorescent tube lamps there are additional fixture types consisting of metal halide lamps and incandescent lamps. These too can be retrofitted to LED style lamps.

This ECM includes retrofitting the interior lighting with new LED type fixtures, screw in lamps, and exterior lights. It is recommended the County consult with a professional engineer prior to retrofitting fixtures to ensure code required minimum light levels will be met. Additional savings may also be able to be found if it is discovered fixture quantities can be reduced.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	20.1
Electric Usage Savings (kWh)	69,339
Electric Cost Savings ($)	$9,222

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$187,000
NJ Smart Start Equipment Incentive ($):	$43,500
Net Installation Cost ($):	$143,500
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$9,222
Total Yearly Savings ($/Yr):	$9,222
Estimated ECM Lifetime (Yr):	15
Simple Payback	15.6
Simple Lifetime ROI	-3.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$138,332
Internal Rate of Return (IRR)	0%
Net Present Value (NPV)	($33,406.69)

ECM #2: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Administration Building are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for offices, conference rooms, and restrooms. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = \left(\%\ \text{Savings} \times \text{Controlled Light Energy}\ \left(\text{kWh/Yr}\right)\right)$$

$$\text{Savings.} = \text{Energy Savings}\left(\text{kWh}\right) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	17,697
Electric Cost Savings ($)	$2,354

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$21,000
NJ Smart Start Equipment Incentive ($):	$2,055
Net Installation Cost ($):	$18,945
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,354
Total Yearly Savings ($/Yr):	$2,354
Estimated ECM Lifetime (Yr):	15
Simple Payback	8.0
Simple Lifetime ROI	86.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$35,305
Internal Rate of Return (IRR)	9%
Net Present Value (NPV)	$9,152.76

ECM #3: Refrigerator Replacement

Description:

There are residential style refrigerators located in the basement employee break room, and IT room. These units are older models that are not nearly as energy efficient as one manufactured today.

The proposed replacement is a one-for-one with a unit of similar size and dimensions that has the most up-to-date Energy Star Rating. The models selected are manufactured by Frigidaire.

Energy Savings Calculations:

ENERGY STAR REFRIGERATOR CALCULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Quantity	2	2	
Manufacturer	Magic Chef, GE	Frigidaire	
Type	Top Freezer, Compact	Top Freezer, Compact	
Model	-	FFHT1715LW, FFPH44M4LB	
Size (Cu-Ft)	16.5, 3.7	16.5, 4.4	
Electric Rate ($/kWh)	$0.133	$0.133	
ENERGY SAVINGS CALCULATIONS			
Electric Usage (kWh)	1,235	677	558
Energy Cost ($)	$164	$90	$74
COMMENTS:	Calculations based Energy Star Website http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator		

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$930
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$930
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$74
Total Yearly Savings ($/Yr):	$74
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.6
Simple Lifetime ROI	19.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$1,110
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($46.59)

ECM #4: High Efficiency Gas Hot Water Heater

Description:

The Administration Building has a single electric hot water heater located in the basement mechanical room. The current unit is a six element heater with a storage capacity of 119 gallons and total electric input of 27 kilowatts. The unit is over 15 years and could be replaced with a much more efficient and cost effective natural gas fired domestic boiler.

This ECM will replace the domestic water heater with a Natural Gas fired 93% thermal efficient Bradford White EF series 60 gallon 150 MBH heater. The natural gas line will need to be extended from the adjacent boiler room, and venting can be extended from the heater out the side wall. (Before proceeding with installation of aforementioned system, Concord Engineering suggests consulting an engineer to evaluate the system fully.)

Energy Savings Calculations:

Energy Density for "Office" type building = 1.6 kBtu / SF / year

$$\text{DHW Heat Usage (kBtu)} = \text{Energy Density} \left(\frac{\frac{\text{kBtu}}{\text{yr}}}{\text{SF}} \right) \times \text{Building Area (SF)}$$

$$\text{DHW Total Usage} = \frac{\text{DHW Heat Usage (Btu)}}{\text{Heating Eff (\%)} \times \text{Fuel Heat Value} \left(\frac{\text{Btu}}{\text{Fuel Unit}} \right)}$$

$$\text{Energy Cost} = \text{Heating Fuel Usage (Fuel Units)} \times \text{Avg. Fuel Cost} \left(\frac{\$}{\text{Fuel Unit}} \right)$$

DOM. HOT WATER HEATER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Electric Hot Water Heater	High Efficiency Heater	
Building Type	Office		
Building Square-foot	45,500	45,500	
Domestic Water Usage, kBtu	72,800.00	72,800.00	
DHW Heating Fuel Type	Electric	Gas	
Heating Efficiency	98%	93%	-5%
Total Usage (kBTU)	74,286	78,280	-3,994
Electric Cost ($/kWh)	$ 0.133	$ -	
Nat Gas Cost ($/Therm)		$ 1.090	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	21,766	0	21,766
Natural Gas Usage (Therms)	0	783	-783
Energy Cost ($)	$2,895	$853	$2,042
COMMENTS:			

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$24,500
NJ Smart Start Equipment Incentive ($):	$300
Net Installation Cost ($):	$24,200
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,042
Total Yearly Savings ($/Yr):	$2,042
Estimated ECM Lifetime (Yr):	15
Simple Payback	11.9
Simple Lifetime ROI	26.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$30,630
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	$177.26

ECM #5: Premium Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving the pumps and fans in some of the HVAC equipment are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors.

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
AH-1	Supply Fan	10	3,600	85.5%	91.7%
RF-1	Return Fan	3	3,600	86.5%	89.5%
AH-2	Supply Fan	7.5	3,600	88.5%	91.0%
RF-2	Return Fan	2	3,600	84.0%	86.5%
HWP-3	Hot Water Pumps	5	2,745	85.0%	89.5%
HWP-4	Hot Water Pumps	5	2,745	85.0%	89.5%
CHWP-2	Chilled Water Pump	15	1,696	85.0%	91.7%
CWP-5	Condenser Water Pump	15	1,696	85.0%	91.7%
CWP-6	Condenser Water Pump	15	1,696	81.0%	91.7%
C-1	Compressor motor	2	1,500	84.0%	86.5%

Energy Savings Calculations:

$$\text{Electric Usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate} \left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	**QTY**	**MOTOR HP**	**LOAD FACTOR**	**EXISTING EFFICIENCY**	**PROPOSED EFFICIENCY**	**POWER SAVINGS kW**	**ENERGY SAVINGS kWH**	**COST SAVINGS**
AH-1	1	10	75%	85.5%	91.7%	0.44	1,601	$213
RF-1	1	3	75%	86.5%	89.5%	0.07	235	$31
AH-2	1	7.5	75%	88.5%	91.0%	0.13	471	$63
RF-2	1	2	75%	84.0%	86.5%	0.04	139	$19
HWP-3	1	5	75%	85.0%	89.5%	0.17	457	$61
HWP-4	1	5	75%	85.0%	89.5%	0.17	457	$61
CHWP-2	1	15	75%	85.0%	91.7%	0.72	1,230	$164
CWP-5	1	15	75%	85.0%	91.7%	0.72	1,230	$164
CWP-6	1	15	75%	81.0%	91.7%	1.21	2,061	$274
C-1	1	2	75%	84.0%	86.5%	0.04	58	$8
TOTAL						**3.7**	**7,940**	**$1,056**

There are no longer incentives available through NJ Smart Start for premium efficiency motors.

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$21,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$21,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,056
Total Yearly Savings ($/Yr):	$1,056
Estimated ECM Lifetime (Yr):	15
Simple Payback	19.9
Simple Lifetime ROI	-24.6%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$15,840
Internal Rate of Return (IRR)	-3%
Net Present Value (NPV)	($8,393.54)

ECM #6: Variable Frequency Drive Supply Fans

Description:

The air handlers' AH-1 and 2 in the basement and penthouse are not fitted with variable speed drives and continually operate at a constant speed. These units would benefit from the installation of a VFD and static pressure sensors to more efficiently operate the system. By installing VFD's on the remaining units the facility will be able to better balance the system air flows as well as operate at a reduced horsepower based on the fan curve required power.

This ECM would install a variable frequency drive controller, inverter duty rated motor (assuming they get installed through the premium efficiency motor ECM), and duct mounted static pressure sensor. (Recommend functional testing on all terminal VAV boxes to ensure optimal system performance)

Energy Savings Calculations:

Energy Savings were calculated utilizing the New Jersey Board of Public Utilities Protocols to Measure Resource Savings.

$$\text{Energy Savings (kWh)} = 0.746 \times \text{HP} \times \text{HRS} \times (\text{ESF}/\eta_{\text{motor}})$$

$$\text{Demand Savings (kW)} = 0.746 \times \text{HP} \times (\text{DSF}/\eta_{\text{motor}})$$

$$\text{Energy Savings Factor (ESF)} = 0.475 \text{ (Airfoil/Backward Inclined Fans)}$$

$$\text{Demand Savings Factor (DSF)} = 0.448 \text{ (Airfoil/Backward Inclined Fans)}$$

VARIABLE SPEED DRIVE SAVINGS CALCULATIONS									
EQMT ID	QTY	FUNCTION	MOTOR HP	HOURS OF OPERATION	PROPOSED EFFICIENCY	INSTALL VFD	DEMAND SAVINGS (KW)	ENERGY SAVINGS (KWH)	ENERGY COST SAVINGS
AH-1	1	Supply Fan	10	3,500	91.7%	Yes	3.6	13,525	$1,803
AH-2	1	Supply Fan	7.5	3,500	91.0%	Yes	2.8	10,222	$1,363
RF-1	1	Return Fan	3	3,500	89.5%	Yes	1.1	4,157	$554
RF-2	1	Return Fan	2	3,500	86.5%	Yes	0.8	2,868	$382
TOTAL	4						8.3	30,771	$4,102

NJ Smart Start Incentives for Variable Frequency Drives are available based on motor horsepower.

$$\$ \text{ Incentive} = \$155 \times \text{Horsepower (5 to} < 10 \text{ HP)}$$
$$\$ \text{ Incentive} = \$120 \times \text{Horsepower (10 to} < 20 \text{ HP)}$$
$$\$ \text{ Incentive} = \$65 \times \text{Horsepower (20} + \text{ HP)}$$

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$80,000
NJ Smart Start Equipment Incentive ($):	$2,713
Net Installation Cost ($):	$77,288
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,102
Total Yearly Savings ($/Yr):	$4,102
Estimated ECM Lifetime (Yr):	15
Simple Payback	18.8
Simple Lifetime ROI	-20.4%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$61,530
Internal Rate of Return (IRR)	-3%
Net Present Value (NPV)	($28,318.09)

ECM #7: VFD Chilled Water Pump

Description:

The Chilled Water System at Administration Building is currently outfitted with constant volume 15 horsepower pumps. The installation of variable speed drives will not only provide soft start capability on the pump system, but also allow the pumps to vary the flow based on chilled water demand in the system.

This ECM includes installation of two variable frequency drives with differential pressure controls. The pump motor will need to be replaced with a new inverter duty rated motors. In addition any three-way valves in the system will need to be changed to two-way valves.

Energy Savings Calculations:

$$\text{Pump Power HP} = \frac{\text{Flow}_{\text{GPM}} \times \text{Head}_{\text{ft-hd.}}}{3650 \times \eta_{\text{Pump}} \times \eta_{\text{motor}}}$$

$$\text{Energy Consumption (kWh)} = \text{Motor HP} \times 0.746 \frac{\text{kW}}{\text{HP}} \times \text{Hours of operation (Hr)} \times \frac{1}{\eta_{\text{motor}}}$$

$$\text{Total Energy Consumption (kWh)} = \sum \text{Energy Consumption of Each Motor}$$

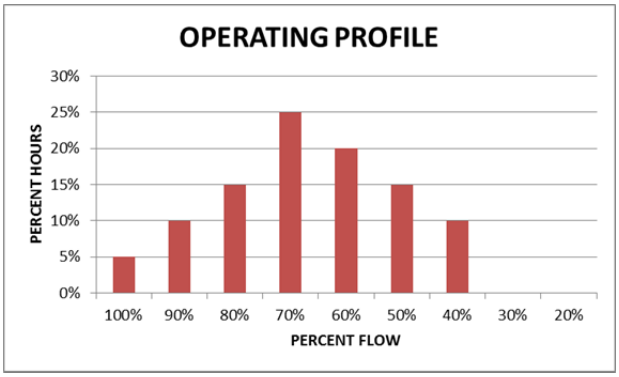
$$\text{Energy Cost (\$)} = \text{Total Comsumption(kWh)} \times \text{Average Cost of Electric} \left(\frac{\$}{\text{kWh}}\right)$$

Affinity Laws are used in order to calculate energy savings by calculating the reduced power consumption requirement based a reduction in flow. Affinity laws, are as following:

Q = Flow, n = RPM, p = total pressure

$$\frac{Q_2}{Q_1} = \frac{n_2}{n_1} \qquad \frac{p_2}{p_1} = \left(\frac{n_2}{n_1}\right)^2 \qquad \frac{HP_2}{HP_1} = \left(\frac{n_2}{n_1}\right)^3$$

Estimated Operating Profile with VFD



CHILLER WATER PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	Throttle	VFD	-
Motor Nameplate HP	15.0	15.0	
Flow (GPM)	480	480	-
Head (Ft)	80	80	-
Pump Efficiency (%)	75.0%	75.0%	-
Motor Efficiency (%)	91.7%	91.7%	0.0%
Operating Hrs	3000	3000	-
Estimated Power (HP)	14.1	14.1	0.00
Elec Cost ($/kWh)	0.133	0.133	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	34,411	12,952	21,459
Electric Energy Cost ($)	$4,577	$1,723	$2,854
COMMENTS:			

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$39,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$39,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,854
Total Yearly Savings ($/Yr):	$2,854
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.7
Simple Lifetime ROI	9.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$42,810
Internal Rate of Return (IRR)	1%
Net Present Value (NPV)	($4,929.13)

ECM #8: Install VFD on Cooling Tower Fan

Description:

The BAC cooling tower on the Administration Building roof currently has a 40 horsepower constant speed fan. The installation of a VFD will allow the tower fan to modulate based on the required amount airflow needed to maintain the necessary condenser water temperature for the chiller.

This ECM includes the installation of a variable frequency drive and inverter duty premium efficiency motor on the tower fan along with the required tower controls to modulate the fan speed.

Energy Savings Calculations:

Load Factor = 75% (without VFD)

$$\text{Energy Consumption (kWh)} = \text{Motor HP} \times 0.746\frac{\text{kW}}{\text{HP}} \times \text{Hours of operation (Hr)} \times \frac{1}{\eta_{\text{motor}}}$$

$$\text{Total Energy Consumption (kWh)} = \sum \text{Energy Consumption of Each Motor}$$

$$\text{Energy Cost (\$)} = \text{Total Comsumption(kWh)} \times \text{Average Cost of Electric} \left(\frac{\$}{\text{kWh}}\right)$$

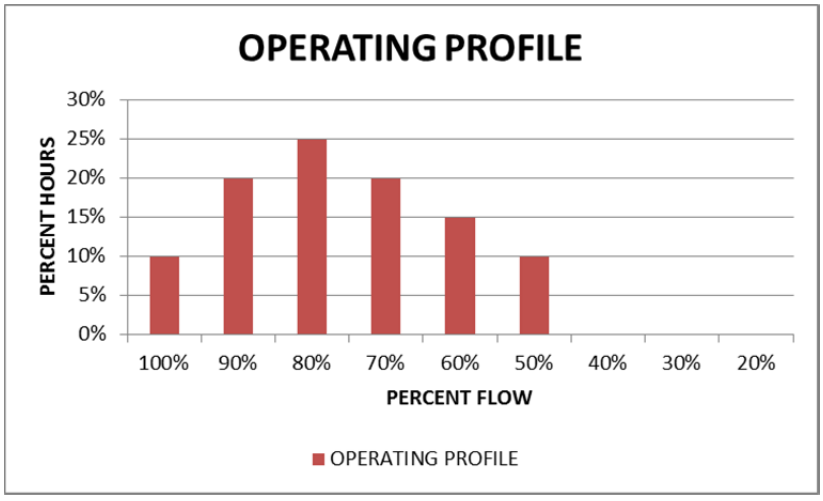
Affinity Laws are used in order to calculate energy savings by calculating the reduced power consumption requirement based a reduction in flow. Affinity laws, are as following:

Q = Flow, n = RPM, p = total pressure

$$\frac{Q_2}{Q_1} = \frac{n_2}{n_1} \qquad \frac{p_2}{p_1} = \left(\frac{n_2}{n_1}\right)^2 \qquad \frac{HP_2}{HP_1} = \left(\frac{n_2}{n_1}\right)^3$$

COOLING TOWER FAN VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Constant Fan	VFD Fan	
Control	On/Off	VFD	-
Quantiy of Fans	1	1	
Motor Nameplate HP	40.0	40.0	-
Motor Efficiency (%)	94.1%	94.1%	0.0%
Operating Hrs	3000	3000	-
Load Factor	75.0%	75.0%	
Elec Cost ($/kWh)	$0.133	$0.133	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	95,133	46,358	48,775
Electric Energy Cost ($)	$12,653	$6,166	$6,487
COMMENTS:			

Estimated Operating Profile with VFD



Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$29,000
NJ Smart Start Equipment Incentive ($):	$2,400
Net Installation Cost ($):	$26,600
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$6,487
Total Yearly Savings ($/Yr):	$6,487
Estimated ECM Lifetime (Yr):	15
Simple Payback	4.1
Simple Lifetime ROI	265.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$97,305
Internal Rate of Return (IRR)	23%
Net Present Value (NPV)	$50,841.38

ECM #9: Water Conservation

Description:

The facility utilizes standard plumbing fixtures. The typical sink aerator consumption is 2.2 gallons per minute. New fixtures and aerators are available that use less water that can add up to significant water reduction over a long period.

This ECM includes the replacement of the existing restroom sinks with new low flow sinks rated at 0.5 gallons per minute and fitted with time based automatic shut off. The existing quantity of sink estimated is based off observed quantity in the field and available drawings.

Equipment Basis of Design

- Moen Model 8886 (Chrome)

Energy Savings Calculations:

Energy savings calculations are based on NJ BPU Protocols to Measure Resource Savings. Hot water savings are based on a 50% mix of hot water to cold water. Savings for installation of automatic shut off based on a 10% reduction of use per day.

Faucets:

$$\text{Water Use (Gallons)} = \text{Fixture Qty} \times \frac{\text{Hours}}{\text{Day}} \times \frac{\text{Days}}{\text{Year}} \times \text{Flow Rate} \left(\frac{\text{Gal}}{\text{Min}}\right) \times 60 \frac{\text{Min}}{\text{hr}}$$

$$\text{Water Heating Usage (kWh)} = \frac{\text{Gallons}}{\text{year}} \times 8.33 \frac{\text{Btu}}{\text{gal}} \times \Delta\text{T (50°F)} \times \frac{1}{\text{Heater Eff (98\%)}} \times \frac{\text{kW}}{3412\ \text{Btu}}$$

$$\text{Water Heating Usage (therm)} = \frac{\text{Gallons}}{\text{year}} \times 8.33 \frac{\text{Btu}}{\text{gal}} \times \Delta\text{T (50°F)} \times \frac{1}{\text{Heater Eff (80\%)}} \times \frac{\text{therm}}{100{,}000\ \text{Btu}}$$

LOW FLOW WATER SAVING DEVICES			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Quantity of Sinks	17	17	
Flow Rate (GPM)	2.2	0.5	1.7
Device Usage (min per day)	30	27	
Facility Operation (days / year)	250	250	
Heat Content of Water (Btu/gal/°F)	8.33	8.33	
Temperature Rise (°F)	50.0	50.0	
Water Heater Type	Electric	Electric	
Efficiency of Heating System (%)	98%	98%	
Conversion Factor for Electric	3412	3412	
Conversion Factor for Gas	100000	100000	
Electric Rate ($/kWh)	$0.133	$0.133	
Natural Gas Rate ($/therm)	$1.090	$1.090	
Water Rate ($/1000gal)	$5.000	$5.000	
ENERGY SAVINGS CALCULATIONS			
Electric Usage (kWh)	17,470	3,573	13,896
Natural Gas Usage (Therm)	0	0	0
Water Usage (gallons)	280,500	57,375	223,125
Energy Cost ($)	$3,726	$762	$2,964
COMMENTS:	Heating Savings based on 50% Hot Cold Mix. Assume a 10% reduction based on timed faucet controls		

Energy Savings Summary:

ECM #9 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$11,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$11,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,964
Total Yearly Savings ($/Yr):	$2,964
Estimated ECM Lifetime (Yr):	10
Simple Payback	3.7
Simple Lifetime ROI	169.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$29,640
Internal Rate of Return (IRR)	24%
Net Present Value (NPV)	$14,283.52

ECM #10: High Efficiency Transformers

Description:

Electrical distribution transformers play a key role in delivering electrical power to buildings as all the electrical power supplied to the building flows through them. Whether equipment is plugged in and turned on or not transformers continue to operate. Consider their impact on electricity consumption. Some transformers waste as much as 20% of billed electricity.

Older transformers in existing buildings may not have been built to meet the load requirements of today. Over the years electrical distribution has changed very little, however the connected equipment has changed dramatically. This dramatic change is derived from both the type of equipment (mostly electronic in nature) and the density of installed equipment. The impact of this change has had a direct impact on power quality and transformer efficiency.

When newer electronic equipment is introduced into buildings with older electrical systems power quality and transformer efficiency can suffer. According to a Department of Energy study performed in 1996 electronic equipment can increase losses by as much as 2.7 times. In real terms this would mean that a transformer that has a name- plate efficiency of 97% in reality is operating closer to 90% or lower. The difference represents additional costs to operate the transformer. Replacing your older transformers with Power smiths energy efficient E-Saver-C3 or T1000-C3 transformers can improve the reliability of your electronic equipment and significantly reduce electricity waste.

Power smith's energy efficient transformers have substantially lower losses (higher efficiency) than other transformers. These energy savings mean less kilowatt-hours (kWh) consumed and lower energy bills. Electricity demand charges also decline, thanks to reduced energy losses. These savings pay for the transformer many times over its installed life.

There are three transformers located in the basement rated at 30, 70, and 150 kVA. Two of these units appear to be over twenty years old, along with one around 10 years old. Based on the ages of these transformers upgrading them up to today standards could reduce losses significantly.

Energy Savings Calculations:

See **Appendix** for Manufacturers Transformer Calculation Spreadsheet.

TRANSFORMER SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	4.9
Electric Usage Savings (kWh)	22,848
Electric Cost Savings ($)	$3,039

Energy Savings Summary:

ECM #10 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$35,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$35,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$3,039
Total Yearly Savings ($/Yr):	$3,039
Estimated ECM Lifetime (Yr):	18
Simple Payback	11.5
Simple Lifetime ROI	56.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$54,702
Internal Rate of Return (IRR)	5%
Net Present Value (NPV)	$6,796.93

ECM #11: Digital Energy Management System (DDC EMS)

Description:

The Administration Building has a variety of control systems that are do not communicate with one another. By converting the pneumatic Honeywell controls over to DDC and integrating the Trane Tracer and Computrols Systems into one open protocol type building management front end, significant savings could be realized through more efficient equipment operation and improved maintenance response.

This ECM includes installation of a Building Automation system to include control of the HVAC equipment in the facility. The system will include new air handler controls, new thermostats, new fan coil controls, exhaust fan on/off controllers, a front end computer and main controller. With the communication between the control devices and the front end computer interface, the facility manager will be able to take advantage of scheduling for occupied and unoccupied periods based on the actual occupancy of each space in the facility. Due to the fact that the facility has diverse hours of occupancy, including evening and weekend activities, having supervisory control over all of the equipment makes sense. The DDC system will also aid in the response time to service / maintenance issues when the facility is not under normal maintenance supervision, i.e. after-hours.

The Central DDC system installation has the potential to provide significant savings by controlling the HVAC systems as a whole and provide operating schedules and features such as space averaging, night set-back, temperature override control, etc. The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the referenced report:

- Energy Management and Control System Savings: 5%-15%.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 15% of the electricity and 15% for the gas utility in this building.

The basis for the DDC system expansion is the Andover Energy Management System or similar. (Note: There are currently no NJ OCE incentives for HVAC controls upgrades.)

Energy Savings Calculations:

Energy savings for each utility is calculated with the equation below.

$$\text{Energy Savings (Utility)} = \text{Current Energy Consumption} \times \text{Estimated Savings, \%}$$

Following table summarizes energy savings for this facility via implementation of an Energy Management System:

CONTROLS SAVINGS CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
HVAC Usage Electric (kBtu)	1,616,659	1,374,160	242,499
HVAC Usage Gas (kBtu)	3,173,654	2,697,606	476,048
Savings Percentage	-	15.0%	
Electric Site Conversion (kWh/kBtu)	3.412	3.412	
Gas Site Conversion (Therm/kBtu)	100.0	100.0	
Electric Cost ($/kWh)	$0.133	$0.133	
Gas Cost ($/Gallon)	$1.090	$1.090	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	473,816	402,743	71,072
Gas Usage (Therms)	31,737	26,976	4,760
Energy Cost ($)	$97,610	$82,969	$14,642
COMMENTS:			

Energy Savings Summary:

ECM #11 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$180,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$180,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$14,641
Total Yearly Savings ($/Yr):	$14,641
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.3
Simple Lifetime ROI	22.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$219,615
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	($5,216.69)

REM #1: 13 kW Solar System

Description:

The Administration Building has a small amount of available roof space that can be utilized for a small 13 kilowatt solar array. The array will produce approximately 16,686 kilowatt-hours annually that will reduce the overall electric usage of the facility by 1.04%. The owner should consult a structural engineer prior to installing any solar array to insure the roof can accommodate the additional weight.

Energy Savings Calculations:

See **Renewable / Distributed Energy Measures Calculations Appendix** for detailed financial summary and proposed solar layout areas. Financial results in table below are based on 100% financing of the system over a fifteen year period.

Energy Savings Summary:

REM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$66,222
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$66,222
Maintenance Savings ($/Yr):	$2,528
Energy Savings ($/Yr):	$2,219
Total Yearly Savings ($/Yr):	$4,747
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.9
Simple Lifetime ROI	7.5%
Simple Lifetime Maintenance Savings	$37,920
Simple Lifetime Savings	$71,208
Internal Rate of Return (IRR)	0.9%
Net Present Value (NPV)	($9,549.91)

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures. While facility staff may already perform some of these items, they are stated to remind the owner of the energy savings benefit of continual performance. These measures are typically not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode.

F. Install smart or occupancy controlled power strips to reduce idle power draw of shutdown equipment, or shutdown nonessential work station equipment while users are not present in offices.

G. Replace any old CRT Monitors with LED/LCD Type Monitors, which can draw as much as a quarter the power of an equivalent CRT monitor.

H. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Ocean County - Administration Building (101 Hooper)

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade	$142,000	$45,000	$43,500	$143,500	$9,222	$0	$9,222	15	$138,332	$0	-3.6%	15.6	-0.46%	($33,406.69)
ECM #2	Lighting Controls	$16,000	$5,000	$2,055	$18,945	$2,354		$2,354	15	$35,305	$0	86.4%	8.0	9.02%	$9,152.76
ECM #3	Refrigerator Replacement	$930	$0	$0	$930	$74	$0	$74	15	$1,110	$0	19.4%	12.6	2.30%	($46.59)
ECM #4	DHW Heater Upgrade	$14,000	$10,500	$300	$24,200	$2,042	$0	$2,042	15	$30,630	$0	26.6%	11.9	3.10%	$177.26
ECM #5	Premium Efficiency Motors	$12,000	$9,000	$0	$21,000	$1,056	$0	$1,056	15	$15,840	$0	-24.6%	19.9	-3.33%	($8,393.54)
ECM #6	VFD Air Handler Fans	$40,000	$40,000	$2,713	$77,288	$4,102	$0	$4,102	15	$61,530	$0	-20.4%	18.8	-2.72%	($28,318.09)
ECM #7	VFD Chilled Water Pumps	$20,000	$19,000	$0	$39,000	$2,854	$0	$2,854	15	$42,810	$0	9.8%	13.7	1.19%	($4,929.13)
ECM #8	VFD Cooling Tower Fan	$15,000	$14,000	$2,400	$26,600	$6,487	$0	$6,487	15	$97,305	$0	265.8%	4.1	23.34%	$50,841.38
ECM #9	Water Conservation	$4,500	$6,500	$0	$11,000	$2,964	$0	$2,964	10	$29,640	$0	169.5%	3.7	23.75%	$14,283.52
ECM #10	High Efficiency XFMR	$25,000	$10,000	$0	$35,000	$3,039	$0	$3,039	18	$54,702	$0	56.3%	11.5	5.19%	$6,796.93
ECM #11	Central DDC	$125,000	$55,000	$0	$180,000	$14,641	$0	$14,641	15	$219,615	$0	22.0%	12.3	2.60%	($5,216.69)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	13 kW Roof Array	$39,733	$26,489	$0	$66,222	$2,219	$2,528	$4,747	15	$71,208	$37,920	7.5%	13.9	0.92%	($9,549.91)

Notes: 1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

Concord Engineering Group, Inc.

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SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives from July 1, 2013 to June 30, 2014:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Cooling

Gas Absorption Chillers	$185 - $450 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $92 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

Closed Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps ≥ 20 hp	$60 per VFD rated hp
Rotary Screw Air Compressors ≥ 25 hp	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot (For fixtures ≥ 150w)	$25 per fixture
HID ≥ 100w Replace with new induction fixture. (must be 30% less watts/fixture than HID system)	$70 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Stairwell and Passageway Luminaires	$40 per fixture
LED Bollard Fixtures	$50 per fixture
Luminaires for Ambient Lighting of Interior Commercial Spaces (1x4, 2x2, 2x4)	$50 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$10 per lamp for R/PAR20,MR/PAR16,Globe,Candelabra or Misc $20 per lamp for R/BR/PAR 30, R/BR/PAR 38-40, A-Lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted (Existing Facilities Only)	$20 per control
Remote Mounted (Existing Facilities Only)	$35 per control
Daylight Dimming Controls	$45 per fixture controlled
Occupancy Based hi-low Dimming Control	$35 per fixture controlled
Occupancy Sensor Remote Mounted	$35 per control

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and an IRR of at least 10%.

APPENDIX C

ENERGY STAR® Statement of Energy Performance

Administration Building

Primary Property Function: Office
Gross Floor Area (ft²): 45,500
Built: 1973

For Year Ending: December 31, 2013
Date Generated: May 08, 2014

4

ENERGY STAR® Score[1]

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Administration Building 101 Hooper Avenue Toms River, New Jersey 08753	Ocean County 239 Washington Street Building #5 Toms River, NJ 08753 (____)____-_____	Joseph Meyers 239 Washington Street Building #5 Toms River, NJ 08753 732-929-2039 JosephMeyers@co.ocean.nj.us

Property ID: 4046881

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
191.1 kBtu/ft²

Source EUI
438.6 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	3,513,707 (40%)
Electric - Grid (kBtu)	5,180,453 (60%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	96.9
National Median Source EUI (kBtu/ft²)	222.5
% Diff from National Median Source EUI	97%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	842

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Split System Units

Tag	CU		
Unit Type	Condensing Unit		
Qty	1		
Location	Basement Entry		
Area Served			
Manufacturer	Sanyo		
Model #	CL2432		
Serial #	0006453		
Cooling Type	DX (R-22)		
Cooling Capacity (Tons)	2		
Cooling Efficiency (SEER/EER)			
Heating Type	N/A		
Heating Input (MBH)	N/A		
Efficiency	N/A		
Fuel	N/A		
Approx Age	9		
ASHRAE Service Life	15		
Remaining Life	6		
Comments	208/230V 1P		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

AHUs

Tag	FCU-61	FCU	AH-1
Unit Type	Fan Coil	Fan Coil	Indoor Air Handler
Qty	3	81	1
Location	304 Conference	Perimeter Spaces	Basememt Mech
Area Served	304 Conference	Perimeter Spaces	Basement & 1st Flr
Manufacturer	Envirotec	Envirotec	Trane
Model #	VFE	VFE	M-25
Serial #	FCU051117-01P20	-	-
Cooling Type	Chilled Water	Chilled Water	Chilled Water
Cooling Capacity (Tons)	0.5		40.0
Cooling Efficiency (EER)	N/A	N/A	N/A
Heating Type	Hot Water	Hot Water	N/A
Heating Input (MBH)	8.5		N/A
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	0.04	-	10.00
Approx Age	9	9	
ASHRAE Service Life	20	20	20
Remaining Life	11	11	20
Comments	2-Way Valve 115V1P	2-Way Valve 115V1P	1200 OA, 11910 CFM

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	AH-2	UH-1, 2	AC-1, 2
Unit Type	Indoor Air Handler	Unit Heater	Server Room Unit
Qty	1	2	2
Location	Roof Penthouse	Roof Penthouse	Server Room 25-1
Area Served	2nd & 3rd flr	Penthouse	Server Room 25-1
Manufacturer	Trane	Trane	Liebert
Model #	M-17	-	FE192G-A00
Serial #	K4E201688	-	108687A
Cooling Type	Chilled Water	N/A	DX (R-22)
Cooling Capacity (Tons)	30.0	N/A	15.0
Cooling Efficiency (EER)	N/A	N/A	8.6 EER
Heating Type	N/A	Hot Water	Electric Reheat
Heating Input (MBH)	N/A	62.5	19 kW
Heating Efficiency (%)	N/A	N/A	N/A
Supply Fan (HP)	7.50		5.00
Approx Age			28
ASHRAE Service Life	20	20	20
Remaining Life			(8)
Comments	3-Way CHW, 8160 CFM, 800 OA		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

AHUs

Tag	WFCU-1	UH-3
Unit Type	Wall Mini-Split	Unit Heater
Qty	1	1
Location	Server Storage Room	Elevator Penthouse
Area Served	Server Storage Room	Elevator Penthouse
Manufacturer	Sanyo	Trane
Model #	KS2432A	UHHA-E8A10GH
Serial #	0035253	90637
Cooling Type	DX (R-22)	N/A
Cooling Capacity (Tons)	2.0	N/A
Cooling Efficiency (EER)	-	N/A
Heating Type	N/A	Electric
Heating Input (MBH)	N/A	10 kW
Heating Efficiency (%)	N/A	98%
Supply Fan (HP)	-	-
Approx Age	9	20
ASHRAE Service Life	15	15
Remaining Life	6	(5)
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Domestic Water Heaters

Tag	HWH-1		
Unit Type	6 Element Storage Heater		
Qty	1		
Location	Basement Mech		
Area Served	Whole Building		
Manufacturer	A.O. Smith		
Model #	DRE 120A 917		
Serial #	LH97-0671868-917		
Size (Gallons)	119		
Input Capacity (MBH/KW)	27 kW		
Recovery (Gal/Hr)	-		
Efficiency %	98%		
Fuel	Electric		
Approx Age	17		
ASHRAE Service Life	15		
Remaining Life	(2)		
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Boilers

Tag	B-1 to 3	
Unit Type	Condensing Boiler	
Qty	3	
Location	Basement Mech	
Area Served	Building Heating Hot Water	
Manufacturer	Aerco	
Model #	BMK-2.0LN	
Serial #		
Input Capacity (Btu/Hr)	2,000,000	
Rated Output Capacity (Btu/Hr)	1,760,000	
Approx. Efficiency %	88%	
Fuel	Natural Gas	
Approx Age	6	
ASHRAE Service Life	25	
Remaining Life	19	
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Chiller

Tag	CH-1		
Unit Type	Modular Water-Cooled Chillers		
Qty	5		
Location	Basement Mech		
Area Served	Bldg Chilled Water		
Manufacturer	Multi-Stack		
Model #	MS50Z6H2W		
Serial #	-		
Refrigerant			
Cooling Capacity (Tons)	50		
Cooling Efficiency (KW/Ton)	0.889		
Volts / Phase / Hz	460V/3/60		
Fuel	Electric		
Chilled Water GPM / ΔT	480 GPM, 10 dT		
Condenser Water GPM / ΔT	635 GPM, 10 dT		
Approx Age	6		
ASHRAE Service Life	20		
Remaining Life	14		
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Cooling Tower

Tag	CT-1		
Unit Type	Open Tower		
Qty	1		
Location	Roof		
Area Served	Chiller		
Manufacturer	BAC		
Model #	VT1-N255-NMDX		
Serial #	U025112201		
Rated Flow GPM	635 GPM		
EWT / LWT	95F / 85F		
Motor HP	40		
Electrical	460V 3P		
Approx Age	12		
ASHRAE Service Life	20		
Remaining Life	8		
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Pumps

Tag	HWP-3, 4	CHWP-1, 2	CWP-5, 6
Unit Type	End Suction	End Suction	End Suction
Qty	2	2	2
Location	Basement Mech	Basement Mech	Basement Mech
Area Served	Building Hot Water	Building Chilled Water	Condenser Water
Manufacturer	Bell & Gossett	Bell & Gossett	Bell & Gossett
Model #	-	02B 9-1/2 BF	-
Serial #	-	691119	-
Horse Power	5.0	15.0	15
Flow	260 GPM, 51' HD	480 GPM, 80' HD	635 GPM, 58' HD
Motor Info	Fr 184T	Fr 254T	Fr D254T
Electrical Power	230/460V 3P	230/460V 3P	230/460V 3P
RPM	1750	1755	1750
Motor Efficiency %	85.0%	91.7%, 85%	81%, 85%
Approx Age			
ASHRAE Service Life			
Remaining Life			
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Exhaust Fans

Tag	RF-1	RF-2	EF-1
Unit Type	Return Fan	Return Fan	Toilet Exhaust
Qty	1	1	1
Location	Basement Mech	Penthouse	Roof
Area Served	AH-1	AH-2	Toilet Exhaust
Manufacturer	Trane	Trane	-
Model #	-	RF-17-A	-
Serial #	-	00055	-
Motor (HP)	3	2	3/4
Electrical (V/H/P)	230/460/60/3	230/460/60/3	115/1P
Approx Age			
ASHRAE Service Life	20	20	20
Remaining Life			
Comments	11,910 CFM, 0.25" SP	8,160 CFM, 0.25" SP	3010 CFM, 0.25" SP

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

Exhaust Fans

Tag	EF-2, 4	EF-3
Unit Type	Exhaust	Exhaust
Qty	2	1
Location	Penthouse	-
Area Served	Penthouse Exhaust	Print Shops Exhaust
Manufacturer	-	-
Model #	-	-
Serial #	-	-
Motor (HP)	1/2	-
Electrical (V/H/P)	115/1P	115/1P
Approx Age		
ASHRAE Service Life	20	20
Remaining Life		
Comments	5800 CFM, 0.125" SP	375 CFM, 0.125" SP

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Administration Building (101 Hooper)

Transformers

Tag	XFMR	XFMR	XFMR
Unit Type	Dry Type	Dry Type	Dry Type
Qty	1	1	1
Location	Basement Mech	Basement Mech	Basement Mech
Manufacturer	Federal Pacific	Square D	Federal Pacific
Catalog #	-	30T3H	-
Serial #	-	33347-17212-020	25094-037
Rating (kVA)	75.0	30.0	150.0
Electrical (V/H/P)	480/208Y/120/60/3	480/208Y/120/60/3	480/208Y/120/60/3
Impedance (%)	4.0%	6.0%	3.7%
Approx Age	20	10	20
ASHRAE Service Life	25	25	25
Remaining Life	5	15	5
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

APPENDIX E

CEG Project #: 1C14065.00
Facility Name: Ocean County Administration Building
Address: 101 Hooper Ave.
City, State, Zip Toms River, NJ, 08753

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
	3rd Floor																																	
4	304 Conf. RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	12	0.74	2,232	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	12	0.55	1,656	0.19	576	$77	4	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	1	20.0%	331	$44	$1,740.00	$600.00	$2,340.00	$600.00	22.71	$300.00	$50.00	$350.00	FALSE	7.95
3	3RD Flr. Elevator Lobby	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	4	0.37	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	990	0.15	684	$91	0	No New Controls	0	0.0%	0	$0	$840.00	$200.00	$1,040.00	$200.00	9.23	$0.00	$0.00	$0.00	$20.00	-
3	3rd Flr. Corridor	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	9	0.84	3,767	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	9	0.50	2,228	0.34	1,539	$205	0	No New Controls	0	0.0%	0	$0	$1,890.00	$450.00	$2,340.00	$450.00	9.23	$0.00	$0.00	$0.00	FALSE	-
4	341 Manag. & Bugdet - Reception	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	341 Manag. & Bugdet - Left-RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	3	0.19	558	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	414	0.05	144	$19	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	83	$11	$435.00	$150.00	$585.00	$150.00	22.71	$200.00	$50.00	$250.00	$35.00	19.52
4	340 Manag. & Budget - Right-RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$200.00	$50.00	$250.00	$35.00	6.51
4	339 Copy RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	338 LOCKED	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$13	0	No New Controls	0	0.0%	0	$0	$290.00	$100.00	$390.00	$100.00	22.71	$0.00	$0.00	$0.00	FALSE	-
3	337 Private-LOCKED	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	1	0.09	279	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	165	0.04	114	$15	0	No New Controls	0	0.0%	0	$0	$210.00	$50.00	$260.00	$50.00	13.85	$0.00	$0.00	$0.00	FALSE	-
4	335 Admin's Office - Recpetion	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	7	0.43	1,302	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	966	0.11	336	$45	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	193	$26	$1,015.00	$350.00	$1,365.00	$350.00	22.71	$200.00	$50.00	$250.00	$35.00	8.37
4	335 Admin's Office - Left RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	4	0.25	744	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	552	0.06	192	$26	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	110	$15	$580.00	$200.00	$780.00	$200.00	22.71	$200.00	$50.00	$250.00	$35.00	14.64
4	334 Admin's Office - Right RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	328 Clerk of the Board (COTB)	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	20	1.24	3,720	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	20	0.92	2,760	0.32	960	$128	5	Dual Technology Occupancy Sensor - Remote Mnt.	3	20.0%	552	$73	$2,900.00	$1,000.00	$3,900.00	$1,000.00	22.71	$600.00	$150.00	$750.00	$35.00	9.74
4	329 (COTB)	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
1	329 Kit/Closet (COTB)	3000	1x2 1 Lamp, 20w T12, Elect. Ballast, Surface Mnt., Prismatic	1	25	6	0.15	450	Replace Fixture	2' LED 2700 Lumen Surface Wrap 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	6	0.19	576	(0.04)	(126)	($17)	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	115	$15	$660.00	$300.00	$960.00	$0.00	(57.29)	$200.00	$50.00	$250.00	FALSE	16.32
4	330 (COTB)	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	5	0.31	930	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	690	0.08	240	$32	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	138	$18	$725.00	$250.00	$975.00	$250.00	22.71	$200.00	$50.00	$250.00	$35.00	11.71
5	(COTB) Vault	3000	2x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	8	0.50	1,488	Replace Fixture	2x4 LED Recessed w/ Air Vent 4000 Lumen 38w Cooper #24A/C-LD3-39-UNV-L840-CD1-U	1	38	8	0.30	912	0.19	576	$77	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	182	$24	$1,400.00	$400.00	$1,800.00	$400.00	18.27	$200.00	$50.00	$250.00	$35.00	8.86
2	Men's Restroom by RM 330	4500	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	558	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	432	0.03	126	$17	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$11	$260.00	$100.00	$360.00	$100.00	15.51	$50.00	$50.00	$100.00	FALSE	8.70
2	Women's Restroom by RM 330	4500	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	558	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	432	0.03	126	$17	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$11	$260.00	$100.00	$360.00	$100.00	15.51	$50.00	$50.00	$100.00	FALSE	8.70
4	Corridor by RM's 316-305	4500	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	11	0.68	3,069	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	11	0.51	2,277	0.18	792	$105	0	No New Controls	0	0.0%	0	$0	$1,595.00	$550.00	$2,145.00	$550.00	15.14	$0.00	$0.00	$0.00	FALSE	-
4	316 Freeholder Dir. RM - Reception	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
6	317 Freeholder Dir. Main Office	3000	2x2 2 Lamp, 17w F17, Elect. Ballast, Recessed, Direct/Indirect	2	33	9	0.30	891	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	(0.12)	(351)	($47)	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	(27.95)	$200.00	$50.00	$250.00	$35.00	6.51
1	317 Freeholder Dir. Main Office Kit/Closet	3000	1x2 1 Lamp, 20w T12, Elect. Ballast, Surface Mnt., Prismatic	1	25	1	0.03	75	Replace Fixture	2' LED 2700 Lumen Surface Wrap 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	96	(0.01)	(21)	($3)	0	No New Controls	0	0.0%	0	$0	$110.00	$50.00	$160.00	$0.00	(57.29)	$0.00	$0.00	$0.00	FALSE	-
4	314 Freeholder RM - Reception	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$51	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	221	$29	$1,160.00	$400.00	$1,560.00	$400.00	22.71	$200.00	$50.00	$250.00	$35.00	7.32
4	315 Freeholder RM - Main Office	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$51	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	221	$29	$1,160.00	$400.00	$1,560.00	$400.00	22.71	$200.00	$50.00	$250.00	$35.00	7.32
1	315 Freeholder RM - Main Office Kit/Closet	3000	1x2 1 Lamp, 20w T12, Elect. Ballast, Surface Mnt., Prismatic	1	25	1	0.03	75	Replace Fixture	2' LED 2700 Lumen Surface Wrap 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	96	(0.01)	(21)	($3)	0	No New Controls	0	0.0%	0	$0	$110.00	$50.00	$160.00	$0.00	(57.29)	$0.00	$0.00	$0.00	FALSE	-
4	312 Freeholder RM - Reception	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	313 Freeholder RM - Main Office	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	10	0.62	1,860	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	1,380	0.16	480	$64	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	276	$37	$1,450.00	$500.00	$1,950.00	$500.00	22.71	$200.00	$50.00	$250.00	$35.00	5.86
1	313 Freeholder RM - Main Office Kit/Closet	3000	1x2 1 Lamp, 20w T12, Elect. Ballast, Surface Mnt., Prismatic	1	25	1	0.03	75	Replace Fixture	2' LED 2700 Lumen Surface Wrap 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	96	(0.01)	(21)	($3)	0	No New Controls	0	0.0%	0	$0	$110.00	$50.00	$160.00	$0.00	(57.29)	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
4	311 Freeholder RM - Reception	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	310 Freeholder RM - Main Office	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	7	0.43	1,302	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	7	0.32	966	0.11	336	$45	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	193	$26	$1,015.00	$350.00	$1,365.00	$350.00	22.71	$200.00	$50.00	$250.00	$35.00	8.37
12	310 Freeholder RM - Main Office	3000	6" 100w PAR Recessed Down Light	1	100	5	0.50	1,500	Re-lamp	13w PAR38 LED Lamp Medium Base	1	13	5	0.07	195	0.44	1,305	$174	0	No New Controls	0	0.0%	0	$0	$237.50	$81.25	$318.75	$0.00	1.84	$0.00	$0.00	$0.00	FALSE	-
1	310 Freeholder RM - Main Office Kit/Closet	3000	1x2 1 Lamp, 20w T12, Elect. Ballast, Surface Mnt., Prismatic	1	25	1	0.03	75	Replace Fixture	2' LED 2700 Lumen Surface Wrap 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	96	(0.01)	(21)	($3)	0	No New Controls	0	0.0%	0	$0	$110.00	$50.00	$160.00	$0.00	(57.29)	$0.00	$0.00	$0.00	FALSE	-
4	308 Freeholder RM - Reception	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	5	0.31	930	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	690	0.08	240	$32	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	138	$18	$725.00	$250.00	$975.00	$250.00	22.71	$200.00	$50.00	$250.00	$35.00	11.71
4	309 Freeholder RM - Main Office	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
1	309 Freeholder RM - Main Office Kit/Closet	3000	1x2 1 Lamp, 20w T12, Elect. Ballast, Surface Mnt., Prismatic	1	25	1	0.03	75	Replace Fixture	2' LED 2700 Lumen Surface Wrap 32w Cooper #2WNLED-LD1-27-F-UNV-L840-CD1-U	1	32	1	0.03	96	(0.01)	(21)	($3)	0	No New Controls	0	0.0%	0	$0	$110.00	$50.00	$160.00	$0.00	(57.29)	$0.00	$0.00	$0.00	FALSE	-
4	305 Receptionist RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	10	0.62	1,860	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	10	0.46	1,380	0.16	480	$64	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	276	$37	$1,450.00	$500.00	$1,950.00	$500.00	22.71	$200.00	$50.00	$250.00	$35.00	5.86
4	Elevator Hallway	4500	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	3	0.19	837	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	621	0.05	216	$29	0	No New Controls	0	0.0%	0	$0	$435.00	$150.00	$585.00	$150.00	15.14	$0.00	$0.00	$0.00	FALSE	-
8	Utility Closet Next to Elev. - LOCKED	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	1	0.06	124	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	96	0.01	28	$4	0	No New Controls	0	0.0%	0	$0	$130.00	$50.00	$180.00	$50.00	34.91	$0.00	$0.00	$0.00	FALSE	-
13	Elevator	8760	4" 45w BR20 Recessed Down Light	1	45	6	0.27	2,365	Re-lamp	8w R20 LED Lamp Medium Base	1	8	6	0.05	420	0.22	1,945	$259	0	No New Controls	0	0.0%	0	$0	$192.00	$97.50	$289.50	$0.00	1.12	$0.00	$0.00	$0.00	FALSE	-
18	Not An Exit RM - LOCKED	2000	Unkown	1	0	0	0.00	0	Existing to Remain	0	1	0	0	0.00	0	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
7	Men's Restroom by RM 319	4500	1x3 2 Lamp, 30w T12, Elect. Ballast, Surface Mnt., Prismatic	2	79	1	0.08	356	Replace Fixture	2' LED 2300 Lumen Surface Wrap 23w Cooper #2SNLED-LD1-23-LC-UNV-840-CD1-U	1	23	1	0.02	104	0.06	252	$34	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	21	$3	$120.00	$50.00	$170.00	$0.00	5.07	$50.00	$50.00	$100.00	FALSE	36.32
7	Women's Restroom by RM 319	4500	1x3 2 Lamp, 30w T12, Elect. Ballast, Surface Mnt., Prismatic	2	79	1	0.08	356	Replace Fixture	2' LED 2300 Lumen Surface Wrap 23w Cooper #2SNLED-LD1-23-LC-UNV-840-CD1-U	1	23	1	0.02	104	0.06	252	$34	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	21	$3	$120.00	$50.00	$170.00	$0.00	5.07	$50.00	$50.00	$100.00	FALSE	36.32
4	319 Break RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	318 Copy RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	4	0.25	744	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	552	0.06	192	$26	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	110	$15	$580.00	$200.00	$780.00	$200.00	22.71	$200.00	$50.00	$250.00	$35.00	14.64
11	South Staircase	8760	2x4 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	4	114	5	0.57	4,993	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24A/CS-LD3-55-UNV-L840-CD1-U	1	55	5	0.28	2,409	0.30	2,584	$344	0	No New Controls	0	0.0%	0	$0	$875.00	$250.00	$1,125.00	$250.00	2.55	$0.00	$0.00	$0.00	FALSE	-
5	South Staircase	8760	2x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	3	0.19	1,629	Replace Fixture	2x4 LED Recessed w/ Air Vent 4000 Lumen 38w Cooper #24A/C-LD3-39-UNV-L840-CD1-U	1	38	3	0.11	999	0.07	631	$84	0	No New Controls	0	0.0%	0	$0	$525.00	$150.00	$675.00	$150.00	6.26	$0.00	$0.00	$0.00	FALSE	-
	2nd Floor																																	
3	2ND Flr. Elevator Lobby	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	2	0.19	837	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	495	0.08	342	$45	0	No New Controls	0	0.0%	0	$0	$420.00	$100.00	$520.00	$100.00	9.23	$0.00	$0.00	$0.00	FALSE	-
3	2ND Flr. Corridor	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	9	0.84	3,767	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	9	0.50	2,228	0.34	1,539	$205	0	No New Controls	0	0.0%	0	$0	$1,890.00	$450.00	$2,340.00	$450.00	9.23	$0.00	$0.00	$0.00	FALSE	-
3	203 Employee Relations	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	18	1.67	5,022	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	18	0.99	2,970	0.68	2,052	$273	5	Dual Technology Occupancy Sensor - Remote Mnt.	3	20.0%	594	$79	$3,780.00	$900.00	$4,680.00	$900.00	13.85	$600.00	$150.00	$750.00	$35.00	9.05
3	203 Employee Relations - Left RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	4	0.37	1,116	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.15	456	$61	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$18	$840.00	$200.00	$1,040.00	$200.00	13.85	$50.00	$50.00	$100.00	$20.00	4.56
3	203 Employee Relations - Right RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	3	0.28	837	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	495	0.11	342	$45	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	99	$13	$630.00	$150.00	$780.00	$150.00	13.85	$50.00	$50.00	$100.00	$20.00	6.08
4	203-13 Conf. RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
3	225 Risk Management RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	9	0.84	2,511	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	9	0.50	1,485	0.34	1,026	$136	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	297	$40	$1,890.00	$450.00	$2,340.00	$450.00	13.85	$50.00	$50.00	$100.00	$20.00	2.03
4	225 Risk Management - Left RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
3	225 Risk Management - Right RM (Back)	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$30	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$9	$420.00	$100.00	$520.00	$100.00	13.85	$50.00	$50.00	$100.00	$20.00	9.11
3	225 Risk Management - Right RM (Front) Closer to Hallway	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$30	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$9	$420.00	$100.00	$520.00	$100.00	13.85	$50.00	$50.00	$100.00	$20.00	9.11
4	224 Copy RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	224 Purchasing RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	23	1.43	4,278	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	23	1.06	3,174	0.37	1,104	$147	5	Dual Technology Occupancy Sensor - Remote Mnt.	4	20.0%	635	$84	$3,335.00	$1,150.00	$4,485.00	$1,150.00	22.71	$800.00	$200.00	$1,000.00	$35.00	11.43
4	224 Back RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76

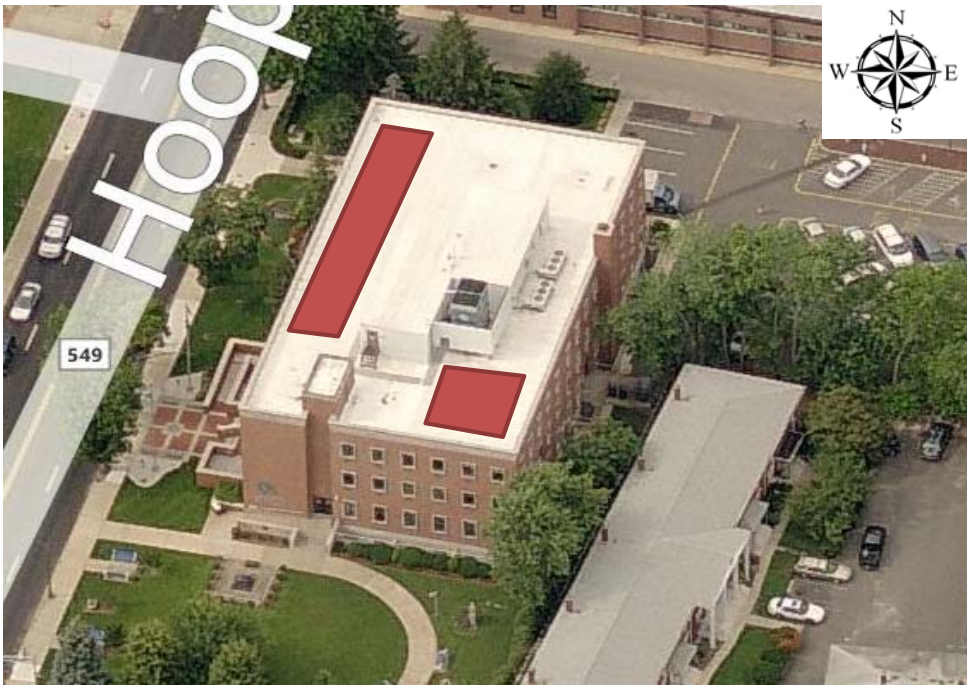
			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
4	224 Office next to Back RM	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	224 Back Office next Copy RM	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	2	0.12	372	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	276	0.03	96	$13	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	55	$7	$290.00	$100.00	$390.00	$100.00	22.71	$200.00	$50.00	$250.00	FALSE	34.05
3	224 Back Office next Copy RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	8	0.74	2,232	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	8	0.44	1,320	0.30	912	$121	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	264	$35	$1,680.00	$400.00	$2,080.00	$400.00	13.85	$200.00	$50.00	$250.00	$35.00	6.12
3	224 Back Office next Copy RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	10	0.93	2,790	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	10	0.55	1,650	0.38	1,140	$152	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	330	$44	$2,100.00	$500.00	$2,600.00	$500.00	13.85	$200.00	$50.00	$250.00	$35.00	4.90
5	224 Back Office Vault	3000	2x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	8	0.50	1,488	Replace Fixture	2x4 LED Recessed w/ Air Vent 4000 Lumen 38w Cooper #24A/C-LD3-39-UNV-L840-CD1-U	1	38	8	0.30	912	0.19	576	$77	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	182	$24	$1,400.00	$400.00	$1,800.00	$400.00	18.27	$200.00	$50.00	$250.00	$35.00	8.86
3	224 Payroll Offices Vault	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	6	0.56	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.23	684	$91	4	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	1	20.0%	198	$26	$1,260.00	$300.00	$1,560.00	$300.00	13.85	$300.00	$50.00	$350.00	FALSE	13.29
3	224 Finance Office	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	24	2.23	6,696	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	24	1.32	3,960	0.91	2,736	$364	4	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	2	20.0%	792	$105	$5,040.00	$1,200.00	$6,240.00	$1,200.00	13.85	$600.00	$100.00	$700.00	FALSE	6.65
14	224 Finance Offices	3000	6" 13w 2 DTT Pin Based Recessed Wall Wash	2	26	5	0.13	390	Existing to Remain	0	2	26	0	0.13	390	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	78	$10	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	9.64
3	224 Payroll Offices	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$30	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$9	$420.00	$100.00	$520.00	$100.00	13.85	$50.00	$50.00	$100.00	$20.00	9.11
3	224 Payroll Offices	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	2	0.19	558	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	330	0.08	228	$30	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	66	$9	$420.00	$100.00	$520.00	$100.00	13.85	$50.00	$50.00	$100.00	$20.00	9.11
3	224 Payroll Offices	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	3	0.28	837	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	495	0.11	342	$45	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	99	$13	$630.00	$150.00	$780.00	$150.00	13.85	$50.00	$50.00	$100.00	$20.00	6.08
3	224 Payroll Offices	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	5	0.47	1,395	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	5	0.28	825	0.19	570	$76	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	165	$22	$1,050.00	$250.00	$1,300.00	$250.00	13.85	$50.00	$50.00	$100.00	$20.00	3.65
3	Payroll Hallway	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	2	0.19	837	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	495	0.08	342	$45	0	No New Controls	0	0.0%	0	$0	$420.00	$100.00	$520.00	$100.00	9.23	$0.00	$0.00	$0.00	FALSE	-
8	218 LOCKED	3000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	1	0.06	186	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	144	0.01	42	$6	0	No New Controls	0	0.0%	0	$0	$130.00	$50.00	$180.00	$50.00	23.27	$0.00	$0.00	$0.00	FALSE	-
3	218 Employee Relations	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	11	1.02	3,069	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	11	0.61	1,815	0.42	1,254	$167	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	363	$48	$2,310.00	$550.00	$2,860.00	$550.00	13.85	$200.00	$50.00	$250.00	$35.00	4.45
3	218 Office	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	4	0.37	1,116	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	660	0.15	456	$61	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$18	$840.00	$200.00	$1,040.00	$200.00	13.85	$50.00	$50.00	$100.00	$20.00	4.56
3	218 Office	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	6	0.56	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	990	0.23	684	$91	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	198	$26	$1,260.00	$300.00	$1,560.00	$300.00	13.85	$50.00	$50.00	$100.00	$20.00	3.04
	1st Floor																																	
3	1st Flr. Main Entrance	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	21	1.95	8,789	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	21	1.16	5,198	0.80	3,591	$478	0	No New Controls	0	0.0%	0	$0	$4,410.00	$1,050.00	$5,460.00	$1,050.00	9.23	$0.00	$0.00	$0.00	FALSE	-
3	1st Flr. Main Entrance Hallway	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	6	0.56	2,511	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,485	0.23	1,026	$136	0	No New Controls	0	0.0%	0	$0	$1,260.00	$300.00	$1,560.00	$300.00	9.23	$0.00	$0.00	$0.00	FALSE	-
3	115 Telephone Switch Board RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	3	0.28	837	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	495	0.11	342	$45	0	No New Controls	0	0.0%	0	$0	$630.00	$150.00	$780.00	$150.00	13.85	$0.00	$0.00	$0.00	FALSE	-
4	119 Foreholder RM	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	42	2.60	7,812	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	42	1.93	5,796	0.67	2,016	$268	0	No New Controls	0	0.0%	0	$0	$6,090.00	$2,100.00	$8,190.00	$2,100.00	22.71	$0.00	$0.00	$0.00	FALSE	-
4	117 Conference RM	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$200.00	$50.00	$250.00	$35.00	6.51
4	109 Bus & Tour RM - Reception	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$200.00	$50.00	$250.00	$35.00	6.51
4	108 Bus & Tour - End Office	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$200.00	$50.00	$250.00	$35.00	6.51
4	109 Bus & Tour RM - Little Office	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
4	109 Bus & Tour RM - Big Office	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$200.00	$50.00	$250.00	$35.00	6.51
4	109 Bus & Tour RM - Little Hallway	4500	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	3	0.19	837	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	621	0.05	216	$29	0	No New Controls	0	0.0%	0	$0	$435.00	$150.00	$585.00	$150.00	15.14	$0.00	$0.00	$0.00	FALSE	-
4	107 Public RM - Reception	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	0	No New Controls	0	0.0%	0	$0	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$0.00	$0.00	$0.00	FALSE	-
4	107 Public RM - Main Office	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
4	131 Reception Hallway	4500	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	13	0.81	3,627	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	13	0.60	2,691	0.21	936	$124	0	No New Controls	0	0.0%	0	$0	$1,885.00	$650.00	$2,535.00	$650.00	15.14	$0.00	$0.00	$0.00	FALSE	-
4	131 Office 1	3000	2x2 2 Lamp, 32w T8 Ntube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
4	131 Office 2	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
4	131 Office 3	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
4	131 Office Corner	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$51	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	221	$29	$1,160.00	$400.00	$1,560.00	$400.00	22.71	$50.00	$50.00	$100.00	$20.00	2.72
4	131 Conference RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$50.00	$50.00	$100.00	$20.00	3.63
4	131 Big Office 5	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	18	1.12	3,348	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	18	0.83	2,484	0.29	864	$115	4	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	2	20.0%	497	$66	$2,610.00	$900.00	$3,510.00	$900.00	22.71	$600.00	$100.00	$700.00	FALSE	10.59
4	130 Office 6 - Connected to Big Office 5	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	24	1.49	4,464	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	24	1.10	3,312	0.38	1,152	$153	4	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	2	20.0%	662	$88	$3,480.00	$1,200.00	$4,680.00	$1,200.00	22.71	$600.00	$100.00	$700.00	FALSE	7.95
2	Men's Restroom	4500	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	558	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	432	0.03	126	$17	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	86	$11	$260.00	$100.00	$360.00	$100.00	15.51	$200.00	$50.00	$250.00	FALSE	21.76
2	Women's Restroom	4500	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	558	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	432	0.03	126	$17	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	86	$11	$260.00	$100.00	$360.00	$100.00	15.51	$200.00	$50.00	$250.00	FALSE	21.76
4	Room next to Women's Restroom	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	1	0.06	186	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	138	0.02	48	$6	0	No New Controls	0	0.0%	0	$0	$145.00	$50.00	$195.00	$50.00	22.71	$0.00	$0.00	$0.00	FALSE	-
8	Utility Closet - LOCKED	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	2	0.12	248	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	192	0.03	56	$7	0	No New Controls	0	0.0%	0	$0	$260.00	$100.00	$360.00	$100.00	34.91	$0.00	$0.00	$0.00	FALSE	-
4	Freeholders Conference Room 2 - LOCKED	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	8	0.50	1,488	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	8	0.37	1,104	0.13	384	$51	0	No New Controls	0	0.0%	0	$0	$1,160.00	$400.00	$1,560.00	$400.00	22.71	$0.00	$0.00	$0.00	FALSE	-
	Basement Floor																																	
4	Training RM	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	16	0.99	2,976	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	16	0.74	2,208	0.26	768	$102	4	Dual Tech. Occupancy Sensor w/2 Pole Powerpack - Remote Mnt.	2	20.0%	442	$59	$2,320.00	$800.00	$3,120.00	$800.00	22.71	$600.00	$100.00	$700.00	FALSE	11.92
3	9 Lunch RM	3000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	8	0.74	2,232	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	8	0.44	1,320	0.30	912	$121	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	264	$35	$1,680.00	$400.00	$2,080.00	$400.00	13.85	$400.00	$100.00	$500.00	$35.00	13.24
2	Men's Restroom	4500	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	558	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	432	0.03	126	$17	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	86	$11	$260.00	$100.00	$360.00	$100.00	15.51	$200.00	$50.00	$250.00	FALSE	21.76
4	8 Room	2600	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	3	0.19	484	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	3	0.14	359	0.05	125	$17	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	72	$10	$435.00	$150.00	$585.00	$150.00	26.21	$50.00	$50.00	$100.00	$20.00	8.38
4	7 Room	2600	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	15	0.93	2,418	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	15	0.69	1,794	0.24	624	$83	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	359	$48	$2,175.00	$750.00	$2,925.00	$750.00	26.21	$200.00	$50.00	$250.00	$35.00	4.51
4	RM 5/6 Hallway	4500	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	1	0.06	279	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	1	0.05	207	0.02	72	$10	0	No New Controls	0	0.0%	0	$0	$145.00	$50.00	$195.00	$50.00	15.14	$0.00	$0.00	$0.00	FALSE	-
8	5 Room - LOCKED	2600	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	4	0.25	645	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.06	146	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	100	$13	$520.00	$200.00	$720.00	$200.00	26.85	$50.00	$50.00	$100.00	$20.00	6.02
8	6 Room - LOCKED	2600	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	4	0.25	645	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	499	0.06	146	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	100	$13	$520.00	$200.00	$720.00	$200.00	26.85	$50.00	$50.00	$100.00	$20.00	6.02
4	25 IT Server Room	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	13	0.81	2,418	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	13	0.60	1,794	0.21	624	$83	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	359	$48	$1,885.00	$650.00	$2,535.00	$650.00	22.71	$200.00	$50.00	$250.00	$35.00	4.51
15	25 IT Server Room	3000	2x4 4 Lamp, 32w T8, Elect. Ballast, Recessed, Prismatic	4	114	12	1.37	4,104	Replace Fixture	2x4 LED Recessed 6900 Lumen 72w Cooper #24A/C-LD3-68-UNV-L840-CD1-U	1	72	12	0.86	2,592	0.50	1,512	$201	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	518	$69	$2,520.00	$600.00	$3,120.00	$600.00	12.53	$200.00	$50.00	$250.00	$35.00	3.12
8	25 IT Server Room	3000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	8	0.50	1,488	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	8	0.38	1,152	0.11	336	$45	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	230	$31	$1,040.00	$400.00	$1,440.00	$400.00	23.27	$200.00	$50.00	$250.00	$35.00	7.02
3	Basement Hallway	4500	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	12	1.12	5,022	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	12	0.66	2,970	0.46	2,052	$273	0	No New Controls	0	0.0%	0	$0	$2,520.00	$600.00	$3,120.00	$600.00	9.23	$0.00	$0.00	$0.00	FALSE	-
4	Basement Hallway	800	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	2	0.12	99	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	74	0.03	26	$3	0	No New Controls	0	0.0%	0	$0	$290.00	$100.00	$390.00	$100.00	85.17	$0.00	$0.00	$0.00	FALSE	-
3	B&G Storage	2000	2x4 3 Lamp, 32w T8, Elect. Ballast, Recessed, Parabolic	3	93	9	0.84	1,674	Replace Fixture	2x4 LED Recessed w/ Air Vent 5800 Lumen 55w Cooper #24A/C-LD3-55-UNV-L840-CD1-U	1	55	9	0.50	990	0.34	684	$91	0	No New Controls	0	0.0%	0	$0	$1,890.00	$450.00	$2,340.00	$450.00	20.78	$0.00	$0.00	$0.00	FALSE	-
4	B&G Storage - Back Hallway	4500	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	5	0.31	1,395	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22A/C-LD3-38-UNV-L840-CD1-U	1	46	5	0.23	1,035	0.08	360	$48	0	No New Controls	0	0.0%	0	$0	$725.00	$250.00	$975.00	$250.00	15.14	$0.00	$0.00	$0.00	FALSE	-
2	B&G Storage - Back Hallway	4500	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	1	0.06	279	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	216	0.01	63	$8	0	No New Controls	0	0.0%	0	$0	$130.00	$50.00	$180.00	$50.00	15.51	$0.00	$0.00	$0.00	FALSE	-
2	Pump Room	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	1	0.06	124	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	1	0.05	96	0.01	28	$4	0	No New Controls	0	0.0%	0	$0	$130.00	$50.00	$180.00	$50.00	34.91	$0.00	$0.00	$0.00	FALSE	-
8	16 Mechanical RM	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	8	0.50	992	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	8	0.38	768	0.11	224	$30	0	No New Controls	0	0.0%	0	$0	$1,040.00	$400.00	$1,440.00	$400.00	34.91	$0.00	$0.00	$0.00	FALSE	-
9	16 Mechanical RM	2000	1x4 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	3	93	4	0.37	744	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	384	0.18	360	$48	0	No New Controls	0	0.0%	0	$0	$520.00	$200.00	$720.00	$200.00	10.86	$0.00	$0.00	$0.00	FALSE	-
8	Back Mechanical RM	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	9	0.56	1,116	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	9	0.43	864	0.13	252	$34	0	No New Controls	0	0.0%	0	$0	$1,170.00	$450.00	$1,620.00	$450.00	34.91	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
9	Back Mechanical RM	2000	1x4 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	3	93	2	0.19	372	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	192	0.09	180	$24	0	No New Controls	0	0.0%	0	$0	$260.00	$100.00	$360.00	$100.00	10.86	$0.00	$0.00	$0.00	FALSE	-
10	Back Mechanical RM - Back Hallway	4500	1x4 2 Lamp, 32w T8, Magnet, Ballast, Surface Mnt., Prismatic	2	70	2	0.14	630	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	432	0.04	198	$26	0	No New Controls	0	0.0%	0	$0	$260.00	$100.00	$360.00	$100.00	9.87	$0.00	$0.00	$0.00	FALSE	-
5	Utility Stairs	8760	2x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	1,086	Replace Fixture	2x4 LED Recessed w/ Air Vent 4000 Lumen 38w Cooper #24AC-LD3-39-UNV-L840-CD1-U	1	38	2	0.08	666	0.05	420	$56	0	No New Controls	0	0.0%	0	$0	$350.00	$100.00	$450.00	$100.00	6.26	$0.00	$0.00	$0.00	FALSE	-
4	Room 11/12 - Hallway	4500	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	2	0.12	558	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	414	0.03	144	$19	0	No New Controls	0	0.0%	0	$0	$290.00	$100.00	$390.00	$100.00	15.14	$0.00	$0.00	$0.00	FALSE	-
5	Room 11/12 - Storage RM	2000	2x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	6	0.37	744	Replace Fixture	2x4 LED Recessed w/ Air Vent 4000 Lumen 38w Cooper #24AC-LD3-39-UNV-L840-CD1-U	1	38	6	0.23	456	0.14	288	$38	0	No New Controls	0	0.0%	0	$0	$1,050.00	$300.00	$1,350.00	$300.00	27.41	$0.00	$0.00	$0.00	FALSE	-
4	Room 11/12 - Front Storage RM	2000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	828	0.14	288	$38	0	No New Controls	0	0.0%	0	$0	$1,305.00	$450.00	$1,755.00	$450.00	34.07	$0.00	$0.00	$0.00	FALSE	-
4	Room 11/12 - Main Office (Between Strouge & Front Storage RM)	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
4	Office #6	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	9	0.56	1,674	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	9	0.41	1,242	0.14	432	$57	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	248	$33	$1,305.00	$450.00	$1,755.00	$450.00	22.71	$200.00	$50.00	$250.00	$35.00	6.51
4	Office #8	3000	2x2 2 Lamp, 32w T8 Utube, Elect. Ballast, Recessed, Parabolic	2	62	6	0.37	1,116	Replace Fixture	2x2 LED Recessed w/ Air Vent 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	6	0.28	828	0.10	288	$38	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	166	$22	$870.00	$300.00	$1,170.00	$300.00	22.71	$200.00	$50.00	$250.00	$35.00	9.76
11	North Staircase	8760	2x4 4 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	4	114	5	0.57	4,993	Replace Fixture	2x4 LED Surface 5800 Lumen 55w Cooper #24ACS-LD3-55-UNV-L840-CD1-U	1	55	5	0.28	2,409	0.30	2,584	$344	0	No New Controls	0	0.0%	0	$0	$875.00	$250.00	$1,125.00	$250.00	2.55	$0.00	$0.00	$0.00	FALSE	-
5	North Staircase	8760	2x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic	2	62	2	0.12	1,086	Replace Fixture	2x4 LED Recessed w/ Air Vent 4000 Lumen 38w Cooper #24AC-LD3-39-UNV-L840-CD1-U	1	38	2	0.08	666	0.05	420	$56	0	No New Controls	0	0.0%	0	$0	$350.00	$100.00	$450.00	$100.00	6.26	$0.00	$0.00	$0.00	FALSE	-
	Roof Penthouse																																	
8	Penthouse Elevator Room	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	4	0.25	496	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	384	0.06	112	$15	0	No New Controls	0	0.0%	0	$0	$520.00	$200.00	$720.00	$200.00	34.91	$0.00	$0.00	$0.00	FALSE	-
9		2000	1x4 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	3	93	2	0.19	372	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	2	0.10	192	0.09	180	$24	0	No New Controls	0	0.0%	0	$0	$260.00	$100.00	$360.00	$100.00	10.86	$0.00	$0.00	$0.00	FALSE	-
8	Penthouse Mechanical	2000	1x4 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	2	62	12	0.74	1,488	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	12	0.58	1,152	0.17	336	$45	0	No New Controls	0	0.0%	0	$0	$1,560.00	$600.00	$2,160.00	$600.00	34.91	$0.00	$0.00	$0.00	FALSE	-
9		2000	1x4 3 Lamp, 32w T8, Elect. Ballast, Surface Mnt., None	3	93	4	0.37	744	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	4	0.19	384	0.18	360	$48	0	No New Controls	0	0.0%	0	$0	$520.00	$200.00	$720.00	$200.00	10.86	$0.00	$0.00	$0.00	FALSE	-
	Exterior																																	
16	North Side Entrance	4000	1-Lamp 13w CFL Wall Mount	1	13	1	0.01	52	Existing to Remain	0	1	13	0	0.01	52	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
16	South Side Entrance	4000	1-Lamp 13w CFL Wall Mount	1	13	1	0.01	52	Existing to Remain	0	1	13	0	0.01	52	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
16	Back Area	4000	1-Lamp 13w CFL Wall Mount	1	13	1	0.01	52	Existing to Remain	0	1	13	0	0.01	52	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
17	Back Area	4000	70w HID Wall Pack	1	92	1	0.09	368	Replace Fixture	LED Exterior Wall Pack 26w	1	26	1	0.03	104	0.07	264	$35	0	No New Controls	0	0.0%	0	$0	$375.00	$100.00	$475.00	$100.00	10.68	$0.00	$0.00	$0.00	FALSE	-
17	Back Area	4000	70w HID Wall Pack	1	92	1	0.09	368	Replace Fixture	LED Exterior Wall Pack 26w	1	26	1	0.03	104	0.07	264	$35	0	No New Controls	0	0.0%	0	$0	$375.00	$100.00	$475.00	$100.00	10.68	$0.00	$0.00	$0.00	FALSE	-
16	Back Area	4000	1-Lamp 13w CFL Wall Mount	1	13	1	0.01	52	Existing to Remain	0	1	13	0	0.01	52	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					**901**	**63**	**207,495**					**892**	**43**	**138,156**	**20**	**69,339**	**$9,222**			**96**	**17**	**17,697**	**$2,354**	**$142,290**	**$44,329**	**$186,618**	**$43,500**	**15.518984**	**$16,000**	**$4,800**	**$20,800**	**$2,055.00**	**$7.96**

APPENDIX F

Location Description	Area (Sq FT)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Total KW_{AC}	Panel Weight (41.9 lbs)	W/SQFT
Administration	8000	SHARP ND-240QCJ	57	17.5	1,000	13.68	16,686	11.1	2,388	13.68



= Proposed PV Roof Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.

Project Name: **LGEA Solar PV Project - Administration**
Location: **Toms River, NJ**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$66,222
Annual kWh Production	16,686
Annual Energy Cost Reduction	$2,219
Average Annual SREC Revenue	$2,528

Simple Payback: **13.95** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.133**
Financing Rate: 6.00%
Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/kWh) $0.152

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$0	0	0	0	$0	0	0	0	0
1	$0	16,686	$2,219	$0	$4,172	$3,897	$2,809	($315)	($315)
2	$0	16,603	$2,286	$0	$4,151	$3,724	$2,982	($269)	($585)
3	$0	16,520	$2,354	$0	$4,130	$3,540	$3,166	($222)	($806)
4	$0	16,437	$2,425	$0	$3,287	$3,344	$3,361	($993)	($1,800)
5	$0	16,355	$2,498	$168	$3,271	$3,137	$3,569	($1,106)	($2,905)
6	$0	16,273	$2,573	$168	$3,255	$2,917	$3,789	($1,046)	($3,951)
7	$0	16,192	$2,650	$167	$2,429	$2,683	$4,023	($1,794)	($5,745)
8	$0	16,111	$2,729	$166	$2,417	$2,435	$4,271	($1,726)	($7,471)
9	$0	16,030	$2,811	$165	$2,405	$2,172	$4,534	($1,655)	($9,126)
10	$0	15,950	$2,896	$164	$1,595	$1,892	$4,814	($2,380)	($11,506)
11	$0	15,870	$2,982	$163	$1,587	$1,595	$5,111	($2,300)	($13,806)
12	$0	15,791	$3,072	$163	$1,579	$1,280	$5,426	($2,217)	($16,023)
13	$0	15,712	$3,164	$162	$786	$945	$5,760	($2,918)	($18,941)
14	$0	15,633	$3,259	$161	$782	$590	$6,116	($2,826)	($21,767)
15	$0	15,555	$3,357	$160	$778	$213	$6,493	($2,732)	($24,499)
	Totals:	241,717	$41,275	$1,807	$36,621	$34,366	$66,222	($24,499)	($139,248)

Net Present Value (NPV) **($17,104)**

APPENDIX G

POWERSMITHS

The ESP Calculator™

Energy Savings Payback Calculator

Toll Free : 1-800-747-9627 or (905) 791-1493

Project Description Administration Building (101 Hooper)

Date 30-Apr-14

Data Entry

Transformers on Project

QTY	kVA
	15
1	30
	45
1	75
	112.5
1	150
	225
	300
	500
	750
	1000
	1500
	2000
	7.5

		Calc Load kW	Calc Annual kWh
Available Full Load kW	**255**		
Average kVA (calc)	**85**		
equipment operating hrs/ day	**14**		
equipment operating days/yr	**260**		
Load during normal operating hours	**60%**	153	556,920
Load outside operating hours	**10%**	26	130,560
		Total Annual Load kWh:	**687,480**

Annual Cost to Operate Load Only

kWh rate	$ 0.133	Annual Consumption:	$	91,435
demand rate ($/kW/mo) ex. $10.00	$0.00	Annual Demand:	$	-
		Total Cost to run load	**$**	**91,435**

Annual Cost of Status Quo Transformer Losses & Associated Air Conditioning (A/C) burden

Nameplate Linear efficiency (normal op hrs)	96.0%	% electronics or current THD	10.0%
Calculated operating efficiency	95.6%		
Transformer kW Losses (Normal Operation)	7.0 kW		
Status quo Efficiency (Outside op. hrs)	94.0%		
Transformer kW Losses (Outside op. hrs)	1.6 kW		
Annual addititional kWh from transformers	33,966 kWh		
Annual Cost of Transformer Losses	$ 4,517		
A/C System Performance (kW/ton)	-		
Additional Tons of Cooling (on peak)	- tons		
Annual addititional kWh from A/C	- kWh		
Annual Cost of Associated A/C	$ -		

Summary with Status Quo Transformer

Annual Cost of feeding Building Load	$	91,435
Annual Cost of Transformer Losses	$	4,517
Annual Cost of Associated A/C	$	-
Electrical Bill (Status Quo Transformer)	**$**	**95,952**

Using Powersmiths instead of status quo transformers

Powersmiths Efficiency (Normal Operation)	98.6%	
Powersmiths kW Losses (Normal Operation)	2.2	kW
Powersmiths Efficiency (Outside op. hrs)	97.6%	
Transformer kW Losses (Outside op. hrs)	0.6	kW
Annual addititional kWh from transformers	11,118	kWh
Annual Cost of Powersmiths Losses	$ 1,479	
Additional Tons of Cooling (on peak)	-	tons
Annual addititional kWh from A/C	-	kWh
Annual Cost of Associated A/C	$ -	

Comparing Status Quo & Powersmiths

	Status Quo	Powersmiths	
Annual Cost of feeding Building Load	$ 91,435	$ 91,435	
Annual Cost of Transformer Losses	$ 4,517	$ 1,479	
Annual Cost of Associated A/C	$ -	$ -	**Reduction**
Annual estimated Electrical Bill	$ 95,952	$ 92,914	**3%**

Peak kW reduction (normal op hours)	**4.9**	**kW**
Annual kWh reduction	**22,848**	**kWh**
Reduction in Air Conditioning Load (on peak)	**-**	**tons**

Cost Analysis (calc)

Energy Cost Escalation (above inflation)	2.0%
Annual Power Quality Benefit	$ -

	Annual Operating Cost	Life Cycle Operating Cost & Savings	
		20 years	32 years
Status Quo Transformers	$4,517	$134,254	$272,427
Powersmiths Transformers	$1,479	$43,946	$89,174
Savings with Powersmiths	**$3,039**	**$90,309**	**$183,253**

Cost

	Cost
Powersmiths Transformers	$35,000
Status Quo Transformers	$0

Payback on total cost

	11.52 years		current kWh rate:
Cost of Energy Savings	$ 0.048	**/kWh**	**$0.133**
Cost - Benefit Ratio	2.8	**times less to save a kWh than to buy a kWh**	

Leasing Option

	60 Month Term	48 Month Term	36 Month Term
Total Annual Leasing Payments	**$8,849**	**$10,794**	**$13,734**
Net Annual Cost with savings	$5,811	$7,755	$10,695

Summary of Environmental Benefits

Annual Reduction in Greenhouse Gases (per EPA)	Equivalence
17 tons of CO2	3 Acres trees planted
55 tons of Coal	2 Car Emissions
132 kgs of SO2	2 homes heated
57 kgs of NOx	

IMPORTANT: By using the ESP Calculator™, you are agreeing the TERMS OF USE section on page 3
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Status Quo Transformer (Normal Operation)

Enter the average efficiency of the transformers. While NEMA TP1 is legislated minimum efficiency, it only applies at a single 35% load point, and under ideal linear load profile. Since most transformers are much less loaded than 35%, be sure to use lower efficiency to reflect load level.

Status Quo Transformer (Outside Op. hours)

Transformer efficiency is typically lower than normal when lightly loaded (86-89% when 10-15% loaded for most sizes)

% electronics or Current THD

IEEE Std 1100 and other industry references document transformer losses can more than double when feeding electronics when installled compared to ideal linear load in a manufacturer's factory test.

Transformer Operating Losses

Transformer Losses = kW load/net efficiency - kW load.

A/C Performance (kW/ton)

Varies widely depending on age and technology of cooling system. As low as 0.5 to over 2kW/ton (1.25-1.5 is often tp)
Unlike most substation transformers that are vented to the exterior, most building distribution transformers are ventilated within the building, and their heat losses therefore add to the cooling load.

Powersmiths Efficiency (Normal Operation) & (Outside Op. hours)

Available on Powersmiths product data sheet

Energy Cost escalation (above inflation)

It is well recognized that energy rates are increasing much faster than inflation. Enter the % over inflation

Annual Power Quality Benefit

Savings attributable to reduced downtime, equipment locks & failures associated with poor power quality

Cost

Cost of transformers. Enter dollar figure for transformers under consideration. If the interest is to look at the justification for replacing existing transformers, enter $0 in the conventional transformer cost field.

Energy Operating Cost

Energy OPERATING COST (normal op) = (transformer + cooling) kW losses x kWh rate x hrs/day x days/yr + demand charge
Demand charge is not included in the calculation of losses outside normal hours to be conservative.

Return on Investment (ROI)

ROI on Incremental Cost is based on dividing the Incremental Investment in Powersmiths by the Annual Savings
ROI on Total Transformer Cost is based on dividing the Total Transformer Cost by the Annual Savings

Cost of Energy Savings

In its simplest form, the cost of energy savings represents the cost to save a kWh as opposed to paying for it according to the prevailing kWh rate.

The equation is: Cost of Energy Savings = (Incremental Product Cost / Lifetime kWh saved)

Leasing

Powersmiths Leasing has many benefits, including avoiding the use of capital, offsetting monthly leasing payment with the reduction in monthly energy bill from using Powersmiths

Environmental Benefits

Conversion rates from kWh to emission reduction and equivalent benefits are published by the EPA, and reflect environmental benefits derived from reduced emissions associated with reduced power generation.

TERMS OF USE

Power Quality Institute has used its best efforts in developing the ESP Calculator ™ with the intent of providing an easy to use and useful calculation tool. However, data entered and assumptions made may not accurately reflect all variables that apply in a given facility. The results are therefore estimates only and may differ from actual measurements.
The user is responsible for evaluating the suitability and accuracy of the ESP Calculator ™. The Power Quality Institute and Powersmiths International Corp. make no representations or warranties with respect to the accuracy or completeness of the estimates generated by the ESP Calculator ™ and specifically disclaim any implied warranties of merchantability or fitness for any particular purpose and shall in no event be liable for any loss of profit or any other commercial damage, including, but not limited to special, incidental, consequential or other damages.

OCEAN COUNTY

P.E.E.R. BUILDING & PARKING GARAGE

129 HOOPER AVENUE
TOMS RIVER, NJ 08753

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	General Service Primary (GSP)
Third Party Supplier:	Hess Corporation

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	General Service Large (GSL)
Third Party Supplier:	Hess Corporation

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: JCP&L
Rate: General Service Secondary 3-Phase
Meter No: G28073319
Account No: 10-00-16-6705-39
Third Party Utility Provider: Hess
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Jan-13	138,240	275.0	$15,617
Feb-13	126,720	250.0	$14,456
Mar-13	141,440	274.6	$16,096
Apr-13	158,400	292.8	$17,931
May-13	153,280	291.8	$17,911
Jun-13	183,040	316.5	$21,166
Jul-13	174,400	327.7	$20,349
Aug-13	182,720	313.0	$21,109
Sep-13	134,080	299.2	$15,839
Oct-13	124,160	267.2	$14,609
Nov-13	131,200	274.9	$15,389
Dec-13	125,440	252.8	$14,557
Totals	**1,773,120**	**327.7 Max**	**$205,028**

AVERAGE DEMAND **286.3 KW average**
AVERAGE RATE **$0.116** **$/kWh**

Figure 1
Electricity Usage Profile

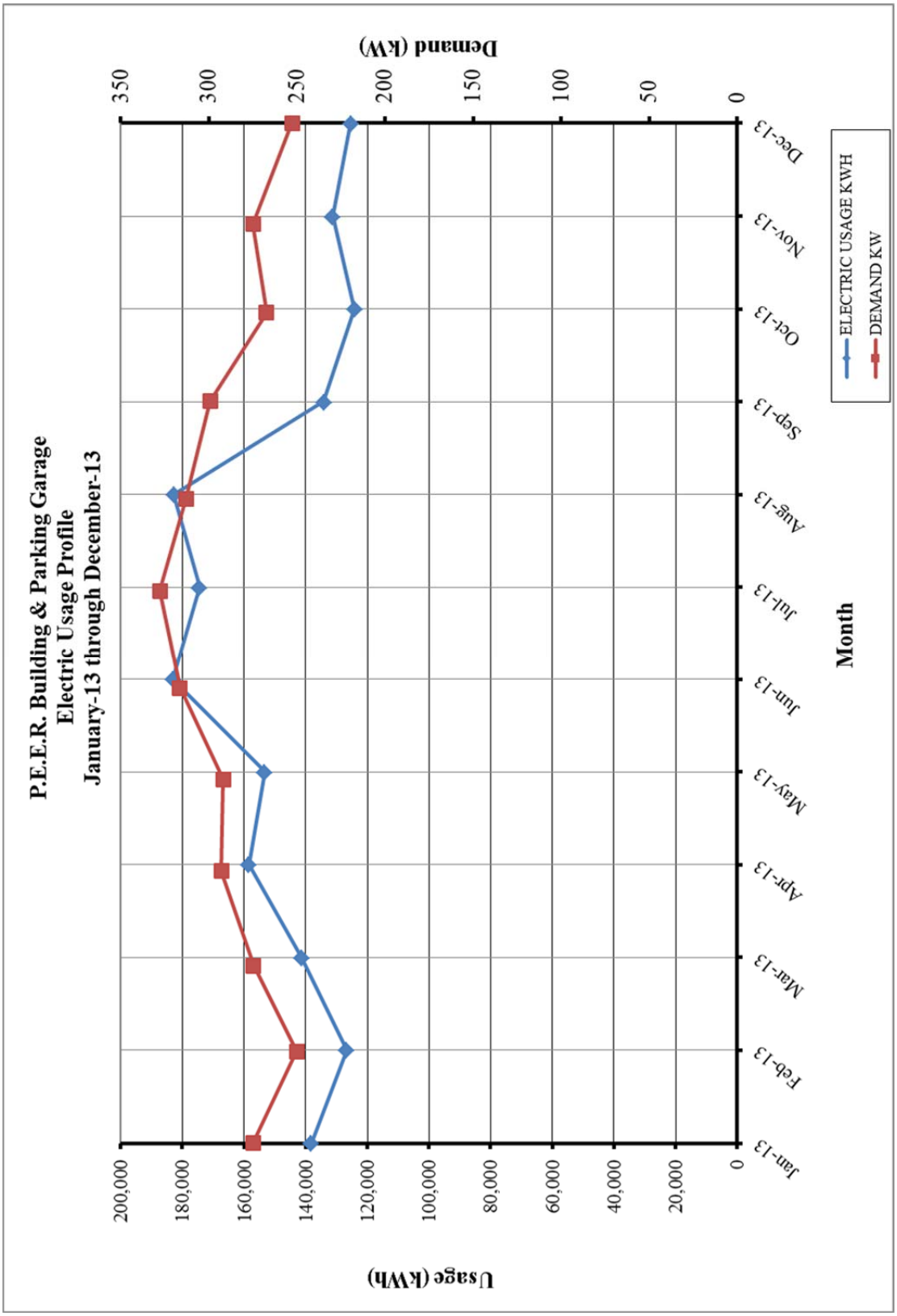
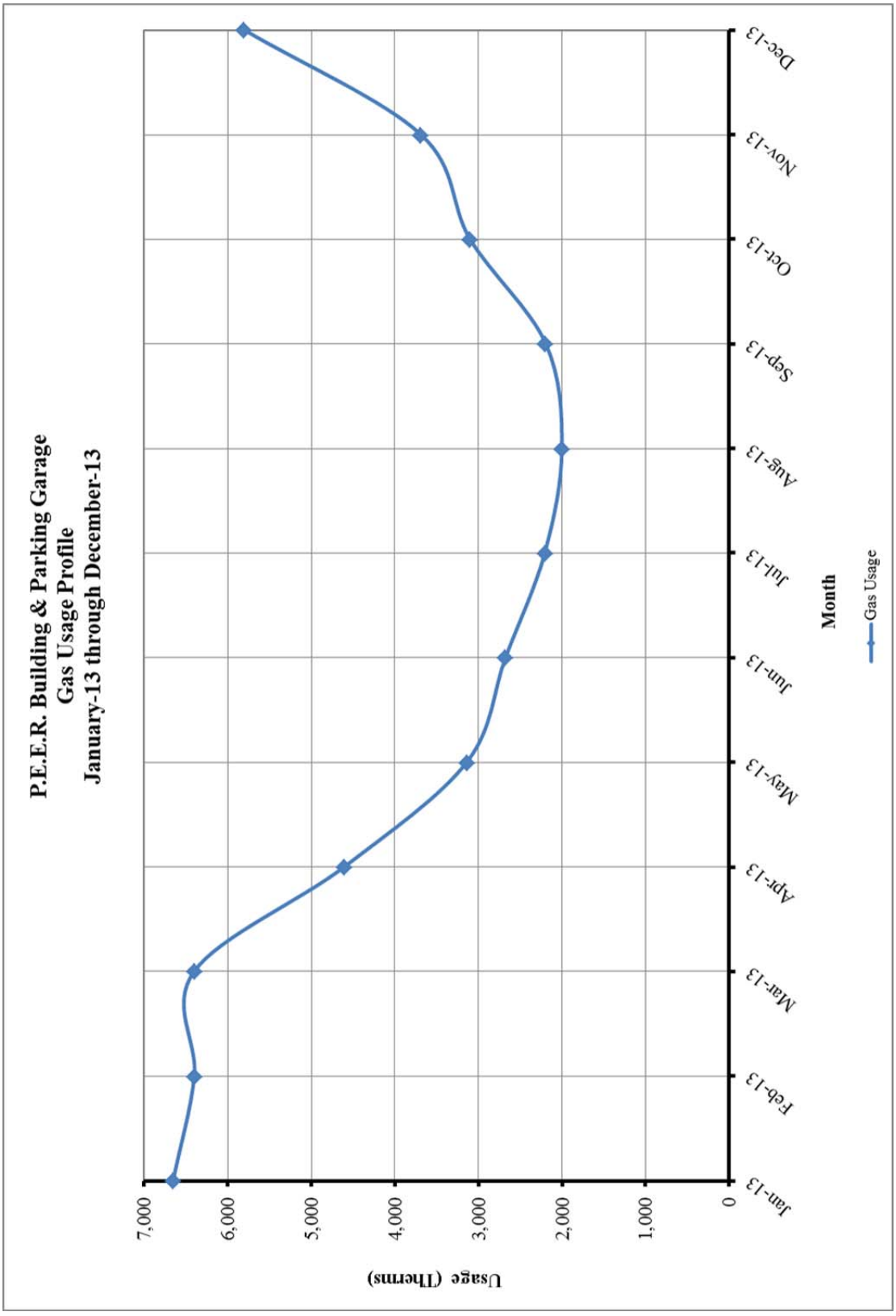


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: New Jersey Natural Gas		
Rate: GSL		
Meter No: 00849119		
Account No: 19-4510-0200-18		
Third Party Utility Provider: Hess		
TPS Meter No: -		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-13	6,655.15	$6,816.10
Feb-13	6,400.67	$6,566.86
Mar-13	6,402.07	$6,653.88
Apr-13	4,604.99	$5,137.10
May-13	3,140.32	$3,718.91
Jun-13	2,677.53	$2,264.25
Jul-13	2,207.00	$2,725.09
Aug-13	2,003.58	$2,449.13
Sep-13	2,196.02	$2,652.74
Oct-13	3,102.70	$3,560.15
Nov-13	3,691.78	$4,026.42
Dec-13	5,806.45	$6,393.16
TOTALS	**48,888.26**	**$52,963.79**
AVERAGE RATE:	**$1.08**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Planning, Engineering, Elections, and Road Department (P.E.E.R.) Building is located at 129 Hooper Avenue in Toms River, New Jersey. This 504,700 SF facility was designed/built in 1991 to 1994 with no additions. The building is a three-story facility attached to a multi-level parking garage. The facility is comprised of offices and open office space, conference rooms, file storage, cafeteria and mechanical HVAC spaces.

Occupancy Profile

The typical hours of operation for most of the facility are Monday through Friday between 8:00 am and 5:00 pm. There are approximately 135 employees that normally occupy the facility.

Building Envelope

Exterior walls for the building are masonry brick faced with a concrete block construction. The windows throughout the facility are in very good condition. Typical windows are double pane, 1/4" with aluminum frames. The roof consists of a rubber membrane over a concrete slab.

HVAC Systems

The P.E.E.R. Building is heated by a Weil-McLain Series 1088, cast iron, sectional, gas-fired, hot water boiler with an input rating of 3,103 MBH and an output of 2,452 for a thermal efficiency of 79% when new. Based on the age and condition of the boiler, Concord Engineering estimates the present thermal efficiency is 70%. Hot water is circulated to various AHU hot water coils, VAV reheat coils, cabinet unit heaters, and fin-tube radiators via three (3) hot water pumps in the boiler room. Two pumps are 3-HP, Bell & Gossett Series 1510 Model 2BC 7.375 BF base-mounted, end suction, centrifugal pumps and the other pump (feeds the baseboard fin-tube radiators) is a 2-HP Bell & Gossett Model BF 8.25 1.25 BC base-mounted, end suction, centrifugal pump. Most areas are heated by VAV boxes with hot water coils or hot water duct coils and most of the perimeter walls are heated by hot water baseboard fin-tube heaters. The restrooms, entrances, mechanical rooms, storage rooms, etc. have hot water cabinet heaters.

Cooling for the P.E.E.R. Building is provided by the following Trane split air handling systems:

Tag No.	Model No.	Total CFM	DX Cooling	HW Coil	S/A Fan	R/A Fan
AHU-1	MCCA017	10,000	288 MBH	81 MBH	10 HP	3 HP
AHU-2	MCCA025	14,000	450 MBH	108 MBH	15 HP	5 HP
AHU-3	MCCA025	15,200	450 MBH	108 MBH	15 HP	5 HP
AHU-4	MCCA030	16,000	465 MBH	108 MBH	15 HP	5 HP
ACCU-1	RAUCC254		320 MBH			
ACCU-2	RAUCC404		500 MBH			

ACCU-3	RAUCC404	516 MBH
ACCU-4	RAUCC404	516 MBH

Each of these air handling units has a variable speed controller for both the supply and return fans. The split air handling units and split condensing units are 23 years old and past their ASHRAE service life of 20 years. These units should be replaced with high-efficiency units.

The kitchen make-up air unit is a Trane gas-fired, rooftop unit rated at 112 MBH input and 89.6 output for a thermal efficiency of 80% when new. This unit has a 2-stage modulation gas burner, a 2-HP supply fan, a 100% outside air inlet hood and is interlocked with the kitchen exhaust hood fan. This unit is 23 years old, in poor condition with an estimated thermal efficiency of 70% at full load and should be replaced with a high-efficiency direct-fired make-up air unit with a thermal efficiency of 92% at full load.

The security office in the parking garage is cooled by a Mitsubishi Electric Model PUZ-A18NHA4 split-system heat pump rated at 1½ -Tons.

Exhaust System

There are numerous rooftop exhaust fans that serve the restrooms, staff/kitchen rooms, reproduction room, conference rooms, employee kitchen, elevator room, kitchen ceiling, and mechanical/electrical rooms. The kitchen hood exhaust fan is a Greenheck fan rated at 2,600 CFM with a 1.5-HP fan.

HVAC System Controls

The heating and cooling is controlled by various thermostats throughout the facility. The heating hot water boiler is controlled by a boiler control panel that includes outside air temperature reset. The Trane split air handling units contain standalone thermostat controls within each space they condition. The cabinet unit heaters, fin-tube radiators and VAV boxes have wall-mounted thermostats.

Domestic Hot Water

The domestic water for this facility (except for the kitchen) is produced by an A. O. Smith Model ECT 40P 200 electric storage tank water heater with a capacity of 40 gallons and an input capacity of 9 kW (2 @ 4.5 kW).

Lighting

Refer to the Investment Grade lighting Audit Appendix for a detailed list of the lighting throughout the facility and estimated operating hours per space.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade - General	$54,800	$6,184	8.9	69.3%
ECM #2	Lighting Upgrade - Exterior & Garage	$248,527	$103,848	2.4	526.8%
ECM #3	Lighting Controls Upgrade	$10,445	$1,126	9.3	61.7%
ECM #4	Boiler Upgrade	$193,750	$12,243	15.8	58.0%
ECM #5	Split System Replacements	$140,225	$4,132	33.9	-55.8%
ECM #6	NEMA Premium Motor Replacements	$2,184	$168	13.0	38.5%
ECM #7	Domestic Hot Water Heater Upgrade	$11,416	$522	21.9	-45.1%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	340 kW Solar Array	$1,631,135	$111,783	14.6	2.8%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
ECM #1	Lighting Upgrade - General	15.0	51,531	0
ECM #2	Lighting Upgrade - Exterior & Garage	100.8	865,403	0
ECM #3	Lighting Controls Upgrade	0.0	9,381	0
ECM #4	Boiler Upgrade	0.0	0	11,336
ECM #5	Split System Replacements	29.7	35,617	0
ECM #6	NEMA Premium Motor Replacements	0.5	1,450	0
ECM #7	Domestic Hot Water Heater Upgrade	0.0	7,723	(346)
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	**DESCRIPTION**	**ANNUAL UTILITY REDUCTION**		
		ELECTRIC DEMAND (KW)	**ELECTRIC CONSUMPTION (KWH)**	**NATURAL GAS (THERMS)**
REM #1	340 kW Solar Array	340.0	411,719	0

Table 3
ECM Emissions Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	GREENHOUSE GAS EMISSIONS REDUCTION		
		CO_2 EMISSIONS (LBS)	NO_X EMISSIONS (LBS)	SO_2 EMISSIONS (LBS)
ECM #1	Lighting Upgrade - General	78,327	144	335
ECM #2	Lighting Upgrade - Exterior & Garage	1,315,413	2,423	5,625
ECM #3	Lighting Controls Upgrade	14,259	26	61
ECM #4	Boiler Upgrade	132,631	104	0
ECM #5	Split System Replacements	54,138	100	232
ECM #6	NEMA Premium Motor Replacements	2,204	4	9
ECM #7	Domestic Hot Water Heater Upgrade	7,691	18	50
Notes:	A. Emissions Reduction based on NJCEP published factors for electric & gas.			

Table 4
Facility Project Summary

FACILITY PROJECT SUMMARY TABLE					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade - General	$6,184	$65,970	$11,170	$54,800	8.9
Lighting Upgrade - Exterior & Garage	$103,848	$284,255	$35,728	$248,527	2.4
Lighting Controls Upgrade	$1,126	$11,100	$655	$10,445	9.3
Boiler Upgrade	$12,243	$199,000	$5,250	$193,750	15.8
Split System Replacements	$4,132	$147,000	$6,775	$140,225	33.9
NEMA Premium Motor Replacements	$168	$2,184	$0	$2,184	13.0
Domestic Hot Water Heater Upgrade	$522	$11,466	$50	$11,416	21.9
Total Project	**$128,223**	**$720,975**	**$59,628**	**$661,347**	**5.2**

Note the measure totals in this table do not take into account interactive effects of measures; see Method of Analysis Section III in Executive Report for further explanation.

The facility peak electrical demand and total project savings meet the qualifications for the Pay for Performance Program. If the owner were to pursue this program option they would receive an estimated $236,364 in incentive dollars, see the Installation Funding Options Section for more detail.

ECM #1: Lighting Upgrade – General

Description:

The majority of the interior lighting throughout P.E.E.R. building is provided with fluorescent fixtures with older generation, 32W T8 lamps and electronic ballasts as well as several areas that contain T12 lamps with magnetic ballasts. Energy savings can be achieved by replacing the existing T8 and T12 lamps with new LED style fixtures. In addition to the fluorescent tube lamps there are additional fixture types consisting of metal halide lamps and incandescent lamps. These too can be retrofitted to LED style lamps.

This ECM includes retrofitting the interior lighting with new LED type fixtures and screw in lamps. It is recommended the County consult with a professional engineer prior to retrofitting fixtures to ensure code required minimum light levels will be met. Additional savings may also be able to be found if it is discovered fixture quantities can be reduced.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	15.0
Electric Usage Savings (kWh)	51,531
Electric Cost Savings ($)	$6,184

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$65,970
NJ Smart Start Equipment Incentive ($):	$11,170
Net Installation Cost ($):	$54,800
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$6,184
Total Yearly Savings ($/Yr):	$6,184
Estimated ECM Lifetime (Yr):	15
Simple Payback	8.9
Simple Lifetime ROI	69.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$92,760
Internal Rate of Return (IRR)	7%
Net Present Value (NPV)	$19,024.19

ECM #2: Lighting Upgrade – Exterior Lighting

Description:

The exterior and garage lighting at the P.E.E.R building is currently lit by metal halide and high pressure sodium fixtures. The exterior would be better served with more efficient LED lighting system. Concord Engineering recommends upgrading the lighting to an energy-efficient LED lighting system that includes LED lamps and fixtures for the existing exterior lighting.

This ECM would replace the existing exterior lamps and fixtures with equivalent LED lamps and fixtures.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in **Investment Grade Lighting Audit Appendix** that outlines the proposed retrofits, costs, savings, and payback periods.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	100.8
Electric Usage Savings (kWh)	865,403
Electric Cost Savings ($)	$103,848

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$284,255
NJ Smart Start Equipment Incentive ($):	$35,728
Net Installation Cost ($):	$248,527
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$103,848
Total Yearly Savings ($/Yr):	$103,848
Estimated ECM Lifetime (Yr):	15
Simple Payback	2.4
Simple Lifetime ROI	526.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$1,557,720
Internal Rate of Return (IRR)	42%
Net Present Value (NPV)	$991,203.68

ECM #3: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the P.E.E.R. building are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for mostly offices. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = \left(\%\ \text{Savings} \times \text{Controlled Light Energy}\ \left(\text{kWh/Yr}\right)\right)$$

$$\text{Savings.} = \text{Energy Savings}\left(\text{kWh}\right) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	9,381
Electric Cost Savings ($)	$1,126

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$11,100
NJ Smart Start Equipment Incentive ($):	$655
Net Installation Cost ($):	$10,445
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,126
Total Yearly Savings ($/Yr):	$1,126
Estimated ECM Lifetime (Yr):	15
Simple Payback	9.3
Simple Lifetime ROI	61.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$16,890
Internal Rate of Return (IRR)	7%
Net Present Value (NPV)	$2,997.11

ECM # 4: Boiler Replacement

Description:

The Ocean County PEER offices are heated by a central hot water boiler located in the boiler room of the building. Hot water is provided by a Weil-McLain Model 1088 gas-fired, cast iron sectional boiler rated for an input capacity of 3,103 MBH and a rated output capacity of 2,452 MBH when new. The boiler was manufactured in 1991, is in average condition, but can be replaced by much more efficient condensing, modular boilers.

CEG recommends replacing this boiler with two 1,500 MBH high-efficiency condensing modular hot water boilers. Condensing boilers can substantially improve the operating efficiency of the heating system of the building. A condensing boiler's peak efficiency tops out at 98% depending on return water temperature. The natural gas to water efficiency for a 1,500 MBH boiler with digital burner controls is approximately 92% over its operating range and with the advanced controls and a 20:1 turn down ratio.

This energy conservation measure will replace the existing Weil-McLain gas-fired, cast iron, sectional boiler serving the facility with two, high-efficiency, modular, condensing heating hot water boilers. Calculation is based on the following equipment: Aerco Benchmark 1500, modular, condensing hot water boiler or equivalent.

Energy Savings Calculations:

Gas consumption of the boiler plant is gathered in order to calculate the estimated heat output of the existing boiler. It is confirmed that the boiler is for space heating only and does not provide domestic hot water heating.

The annual gas consumption is used in a reverse calculation in the below equations to obtain proposed annual gas consumption based on improved efficiency. Calculations are summarized in the table below.

$$\text{Annual Output, MMBTU} = \frac{\text{Consumption (Therms)} \times 100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ Current Boiler Effc}}{1{,}000{,}000}$$

$$\text{Proposed Gas Consumption, Therms} = \frac{\text{Annual Output (MMBTU)} \times 1{,}000{,}000}{100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ New Boiler Efficiency}}$$

HIGH EFFICIENCY BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Cast Iron Boiler	New High Efficiency Boilers	
Existing Nat Gas (Therms)	47,405		
Boiler Efficiency (%)	70.0%	92.0%	22%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	3,318	3,318	
Gas Cost ($/Therm)	$1.08	$1.08	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	47,405	36,069	11,336
Energy Cost ($)	$51,197	$38,955	$12,243
COMMENTS:	Boiler Efficiency Based on age of boiler		

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$199,000
NJ Smart Start Equipment Incentive ($):	$5,250
Net Installation Cost ($):	$193,750
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$12,243
Total Yearly Savings ($/Yr):	$12,243
Estimated ECM Lifetime (Yr):	25
Simple Payback	15.8
Simple Lifetime ROI	58.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$306,075
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$19,439.17

ECM #5: Split System Replacements

Description:

The PEER building has four (4) Trane Model RAUCC split system air conditioning only units which serve the main four air handling units for the building. The estimated existing unit efficiencies are 9.8 EER. These split system units have surpassed their ASHRAE service life expectancy of 15 years. Replacing these units with newer more efficient units would result in significant energy savings.

The units currently installed have lower efficiencies compared to modern high-efficiency units. New units provide higher full load and part load efficiencies due to advances in inverter motor technologies, higher efficiency refrigerants such as R410A which would be used in place of R22 that is currently used in the units.

This ECM includes replacement of this older condensing units and evaporator coils within each air handler with a new higher efficiency condensing units and R-410A coils. It is recommended to fully evaluate the capacity needed for the new split system units prior to moving forward with this ECM. A summary of the unit replacements for this ECM can be found in the table below:

IMPLEMENTATION SUMMARY					
ECM INPUTS	**SERVICE FOR**	**NUMBER OF UNITS**	**COOLING CAPACITY, BTU/HR**	**TOTAL CAPACITY, TONS**	**REPLACE UNIT WITH**
SS	Split System	1	300,000	25.0	Trane RAUJ
SS	Split System	1	480,000	40.0	Trane RAUJ
SS	Split System	1	480,000	40.0	Trane RAUJ
SS	Split System	1	480,000	40.0	Trane RAUJ
Total		**4**	**1,740,000**	**145.0**	

The high-efficiency split system used as the basis for the calculation is a Trane Model RAUJ. The unit pricing and install costs were estimated based on current rates quotes and labor rates. The payback may change based on actual unit pricing and installed costs if the ECM is implemented.

Energy Savings Calculations:

Cooling Energy Savings:

Seasonal energy consumption of the air conditioners at the cooling mode is calculated with the equation below:

$$\text{Energy Savings, kWh} = \text{Cooling Capacity,} \frac{\text{BTU}}{\text{Hr}} \times \left(\frac{1}{\text{SEER}_{\text{Old}}} - \frac{1}{\text{SEER}_{\text{New}}} \right) \times \frac{\text{Operation Hours}}{1000 \frac{\text{W}}{\text{kWh}}}$$

$$\text{Demand Savings, kW} = \frac{\text{Energy Savings (kWh)}}{\text{Hours of Cooling}}$$

$$\text{Cooling Cost Savings} = \text{Energy Savings, kWh} \times \text{Cost of Electricity}\left(\frac{\$}{\text{kWh}}\right)$$

ENERGY SAVINGS CALCULATIONS							
ECM INPUTS	**EXISTING COOLING CAPACITY, BTU/Hr**	**ANNUAL COOLING HOURS**	**EXISTING UNIT EER**	**NEW UNIT EER**	**# OF UNITS**	**ENERGY SAVINGS kWh**	**DEMAND SAVINGS kW**
SS	300,000	1,200	9.8	12.1	1	6,983	5.8
SS	480,000	1,200	9.8	11.7	1	9,545	8.0
SS	480,000	1,200	9.8	11.7	1	9,545	8.0
SS	480,000	1,200	9.8	11.7	1	9,545	8.0
Total					4	35,617	29.7

Project Cost, Incentives and Maintenance Savings

From the NJ Smart Start® Program appendix, the replacement of split system AC units and unitary systems with high efficiency AC systems falls under the category "Unitary HVAC Split System" and warrants an incentive based on efficiency (EER/SEER). The program incentives are calculated as follows:

$$\text{SmartStart® Incentive} = (\text{Cooling Tons} \times \$/\text{Ton Incentive})$$

AC UNITS REBATE SUMMARY				
UNIT DESCRIPTION	**UNIT EFFICIENCY**	**REBATE $/TON**	**PROPOSED CAPACITY TONS**	**TOTAL REBATE $**
≥20 to 30 tons	10.5 EER	79	25	$1,975
> 30 to < 63 tons	9.5 EER	40	120	$4,800
TOTAL			**145**	**$6,775**

Summary of cost, savings and payback for this ECM is below.

COST & SAVINGS SUMMARY							
ECM INPUTS	**INSTALLED COST**	**# OF UNITS**	**TOTAL COST**	**REBATES**	**NET COST**	**ENERGY SAVINGS**	**PAY BACK YEARS**
SS	$25,800	1	$25,800	$1,975	$23,825	$810	29.4
SS	$40,400	1	$40,400	$1,600	$38,800	$1,107	35.0
SS	$40,400	1	$40,400	$1,600	$38,800	$1,107	35.0
SS	$40,400	1	$40,400	$1,600	$38,800	$1,107	35.0
Total	$147,000	4	$147,000	$6,775	$140,225	$4,132	33.9

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$147,000
NJ Smart Start Equipment Incentive ($):	$6,775
Net Installation Cost ($):	$140,225
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,132
Total Yearly Savings ($/Yr):	$4,132
Estimated ECM Lifetime (Yr):	15
Simple Payback	33.9
Simple Lifetime ROI	-55.8%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$61,980
Internal Rate of Return (IRR)	-9%
Net Present Value (NPV)	($90,897.45)

ECM #6: Install NEMA Premium® Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving three hot water pumps (P-1 and P-2) are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors. NEMA Premium® is the most efficient motor designation in the marketplace today. (Note: There are currently no NJ OCE incentives for premium efficiency motors.)

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
P-1	Heating Hot Water Pump	3	2,745	78.5%	89.5%
P-2	Heating Hot Water Pump	3	2,745	78.5%	89.5%

Energy Savings Calculations:

$$\text{Electric usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate} \left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	QTY	MOTOR HP	LOAD FACTOR	EXISTING EFFICIENCY	PROPOSED EFFICIENCY	POWER SAVINGS kW	ENERGY SAVINGS kWH	COST SAVINGS
P-1	1	3	75%	78.5%	89.5%	0.26	725	$84
P-2	1	3	75%	78.5%	89.5%	0.26	725	$84
TOTAL						**0.5**	**1,450**	**$168**

Equipment Cost

The following table outlines the summary of motor replacement costs:

MOTOR REPLACEMENT SUMMARY						
EQMT ID	MOTOR POWER HP	INSTALLED COST	SMART START INCENTIVE	NET COST	TOTAL SAVINGS	SIMPLE PAYBACK
P-1	3	$1,092	$0	$1,092	$84	13.0
P-2	3	$1,092	$0	$1,092	$84	13.0
TOTAL		**$2,184**	**$0**	**$2,184**	**$168**	**13.0**

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,184
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$2,184
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$168
Total Yearly Savings ($/Yr):	$168
Estimated ECM Lifetime (Yr):	18
Simple Payback	13.0
Simple Lifetime ROI	38.5%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$3,024
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$126.59

ECM #8: Domestic Hot Water Heater Upgrade

Description:

The domestic water for this facility (except for the kitchen) is produced by an A. O. Smith Model ECT 40P 200 electric storage tank water heater with a capacity of 40 gallons and an input capacity of 9 kW (2 @ 4.5 kW). Maintaining an electric hot water heater for a building this size is not cost effective and upgrading to a natural gas-fired unit may incur significant cost savings.

This ECM will replace this electric domestic water heater with a natural gas-fired 0.70 energy factor A.O. Smith Effex Series water heater. This unit will be replaced with a 40 MBH, 40 gallon tank water heater. (Before proceeding with installation of aforementioned system, Concord Engineering suggests consulting a mechanical engineer to evaluate the system fully.)

Energy Savings Calculations:

DOM. HOT WATER HEATER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Electric Hot Water Heaters	High Efficiency Heaters	
Building Type	Office		
Building Square-foot	48,500	48,500	
Domestic Water Usage, kBtu	24,250.00	24,250.00	
DHW Heating Fuel Type	Electric	Gas	
Heating Efficiency	98%	95%	-3%
Total Usage (kBTU)	24,745	25,526	-781
Electric Cost ($/kWh)	$ 0.116	$ -	
Nat Gas Cost ($/Therm)		$ 1.080	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Usage (kWh)	7,250	0	7,250
Natural Gas Usage (Therms)	0	255	-255
Energy Cost ($)	$841	$276	$565
COMMENTS:	Savings are based on Energy Information Administration Commercial Building Energy Consumption Survey 2003 Information		

Energy Density for "Other" type building = 0.5 kBtu / SF / year

$$DHW\ Heat\ Usage = Energy\ Density\left(\frac{kBtu\ yr}{SF}\right) \times Building\ Square\ Footage\ (SF)$$

$$DHW\ Total\ Usage = \frac{Dom\ HW\ Heat\ Cons.(Btu)}{Heating\ Eff.(\%) \times Fuel\ Heat\ Value\left(\frac{BTU}{Fuel\ Unit}\right)}$$

$$Energy\ Cost = Heating\ Fuel\ Usage(Fuel\ Units) \times Ave\ Fuel\ Cost\left(\frac{\$}{Fuel\ Unit}\right)$$

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$11,466
NJ Smart Start Equipment Incentive ($):	$50
Net Installation Cost ($):	$11,416
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$522
Total Yearly Savings ($/Yr):	$522
Estimated ECM Lifetime (Yr):	12
Simple Payback	21.9
Simple Lifetime ROI	-45.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$6,264
Internal Rate of Return (IRR)	-8%
Net Present Value (NPV)	($6,220.01)

REM #1: 342.96 kW Solar System

Description:

The P.E.E.R. building and garage has available roof space that could accommodate a significant amount of solar generation. Based on the available areas a 342.96 kilowatt solar array could be installed. The array will produce approximately 411,719 kilowatt-hours annually that will reduce the overall electric usage of the facility by 23.22%.

Energy Savings Calculations:

See **Renewable / Distributed Energy Measures Calculations Appendix** for detailed financial summary and proposed solar layout areas. Financial results in table below are based on 100% financing of the system over a fifteen year period.

Energy Savings Summary:

REM #1 - ENERGY SAVINGS SUMMARY	
System Size (KW_{DC}):	342.96
Electric Generation (KWH/Yr):	411,719
Installation Cost ($):	$1,631,135
SREC Revenue ($/Yr):	$62,377
Energy Savings ($/Yr):	$49,406
Total Yearly Savings ($/Yr):	$111,783
ECM Analysis Period (Yr):	15
Simple Payback (Yrs):	14.6
Analysis Period Electric Savings ($):	$918,903
Analysis Period SREC Revenue ($):	$903,605
Net Present Value (NPV)	($492,574.78)

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures. While facility staff may already perform some of these items, they are stated to remind the owner of the energy savings benefit of continual performance. These measures are typically not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode.

F. Replace any old CRT Monitors with LED/LCD Type Monitors, which can draw as much as a quarter the power of an equivalent CRT monitor.

G. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Ocean County - P.E.E.R. Building & Parking Garage

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY														
ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade - General	$33,330	$32,640	$11,170	$54,800	$6,184	$0	$6,184	15	$92,760	$0	69.3%	8.9	7.44%	$19,024.19
ECM #2	Lighting Upgrade - Exterior & Garage	$144,090	$140,165	$35,728	$248,527	$103,848	$0	$103,848	15	$1,557,720	$0	526.8%	2.4	41.56%	$991,203.68
ECM #3	Lighting Controls Upgrade	$7,700	$3,400	$655	$10,445	$1,126	$0	$1,126	15	$16,890	$0	61.7%	9.3	6.71%	$2,997.11
ECM #4	Boiler Upgrade	$95,000	$104,000	$5,250	$193,750	$12,243	$0	$12,243	25	$306,075	$0	58.0%	15.8	3.88%	$19,439.17
ECM #5	Split System Replacements	$93,500	$53,500	$6,775	$140,225	$4,132	$0	$4,132	15	$61,980	$0	-55.8%	33.9	-8.81%	($90,897.45)
ECM #6	NEMA Premium Motor Replacements	$1,500	$684	$0	$2,184	$168	$0	$168	18	$3,024	$0	38.5%	13.0	3.68%	$126.59
ECM #7	Domestic Hot Water Heater Upgrade	$5,755	$5,711	$50	$11,416	$522	$0	$522	12	$6,264	$0	-45.1%	21.9	-8.21%	($6,220.01)
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	340 kW Solar Array	$978,681	$652,454	$0	$1,631,135	$49,406	$62,377	$111,783	15	$1,676,745	$935,655	2.8%	14.6	0.35%	($296,676.80)

Notes:
1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives from July 1, 2013 to June 30, 2014:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Cooling

Gas Absorption Chillers	$185 - $450 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $92 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

Closed Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps ≥ 20 hp	$60 per VFD rated hp
Rotary Screw Air Compressors ≥ 25 hp	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot (For fixtures ≥ 150w)	$25 per fixture
HID ≥ 100w Replace with new induction fixture. (must be 30% less watts/fixture than HID system)	$70 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Stairwell and Passageway Luminaires	$40 per fixture
LED Bollard Fixtures	$50 per fixture
Luminaires for Ambient Lighting of Interior Commercial Spaces (1x4, 2x2, 2x4)	$50 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$10 per lamp for R/PAR20,MR/PAR16,Globe,Candelabra or Misc $20 per lamp for R/BR/PAR 30, R/BR/PAR 38-40, A-Lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted (Existing Facilities Only)	$20 per control
Remote Mounted (Existing Facilities Only)	$35 per control
Daylight Dimming Controls	$45 per fixture controlled
Occupancy Based hi-low Dimming Control	$35 per fixture controlled
Occupancy Sensor Remote Mounted	$35 per control

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and an IRR of at least 10%.

APPENDIX C

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

PEER - Parking Garage

Primary Property Function: Parking
Gross Floor Area (ft²): 48,500
Built: 1992

For Year Ending: December 31, 2013
Date Generated: May 23, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
PEER - Parking Garage 129 Hooper Avenue Toms River, New Jersey 08753	Ocean County 239 Washington Street Building #5 Toms River, NJ 08753 (____)____-_____	Joseph Meyers 239 Washington Street Building #5 Toms River, NJ 08753 732-929-2039 JosephMeyers@co.ocean.nj.us

Property ID: 4046943

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
129.4 kBtu/ft²

Source EUI
194.2 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	4,919,875 (78%)
Electric - Grid (kBtu)	1,355,101 (22%)

National Median Comparison	
National Median Site EUI ()	N/A
National Median Source EUI ()	N/A
% Diff from National Median Source EUI	N/A%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	433

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

P.E.E.R. BUILDING

Split System Units

Tag	ACCU-1	ACCU-2	ACCU-3	ACCU-4
Unit Type	Split Air-Cooled Condensing Unit	Split Air-Cooled Condensing Unit	Split Air-Cooled Condensing Unit	Split Air-Cooled Condensing Unit
Qty	1	1	1	1
Location	Roof	Roof	Roof	Roof
Unit Served	AHU-1	AHU-2	AHU-3	AHU-4
Manufacturer	Trane	Trane	Trane	Trane
Model #	RAUCC254	RAUCC404	RAUCC404	RAUCC404
Serial #	J91K82192	J91K82193	J91K82194	J91K82195
Cooling Type	DX Coil	DX Coil	DX Coil	DX Coil
Cooling Capacity	25 Tons	40 Tons	40 Tons	40 Tons
Cooling Efficiency (SEER/EER)	11.1 EER	11.5 EER	11.5 EER	11.5 EER
Fuel	Electric	Electric	Electric	Electric
Approx Age	23	23	23	23
ASHRAE Service Life	20	20	20	20
Remaining Life	(3)	(3)	(3)	(3)
Comments				

Note:

"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

P.E.E.R. BUILDING

AHUs

Tag	AHU-1	AHU-2	AHU-3	AHU-4
Unit Type	Split Air Handling Unit	Split Air Handling Unit	Split Air Handling Unit	Split Air Handling Unit
Qty	1	1	1	1
Location	Mechanical Room	Mechanical Room	Mechanical Room	Mechanical Room
Area Served				
Manufacturer	Trane Modular Climate Changer	Trane Modular Climate Changer	Trane Modular Climate Changer	Trane Modular Climate Changer
Model #	MCCA017	MCCA025	MCCA025	MCCA030
Serial #	K91M47455	K91L43671	K91L43675	K91L43679
Cooling Type	DX Coil	DX Coil	DX Coil	DX Coil
Cooling Capacity	288 MBH	450 MBH	450 MBH	465 MBH
Heating Type	HW Coil	HW Coil	HW Coil	HW Coil
Heating Capacity	81 MBH	108 MBH	108 MBH	108 MBH
Heating Efficiency	79% (Plant)	79% (Plant)	79% (Plant)	79% (Plant)
Supply Fan (HP)	10	15	15	15
Return Fan (HP)	3	5	3	5
Approx Age	23	23	23	23
ASHRAE Service Life	20	20	20	20
Remaining Life	(3)	(3)	(3)	(3)
Comments	VFD on Supply & Return Fans	VFD on Supply & Return Fans	VFD on Supply & Return Fans	VFD on Supply & Return Fans

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

P.E.E.R. BUILDING

Domestic Water Heaters

Tag	DHW-1	
Unit Type	Electric Storage Tank Water Heater	
Qty	1	
Location	Mechanical Room	
Area Served	Entire Facility (Except Kitchen)	
Manufacturer	A. O. Smith	
Model #	ECT 40P 200	
Serial #	1339A021071	
Size (Gallons)	40	
Input Capacity (MBH/KW)	9 kW (2 @ 4.5 kW)	
Recovery (Gal/Hr)	-	
Efficiency %	95%	
Fuel	Electric	
Approx Age	1	
ASHRAE Service Life	15	
Remaining Life	14	
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

PEER BUILDING

Boilers

Tag	B-1
Unit Type	Cast Iron Sectional
Qty	1
Location	Boiler Room
Area Served	Entire Facility
Manufacturer	Weil-McLain
Model #	1088
Serial #	
Input Capacity	3,103 MBH
Rated Output Capacity	2,452 MBH
Approx. Efficiency %	79%
Fuel	Natural Gas
Approx Age	23
ASHRAE Service Life	30
Remaining Life	7
Comments	Power Flame Burner Model No. WCR2-GO-20B 1 HP Marathon Blower Motor

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

P.E.E.R. BUILDING

Pumps

Tag	P-1	P-2	P-3
Unit Type	Base Mounted End Suction Pump	Base Mounted End Suction Pump	Base Mounted End Suction Pump
Qty	1	1	1
Location	Mechanical Room	Mechanical Room	Mechanical Room
Area Served	Boiler Main Pump	Boiler Aux. Pump	Baseboard HHW Pump
Manufacturer	Bell & Gossett 1510	Bell & Gossett 1510	Bell & Gossett 1510
Model #	2BC 7.375 BF	2BC 7.375 BF	BF 8.25 1.25 BC
Serial #	1727418	"-"	C000339 D50
Horse Power	3	3	2
Flow	125 GPM @ 50' TDH	125 GPM @ 50' TDH	40GPM @ 70 TDH
Motor Info	U. S. Electric	U. S. Electric	A. O. Smith
Electrical Power	208-230/460	208-230/460	208-230/460
RPM	1730	1730	1745
Motor Efficiency %	78.5%	78.5%	84.0%
Approx Age	23	23	23
ASHRAE Service Life	20	20	20
Remaining Life	(3)	(3)	(3)
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

P.E.E.R. BUILDING

Make-Up Air

Tag	MUA-1		
Unit Type	Rooftop Unit		
Qty	1		
Location	Roof		
Area Served	Kitchen		
Manufacturer	Trane		
Model #	"-"		
Serial #	"-"		
Heating Type	Heat Exchanger		
Heating Input (MBH)	112		
Heating Output (MBH)	89.6		
Efficiency	70% (Existing Condition)		
Fuel	Natural Gas		
Approx Age	23		
ASHRAE Service Life	20		
Remaining Life	(3)		
Comments	Interlocked with Kitchen Hood Fan		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

APPENDIX E

CEG Project #: 1C14065
Facility Name: P.E.E.R & Parking Garage
Address: 129 Hooper Avenue
City, State, Zip Toms River, NJ 08753

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
3rd Floor																																		
900	Conf. Room A	3000	Recessed Down Light, 2 Lamp, 18w PL	2	36	20	0.72	2,160	Existing to Remain	No Change	2	36	0	0.72	2,160	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	432	$52	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	$20.00	1.54
222.22	Corridor	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,339	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	778	0.16	562	$67	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$120.00	8.90	$0.00	$0.00	$0.00	FALSE	-
227.21	Corridor	3600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	1	0.06	223	Remove Fixture; Install New Fixture	Lithonia LED 2x2	1	31	1	0.03	112	0.03	112	$13	0	No New Controls	0	0.0%	0	$0	$120.00	$40.00	$160.00	$20.00	10.45	$0.00	$0.00	$0.00	FALSE	-
902	Men's Restroom	2600	100w R40 Flood	1	100	1	0.10	260	Relamp	12w LED R40	1	12	1	0.01	31	0.09	229	$27	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	6	$1	$20.00	$20.00	$40.00	$10.00	1.09	$25.00	$25.00	$50.00	FALSE	66.77
221.21	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	19	$2	$60.00	$60.00	$120.00	$20.00	12.33	$25.00	$25.00	$50.00	FALSE	22.26
902	Women's Restroom	2600	100w R40 Flood	1	100	1	0.10	260	Relamp	12w LED R40	1	12	1	0.01	31	0.09	229	$27	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	6	$1	$20.00	$20.00	$40.00	$10.00	1.09	$25.00	$25.00	$50.00	FALSE	66.77
221.21	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	19	$2	$60.00	$60.00	$120.00	$20.00	12.33	$25.00	$25.00	$50.00	FALSE	22.26
Engineering Dept.																																		
222.22	Receptionist	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	648	0.16	468	$56	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$120.00	10.68	$0.00	$0.00	$0.00	FALSE	-
222.22	Conf. Room B	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	372	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	216	0.05	156	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	43	$5	$120.00	$120.00	$240.00	$40.00	10.68	$50.00	$50.00	$100.00	FALSE	19.29
222.22	Open Office - West	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	32	1.98	5,952	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	32	1.15	3,456	0.83	2,496	$300	5	Dual Technology Occupancy Sensor - Remote Mnt.	3	20.0%	691	$83	$1,920.00	$1,920.00	$3,840.00	$640.00	10.68	$600.00	$150.00	$750.00	$35.00	8.62
227.221	Open Office - West	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	1	0.03	102	Existing to Remain	No Change	2	34	0	0.03	102	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
222.22	Copy/Files	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	3	0.19	558	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	324	0.08	234	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	65	$8	$180.00	$180.00	$360.00	$60.00	10.68	$50.00	$50.00	$100.00	$20.00	10.29
222.22	Side Offices (3) - North Corner	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	13	0.81	2,418	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	13	0.47	1,404	0.34	1,014	$122	6	Dual Technology Occupancy Sensor - Switch Mnt.	3	20.0%	281	$34	$780.00	$780.00	$1,560.00	$260.00	10.68	$150.00	$150.00	$300.00	$20.00	8.31
222.22	Conf. Room C	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	648	0.16	468	$56	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	130	$16	$360.00	$360.00	$720.00	$120.00	10.68	$50.00	$50.00	$100.00	$20.00	5.14
227.221	Kitchenette	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	3	0.10	306	Existing to Remain	No Change	2	34	0	0.10	306	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
221.21	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
221.21	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
222.21	Open Office - East Corner	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	28	1.74	5,208	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	28	1.01	3,024	0.73	2,184	$262	5	Dual Technology Occupancy Sensor - Remote Mnt.	3	20.0%	605	$73	$1,680.00	$1,680.00	$3,360.00	$560.00	10.68	$600.00	$150.00	$750.00	$35.00	9.85
227.221	Open Office - East Corner	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	2	0.07	204	Existing to Remain	No Change	2	34	0	0.07	204	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
222.22	Corner Office - East	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	744	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	432	0.10	312	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$10	$240.00	$240.00	$480.00	$80.00	10.68	$50.00	$50.00	$100.00	$20.00	7.72
222.22	File Room	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	648	0.16	468	$56	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	130	$16	$360.00	$360.00	$720.00	$120.00	10.68	$25.00	$25.00	$50.00	$20.00	1.93
227.221	File Room	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	3	0.10	306	Existing to Remain	No Change	2	34	0	0.10	306	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	61	$7	$0.00	$0.00	$0.00	$0.00	-	$25.00	$25.00	$50.00	FALSE	6.81
222.22	Open Office - South	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	25	1.55	4,650	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	25	0.90	2,700	0.65	1,950	$234	5	Dual Technology Occupancy Sensor - Remote Mnt.	3	20.0%	540	$65	$1,500.00	$1,500.00	$3,000.00	$500.00	10.68	$600.00	$150.00	$750.00	$35.00	11.03
222.22	Print Room	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	372	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	216	0.05	156	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	43	$5	$120.00	$120.00	$240.00	$40.00	10.68	$50.00	$50.00	$100.00	FALSE	19.29
222.22	Corner Office - South	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	11	0.68	2,046	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	11	0.40	1,188	0.29	858	$103	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	238	$29	$660.00	$660.00	$1,320.00	$220.00	10.68	$50.00	$50.00	$100.00	$20.00	2.81
2nd Floor																																		
222.22	Lobby	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,339	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	778	0.16	562	$67	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$120.00	8.90	$0.00	$0.00	$0.00	FALSE	-
227.221	Lobby	3600	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	6	0.20	734	Existing to Remain	No Change	2	34	0	0.20	734	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
902	Men's Restroom	2600	100w R40 Flood	1	100	1	0.10	260	Relamp	12w LED R40	1	12	1	0.01	31	0.09	229	$27	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	6	$1	$20.00	$20.00	$40.00	$10.00	1.09	$25.00	$25.00	$50.00	FALSE	66.77

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
221.21	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	19	$2	$60.00	$60.00	$120.00	$20.00	12.33	$25.00	$25.00	$50.00	FALSE	22.26
902	Women's Restroom	2600	100w R40 Flood	1	100	1	0.10	260	Relamp	12w LED R40	1	12	1	0.01	31	0.09	229	$27	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	6	$1	$20.00	$20.00	$40.00	$10.00	1.09	$25.00	$25.00	$50.00	FALSE	66.77
221.21	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	1	0.06	161	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	94	0.03	68	$8	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	19	$2	$60.00	$60.00	$120.00	$20.00	12.33	$25.00	$25.00	$50.00	FALSE	22.26
Road Dept																																		
222.22	Receptionist	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	372	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	216	0.05	156	$19	0	No New Controls	0	0.0%	0	$0	$120.00	$120.00	$240.00	$40.00	10.68	$0.00	$0.00	$0.00	FALSE	-
222.22	Reception Desk/Office	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	648	0.16	468	$56	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$120.00	10.68	$0.00	$0.00	$0.00	FALSE	-
222.22	Conf. Room	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	744	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	432	0.10	312	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$10	$240.00	$240.00	$480.00	$80.00	10.68	$50.00	$50.00	$100.00	$20.00	7.72
222.22	Open Office - West	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	12	0.74	2,232	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	12	0.43	1,296	0.31	936	$112	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	259	$31	$720.00	$720.00	$1,440.00	$240.00	10.68	$200.00	$50.00	$250.00	$35.00	6.91
222.22	Corridor	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	7	0.43	1,562	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	7	0.25	907	0.18	655	$79	0	No New Controls	0	0.0%	0	$0	$420.00	$420.00	$840.00	$140.00	8.90	$0.00	$0.00	$0.00	FALSE	-
222.22	Side Offices (3) - North Corner	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	13	0.81	2,418	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	13	0.47	1,404	0.34	1,014	$122	6	Dual Technology Occupancy Sensor - Switch Mnt.	3	20.0%	281	$34	$780.00	$780.00	$1,560.00	$260.00	10.68	$150.00	$150.00	$300.00	$20.00	8.31
222.22	Copy Room	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	1	0.06	186	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	108	0.03	78	$9	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$20.00	10.68	$0.00	$0.00	$0.00	FALSE	-
227.221	Kitchenette	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	3	0.10	306	Existing to Remain	No Change	2	34	0	0.10	306	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
222.22	File Room	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	3	0.19	558	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	324	0.08	234	$28	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	65	$8	$180.00	$180.00	$360.00	$60.00	10.68	$50.00	$50.00	$100.00	$20.00	10.29
221.21	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
221.21	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
Cafeteria																																		
221.37	Training Room	3000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	2	62	8	0.50	1,488	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	864	0.21	624	$75	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$160.00	10.68	$0.00	$0.00	$0.00	FALSE	-
221.37	Cafeteria	3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Indirect	2	62	54	3.35	12,053	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	54	1.94	6,998	1.40	5,054	$607	3	Daylight Sensor (Sensorswitch PP-20 & CM-PC or equal)	4	20.0%	1,400	$168	$3,240.00	$3,240.00	$6,480.00	$1,080.00	8.90	$1,200.00	$200.00	$1,400.00	FALSE	8.34
232.21	Elevator Lobby	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	1	0.06	202	0.04	137	$16	0	No New Controls	0	0.0%	0	$0	$80.00	$60.00	$140.00	$30.00	6.70	$0.00	$0.00	$0.00	FALSE	-
232.21	Serving Line	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	8	0.75	2,707	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	8	0.45	1,613	0.30	1,094	$131	0	No New Controls	0	0.0%	0	$0	$640.00	$480.00	$1,120.00	$240.00	6.70	$0.00	$0.00	$0.00	FALSE	-
232.21	Kitchen	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	5	0.47	1,692	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	5	0.28	1,008	0.19	684	$82	0	No New Controls	0	0.0%	0	$0	$400.00	$300.00	$700.00	$150.00	6.70	$0.00	$0.00	$0.00	FALSE	-
1st Floor																																		
222.22	Lobby	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	5	0.31	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	648	0.13	468	$56	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$100.00	8.90	$0.00	$0.00	$0.00	FALSE	-
227.221	Lobby	3600	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	7	0.24	857	Existing to Remain	No Change	2	34	0	0.24	857	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
Planning & Solid Waste																																		
222.22	Waiting Area	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	5	0.31	930	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	540	0.13	390	$47	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$100.00	10.68	$0.00	$0.00	$0.00	FALSE	-
222.22	Reception	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	5	0.31	930	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	5	0.18	540	0.13	390	$47	0	No New Controls	0	0.0%	0	$0	$300.00	$300.00	$600.00	$100.00	10.68	$0.00	$0.00	$0.00	FALSE	-
222.22	Mapping	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	648	0.16	468	$56	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	130	$16	$360.00	$360.00	$720.00	$120.00	10.68	$200.00	$50.00	$250.00	$35.00	13.82
222.22	Open Office - West	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	20	1.24	3,720	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	20	0.72	2,160	0.52	1,560	$187	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	432	$52	$1,200.00	$1,200.00	$2,400.00	$400.00	10.68	$400.00	$100.00	$500.00	$35.00	8.97
222.22	Corridor	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	8	0.50	1,786	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	1,037	0.21	749	$90	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$160.00	8.90	$0.00	$0.00	$0.00	FALSE	-
232.21	Copy Area	3000	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	6	0.56	1,692	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	56	6	0.34	1,008	0.23	684	$82	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	202	$24	$480.00	$360.00	$840.00	$180.00	8.04	$50.00	$50.00	$100.00	$20.00	3.31
222.22	Side Offices (3) - North Corner	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	13	0.81	2,418	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	13	0.47	1,404	0.34	1,014	$122	6	Dual Technology Occupancy Sensor - Switch Mnt.	3	20.0%	281	$34	$780.00	$780.00	$1,560.00	$260.00	10.68	$150.00	$150.00	$300.00	$20.00	8.31
222.22	Conf. Room B	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	744	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	432	0.10	312	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$10	$240.00	$240.00	$480.00	$80.00	10.68	$50.00	$50.00	$100.00	$20.00	7.72
221.21	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
221.21	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
227.221	Kitchenette	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	3	0.10	306	Existing to Remain	No Change	2	34	0	0.10	306	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	61	$7	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	FALSE	13.62
222.22	Corridor	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	3	0.19	670	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	3	0.11	389	0.08	281	$34	0	No New Controls	0	0.0%	0	$0	$180.00	$180.00	$360.00	$60.00	8.90	$0.00	$0.00	$0.00	FALSE	-
222.22	Side Offices (3) - East Corner	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	13	0.81	2,418	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	13	0.47	1,404	0.34	1,014	$122	6	Dual Technology Occupancy Sensor - Switch Mnt.	3	20.0%	281	$34	$780.00	$780.00	$1,560.00	$260.00	10.68	$150.00	$150.00	$300.00	$20.00	8.31
222.22	Open Office - South	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	25	1.55	4,650	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	25	0.90	2,700	0.65	1,950	$234	5	Dual Technology Occupancy Sensor - Remote Mnt.	3	20.0%	540	$65	$1,500.00	$1,500.00	$3,000.00	$500.00	10.68	$600.00	$150.00	$750.00	$35.00	11.03
Basement																																		
221.34	Boiler Room	4000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	8	0.50	1,984	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	8	0.29	1,152	0.21	832	$100	0	No New Controls	0	0.0%	0	$0	$480.00	$480.00	$960.00	$160.00	8.01	$0.00	$0.00	$0.00	FALSE	-
121.34	Boiler Room	4000	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mount, No Lens	2	72	1	0.07	288	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	1	0.04	144	0.04	144	$17	0	No New Controls	0	0.0%	0	$0	$60.00	$60.00	$120.00	$20.00	5.79	$0.00	$0.00	$0.00	FALSE	-
222.22	Elevator Lobby	3600	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,339	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	778	0.16	562	$67	0	No New Controls	0	0.0%	0	$0	$360.00	$360.00	$720.00	$120.00	8.90	$0.00	$0.00	$0.00	FALSE	-
227.221	Elevator Lobby	3600	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	1	0.03	122	Existing to Remain	No Change	2	34	0	0.03	122	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
Election Board																																		
222.22	Reception	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	13	0.81	2,418	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	13	0.47	1,404	0.34	1,014	$122	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	281	$34	$780.00	$780.00	$1,560.00	$260.00	10.68	$200.00	$50.00	$250.00	$35.00	6.38
222.22	Open Office	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	40	2.48	7,440	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	40	1.44	4,320	1.04	3,120	$374	5	Dual Technology Occupancy Sensor - Remote Mnt.	5	20.0%	864	$104	$2,400.00	$2,400.00	$4,800.00	$800.00	10.68	$1,000.00	$250.00	$1,250.00	$35.00	11.72
227.221	Open Office	3000	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	34	6	0.20	612	Existing to Remain	No Change	2	34	0	0.20	612	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
222.22	Assist Super Office	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	372	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	216	0.05	156	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	43	$5	$120.00	$120.00	$240.00	$40.00	10.68	$25.00	$25.00	$50.00	FALSE	9.65
222.22	Assist Super Office	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	372	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	216	0.05	156	$19	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	43	$5	$120.00	$120.00	$240.00	$40.00	10.68	$25.00	$25.00	$50.00	FALSE	9.65
222.22	Side Offices (2)	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	744	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	432	0.10	312	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	2	20.0%	86	$10	$240.00	$240.00	$480.00	$80.00	10.68	$100.00	$100.00	$200.00	$20.00	17.36
221.41	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
221.41	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	2	0.12	322	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	2	0.07	187	0.05	135	$16	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	37	$4	$120.00	$120.00	$240.00	$40.00	12.33	$50.00	$50.00	$100.00	FALSE	22.26
222.22	Kitchenette	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	744	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	432	0.10	312	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	86	$10	$240.00	$240.00	$480.00	$80.00	10.68	$50.00	$50.00	$100.00	$20.00	7.72
222.22	Conf. Room	3000	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	6	0.37	1,116	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	6	0.22	648	0.16	468	$56	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	130	$16	$360.00	$360.00	$720.00	$120.00	10.68	$50.00	$50.00	$100.00	$20.00	5.14
222.22	Storage Room IT	4400	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	10	0.62	2,728	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	10	0.36	1,584	0.26	1,144	$137	0	No New Controls	0	0.0%	0	$0	$600.00	$600.00	$1,200.00	$200.00	7.28	$0.00	$0.00	$0.00	FALSE	-
121.14	Elevator Cars (2)	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, No Lens	2	72	4	0.29	2,523	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	4	0.14	1,261	0.14	1,261	$151	0	No New Controls	0	0.0%	0	$0	$240.00	$240.00	$480.00	$80.00	2.64	$0.00	$0.00	$0.00	FALSE	-
221.41	Stairwell A	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	15	0.93	8,147	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	15	0.54	4,730	0.39	3,416	$410	0	No New Controls	0	0.0%	0	$0	$900.00	$900.00	$1,800.00	$300.00	3.66	$0.00	$0.00	$0.00	FALSE	-
221.41	Stairwell B	8760	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	13	0.81	7,061	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	13	0.47	4,100	0.34	2,961	$355	0	No New Controls	0	0.0%	0	$0	$780.00	$780.00	$1,560.00	$260.00	3.66	$0.00	$0.00	$0.00	FALSE	-
131.34	Penthouse	1800	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mount, No Lens	3	108	7	0.76	1,361	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	3	54	7	0.38	680	0.38	680	$82	0	No New Controls	0	0.0%	0	$0	$630.00	$420.00	$1,050.00	$210.00	10.29	$0.00	$0.00	$0.00	FALSE	-
Exterior																																		
720	Exterior	4400	Recessed Down Light, 175w MH	1	205	25	5.13	22,550	Bypass Ballast, Relamp	45w LED	1	45	25	1.13	4,950	4.00	17,600	$2,112	0	No New Controls	0	0.0%	0	$0	$3,750.00	$1,625.00	$5,375.00	$1,250.00	1.95	$0.00	$0.00	$0.00	FALSE	-
712	Exterior	4400	100w HPS Wall Pack	1	120	1	0.12	528	Replace Fixture	RAB 26w LED Wall Pack	1	26	1	0.03	114	0.09	414	$50	0	No New Controls	0	0.0%	0	$0	$200.00	$100.00	$300.00	$50.00	5.04	$0.00	$0.00	$0.00	FALSE	-
Parking Garage																																		
903	Exterior	8760	175w MH Area Light, Ceiling Mount	1	195	476	92.82	813,103	Replace Fixture	RAB 52w LED Garage Light; GLED52N	1	52	476	24.75	216,828	68.07	596,276	$71,553	0	No New Controls	0	0.0%	0	$0	$95,200.00	$95,200.00	$190,400.00	$23,800.00	2.33	$0.00	$0.00	$0.00	FALSE	-
904	Exterior	8760	150w HPS Area Light, Ceiling Mount	1	170	176	29.92	262,099	Replace Fixture	RAB 52w LED Garage Light; GLED52N	1	52	176	9.15	80,172	20.77	181,928	$21,831	0	No New Controls	0	0.0%	0	$0	$35,200.00	$35,200.00	$70,400.00	$8,800.00	2.82	$0.00	$0.00	$0.00	FALSE	-
905	Exterior	8760	175w MH Wall Pack	1	195	8	1.56	13,666	Replace Fixture	RAB 52w LED Wall Pack	1	52	8	0.42	3,644	1.14	10,021	$1,203	0	No New Controls	0	0.0%	0	$0	$1,600.00	$1,600.00	$3,200.00	$408.00	2.32	$0.00	$0.00	$0.00	FALSE	-
906	Exterior	8760	400w HPS "Shoebox"	1	465	10	4.65	40,734	Replace Fixture	RAB 104w LED Area Light	1	104	10	1.04	9,110	3.61	31,624	$3,795	0	No New Controls	0	0.0%	0	$0	$2,500.00	$2,000.00	$4,500.00	$500.00	1.05	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST					
	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
907	Exterior	8760	1x4, 2-Lamp, 34w T12, Mag. Ballast, White Lens	2	72	34	2.45	21,444	Bypass Ballast, Relamp	4' Alledra 18w LED; LLT-X-T8-Y-SW-120-Z-S-N	2	36	34	1.22	10,722	1.22	10,722	$1,287	0	No New Controls	0	0.0%	0	$0	$2,040.00	$2,040.00	$4,080.00	$680.00	2.64	$0.00	$0.00	$0.00	FALSE	-
908	Exterior	8760	100w HPS White Globe Area Light - Pier Mount	1	120	24	2.88	25,229	Bypass Ballast, Relamp	40w LED 360 Degree Lamp	1	40	24	0.96	8,410	1.92	16,819	$2,018	0	No New Controls	0	0.0%	0	$0	$3,600.00	$2,400.00	$6,000.00	$240.00	2.85	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					**628**	**177**	**1,326,495**					**1,301**	**61**	**409,560**	**116**	**916,935**	**$110,032**			**68**		**9,381**	**$1,126**	**$177,420**	**$172,805**	**$350,225**	**$46,898**	**2.76**	**$7,700**	**$3,400**	**$11,100**	**$655.00**	**9.28**

APPENDIX F

Location Description	Area (Sq FT)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Total KW_{AC}	Panel Weight (41.9 lbs)	W/SQFT
PEER-Parking Garage	82000	SHARP ND-240QCJ	1429	17.5	25,066	342.96	411,719	277.8	59,875	13.68

Roof Total kW_{DC} = 11.76

= Proposed PV Roof Layout

Parking Lot Total kW_{DC} = 331.2

= Proposed PV Parking Canopy Layout

= Alternative Proposed PV Parking Canopy Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.
2. Alternative Location for Parking Lot Array in Center of Garage with built up structure will yield a similar capacity.

Project Name: **LGEA Solar PV Project - PEER-Parking Garage**
Location: **Toms River, NJ**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$1,631,135
Annual kWh Production	411,719
Annual Energy Cost Reduction	$49,406
Average Annual SREC Revenue	$62,377

Simple Payback: **14.59** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.120**
Financing Rate: 6.00%
Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/kWh) $0.152

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$0	0	0	0	$0	0	0	0	0
1	$0	411,719	$49,406	$0	$102,930	$95,986	$69,187	($12,837)	($12,837)
2	$0	409,660	$50,888	$0	$102,415	$91,719	$73,455	($11,870)	($24,707)
3	$0	407,612	$52,415	$0	$101,903	$87,188	$77,985	($10,855)	($35,562)
4	$0	405,574	$53,988	$0	$81,115	$82,378	$82,795	($30,071)	($65,633)
5	$0	403,546	$55,607	$4,157	$80,709	$77,272	$87,902	($33,013)	($98,646)
6	$0	401,528	$57,275	$4,136	$80,306	$71,850	$93,323	($31,728)	($130,374)
7	$0	399,521	$58,994	$4,115	$59,928	$66,094	$99,079	($50,367)	($180,741)
8	$0	397,523	$60,763	$4,094	$59,628	$59,983	$105,190	($48,876)	($229,617)
9	$0	395,536	$62,586	$4,074	$59,330	$53,495	$111,678	($47,331)	($276,947)
10	$0	393,558	$64,464	$4,054	$39,356	$46,607	$118,566	($65,407)	($342,354)
11	$0	391,590	$66,398	$4,033	$39,159	$39,294	$125,879	($63,650)	($406,004)
12	$0	389,632	$68,390	$4,013	$38,963	$31,530	$133,643	($61,833)	($467,837)
13	$0	387,684	$70,442	$3,993	$19,384	$23,287	$141,886	($79,341)	($547,178)
14	$0	385,746	$72,555	$3,973	$19,287	$14,536	$150,637	($77,304)	($624,483)
15	$0	383,817	$74,731	$3,953	$19,191	$5,245	$159,928	($75,204)	($699,687)
	Totals:	5,964,246	$918,903	$44,596	$903,605	$846,465	$1,631,135	($699,687)	($4,142,608)

Net Present Value (NPV) **($492,575)**

OCEAN COUNTY

PROSECUTOR'S BUILDING

119 HOOPER AVENUE
TOMS RIVER, NJ 08753

FACILITY ENERGY REPORT

TABLE OF CONTENTS

I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	General Service Secondary (GS1)
Third Party Supplier:	Hess Corporation

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	General Service Large (GSL)
Third Party Supplier:	Hess Corporation

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: JCP&L
Rate: General Service Secondary (GS1)
Meter No: G28509638
Account No: 10-00-16-6704-71
Third Party Utility Provider: Hess
TPS Meter / Acct No: -

MONTH OF USE	CONSUMPTION KWH	DEMAND KW	TOTAL BILL
Jan-13	30,286	154.8	$3,529
Feb-13	33,452	81.1	$3,617
Mar-13	35,761	92.8	$3,734
Apr-13	42,499	104.6	$4,426
May-13	48,170	127.7	$5,388
Jun-13	53,630	147.5	$5,989
Jul-13	49,227	152.6	$5,660
Aug-13	47,707	167.0	$5,594
Sep-13	27,849	152.6	$3,401
Oct-13	28,073	100.2	$3,262
Nov-13	31,723	88.3	$3,650
Dec-13	27,239	107.2	$3,322
Totals	**455,616**	**167.0 Max**	**$51,571**

AVERAGE DEMAND **123.0 KW average**
AVERAGE RATE **$0.113** **$/kWh**

Figure 1
Electricity Usage Profile

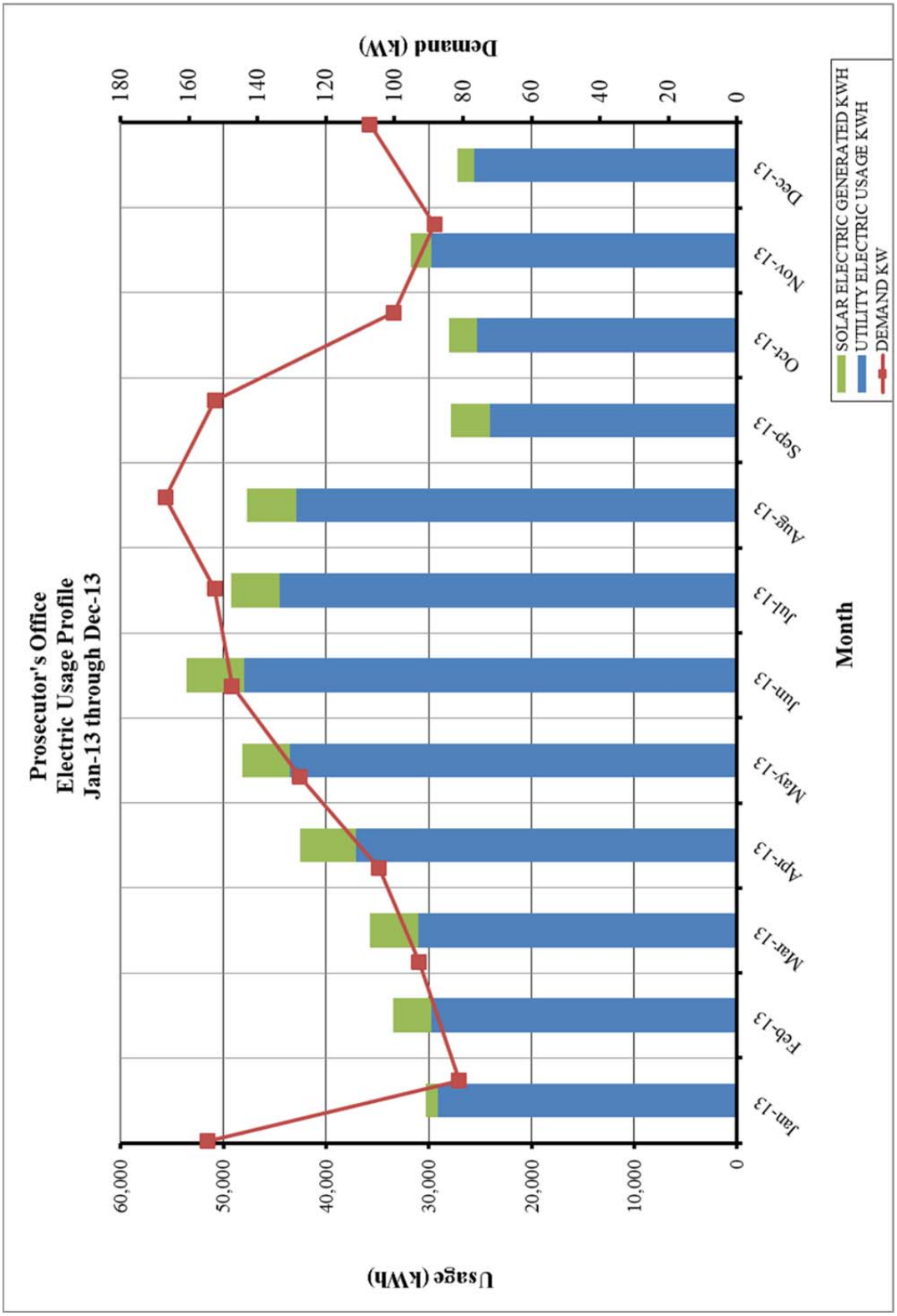
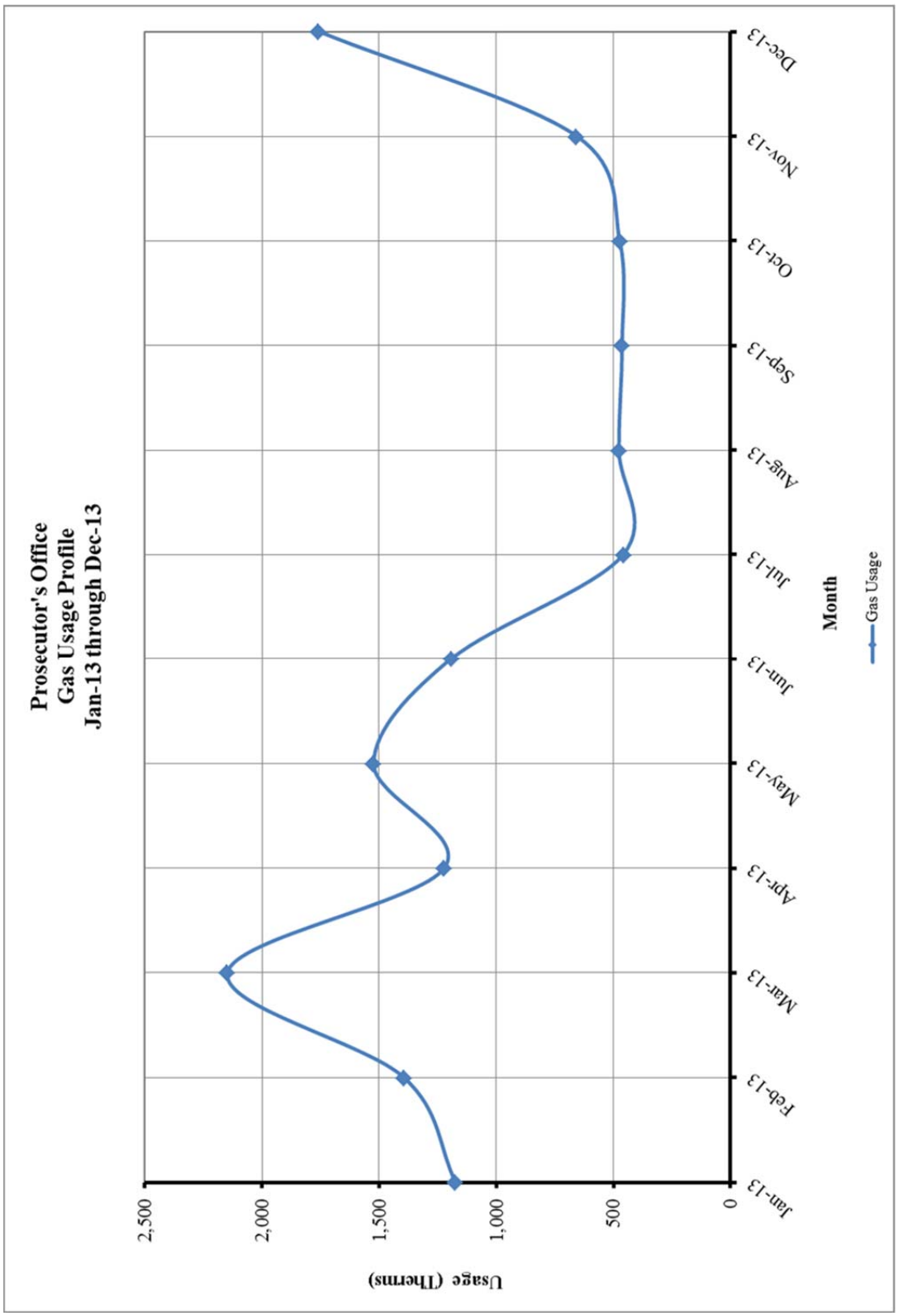


Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY		
Utility Provider: New Jersey Natural Gas		
Rate:		
Meter No: 00546152		
Account No: 19-4510-7091-14		
Third Party Utility Provider: Hess		
TPS Meter No: -		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Jan-13	1,174.06	$1,394.21
Feb-13	1,395.22	$1,606.13
Mar-13	2,147.53	$2,358.38
Apr-13	1,221.47	$1,517.86
May-13	1,523.68	$1,869.31
Jun-13	1,192.40	$1,534.94
Jul-13	458.38	$744.86
Aug-13	476.94	$749.44
Sep-13	462.89	$736.82
Oct-13	473.11	$744.48
Nov-13	657.57	$870.01
Dec-13	1,759.17	$2,076.64
TOTALS	**12,942.42**	**$16,203.08**
AVERAGE RATE:	**$1.25**	**$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

The Ocean County Prosecutor's Office is located at 119 Hooper Avenue in Toms River, New Jersey. This 32,200 SF facility was built in 1959 with major HVAC upgrades in 1994-1995. The building is a three-story facility comprised of offices and open office space, conference rooms, file storage, data center and mechanical HVAC spaces.

Occupancy Profile

The typical hours of operation for most of the facility are Monday through Friday between 8:00 am and 5:00 pm. However, areas of the building are open later when prosecutors are working on case presentation including some weekends. There are approximately 82 employees that normally occupy the facility.

Building Envelope

Exterior walls for the building are masonry brick faced with a concrete block construction. The windows throughout the facility are in very good condition. Typical windows are double pane, 1/4" with aluminum frames. The roof consists of a rubber membrane over a concrete slab.

HVAC Systems

The Prosecutor's Office is heated by HydroTherm Model MR 1800B modular boilers consisting of six (6) modules rated at a total of 1,800 MBH input and 1,440 MBH output when new for an efficiency of 80%. Based on the age and condition of the modules, Concord Engineering estimates that the thermal efficiency is approximately 70%. Heating hot water is circulated to various hot water coils and fin-tube radiators via two (2) Taco base-mounted, end suction pumps with 5-HP motors rated at 115 GPM @ 65' TDH. Most areas are heated by VAV boxes with hot water coils and most of the perimeter walls are heated by hot water baseboard heaters. The vestibules & entrances are heated with hot water cabinet unit heaters while the mechanical rooms, restrooms, storage, etc. have hot water unit heaters. The electrical rooms have electric unit heaters.

Cooling for the facility is provided by a Trane IntelliPak Model SXHFC60E packaged rooftop unit with DX cooling, rated at a nominal 60-Tons and an efficiency of 9.5 EER and two (2) Trane Model TCD090D rooftop units rated at 7.5-Tons with an efficiency of 9.0 EER. These units include economizers for free cooling and inlet guide vanes. These three rooftop units are 20 years old and are past the ASHRAE service life of 15 years.

In addition, there are three (3) Trane Model TTA060C split, air-cooled, condensing units on the roof rated at 5-Tons that are 20 years old and at the end of their service life of 20 years. These units have an existing SEER of 10.7 while a high-efficiency replacement has a SEER=14.0.

The small data center is cooled by a Liebert Model MME018E air conditioning unit with reheat, humidifier, DX coil and microprocessor control system. The rooftop condensing unit is a Liebert Model DMC020A with a 2-HP condenser fan.

Supply/Exhaust Fan System

A ¼-HP supply fan supplies combustion air for the heating hot water modular boilers. There are various exhaust fans on the roof which ventilate mechanical rooms, elevator machine room, and restrooms.

HVAC System Controls

The heating and cooling is controlled by various thermostats throughout the facility. The Hydro-Therm modular boilers are sequenced and controlled by a Hydro-Therm boiler control panel that includes outside air temperature reset. The Trane packaged rooftop units contain standalone thermostat controls within each space they condition. The cabinet and unit heaters have wall-mounted thermostats.

Domestic Hot Water

The domestic hot water for this facility is produced by an A. O. Smith Model BTC 120 gas-fired storage water heater with an input of 120 MBH, a 75-gallon capacity tank, a recovery of 109.1 GPH @ 100°F rise, and a thermal efficiency of 80% when new.

Lighting

Refer to the Investment Grade lighting Audit Appendix for a detailed list of the lighting throughout the facility and estimated operating hours per space.

Solar System

The roof of the Prosecutors Building has a 44 kilowatt Direct Current (DC) rated solar array. The array is connected to a Deck Monitoring System with online access to current system and historical system statistics. This monitoring system is also connected to a kiosk located in the building.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade - General	$86,350	$7,276	11.9	26.4%
ECM #2	Lighting Upgrade - Exterior	$4,900	$958	5.1	193.3%
ECM #3	Lighting Controls Upgrade	$8,600	$1,637	5.3	185.5%
ECM #4	Boiler Upgrade	$125,047	$2,853	43.8	-43.0%
ECM #5	Domestic Hot Water Heater Upgrade	$17,760	$155	114.6	-89.5%
ECM #6	NEMA Premium Motors for Hot Water Pumps	$2,784	$191	14.6	23.5%
ECM #7	Split System Replacement	$25,620	$2,377	10.8	39.2%
ECM #8	Rooftop Unit Replacement	$31,404	$564	55.7	-73.1%
ECM #9	60 Ton Rooftop Unit Replacement	$82,100	$1,486	55.2	-72.9%
ECM #10	Vending Miser Controls	$300	$320	0.9	966.7%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Lighting Upgrade - General	15.5	55,968	0
ECM #2	Lighting Upgrade - Exterior	1.7	7,366	0
ECM #3	Lighting Controls Upgrade	0.0	12,596	0
ECM #4	Boiler Upgrade	0.0	0	2,941
ECM #5	Domestic Hot Water Heater Upgrade	0.0	0	124
ECM #6	NEMA Premium Motors for Hot Water Pumps	0.6	1,693	0
ECM #7	Split System Replacement	17.5	21,039	0
ECM #8	Rooftop Unit Replacement	2.1	4,987	0
ECM #9	60 Ton Rooftop Unit Replacement	7.3	13,149	0
ECM #10	Vending Miser Controls	0.0	2,560	0

Table 3
ECM Emissions Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	**DESCRIPTION**	**GREENHOUSE GAS EMISSIONS REDUCTION**		
		CO_2 EMISSIONS (LBS)	**NO_X EMISSIONS (LBS)**	**SO_2 EMISSIONS (LBS)**
ECM #1	Lighting Upgrade - General	85,071	157	364
ECM #2	Lighting Upgrade - Exterior	11,196	21	48
ECM #3	Lighting Controls Upgrade	19,145	35	82
ECM #4	Boiler Upgrade	34,410	27	0
ECM #5	Domestic Hot Water Heater Upgrade	1,451	1	0
ECM #6	NEMA Premium Motors for Hot Water Pumps	2,573	5	11
ECM #7	Split System Replacement	31,979	59	137
ECM #8	Rooftop Unit Replacement	7,580	14	32
ECM #9	60 Ton Rooftop Unit Replacement	19,986	37	85
ECM #10	Vending Miser Controls	3,891	7	17
Notes:	A. Emissions Reduction based on NJCEP published factors for electric & gas.			

Table 4
Facility Project Summary

FACILITY PROJECT SUMMARY TABLE					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade - General	$7,276	$105,000	$18,650	$86,350	11.9
Lighting Upgrade - Exterior	$958	$5,000	$100	$4,900	5.1
Lighting Controls Upgrade	$1,637	$10,000	$1,400	$8,600	5.3
Boiler Upgrade	$2,853	$128,547	$3,500	$125,047	43.8
Domestic Hot Water Heater Upgrade	$155	$18,000	$240	$17,760	114.6
NEMA Premium Motors for Hot Water Pumps	$191	$2,784	$0	$2,784	14.6
Split System Replacement	$2,377	$27,000	$1,380	$25,620	10.8
Rooftop Unit Replacement	$564	$32,500	$1,096	$31,404	55.7
60 Ton Rooftop Unit Replacement	$1,486	$84,500	$2,400	$82,100	55.2
Vending Miser Controls	$320	$300	$0	$300	0.9
Total Project	**$17,817**	**$413,631**	**$28,766**	**$384,865**	**21.6**

Note the measure totals in this table do not take into account interactive effects of measures; see Method of Analysis Section III in Executive Report for further explanation.

The facility peak electrical demand and total project savings meet the qualifications for the Pay for Performance Program. If the owner were to pursue this program option they would receive an estimated $34398.1664 in incentive dollars, see the Installation Funding Options Section for more detail.

ECM #1: Lighting Upgrade – Interior

Description:

The majority of the interior lighting throughout Prosecutors Building is provided with fluorescent fixtures with older generation, 32W T8 lamps and electronic ballasts. Although these T8 lamps are considered fairly efficient, further energy savings can be achieved by replacing the existing T8 lamps with new LED style fixtures. In addition to the fluorescent tube lamps there are additional fixture types consisting of metal halide lamps and incandescent lamps. These too can be retrofitted to LED style lamps.

This ECM includes retrofitting the interior lighting with new LED type fixtures, screw in lamps, and exterior lights. It is recommended the County consult with a professional engineer prior to retrofitting fixtures to ensure code required minimum light levels will be met. Additional savings may also be able to be found if it is discovered fixture quantities can be reduced.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	15.5
Electric Usage Savings (kWh)	55,968
Electric Cost Savings ($)	$7,276

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$105,000
NJ Smart Start Equipment Incentive ($):	$18,650
Net Installation Cost ($):	$86,350
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$7,276
Total Yearly Savings ($/Yr):	$7,276
Estimated ECM Lifetime (Yr):	15
Simple Payback	11.9
Simple Lifetime ROI	26.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$109,140
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	$510.42

ECM #2: Lighting Upgrade – Exterior Lighting

Description:

The exterior lighting at Prosecutor's Building is currently lit by high pressure sodium fixtures. The exterior would be better served with more efficient LED lighting system. Concord Engineering recommends upgrading the lighting to an energy-efficient LED lighting system that includes LED lamps and fixtures for the existing exterior lighting.

This ECM would replace the existing exterior lamps and fixtures with equivalent LED lamps and fixtures.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in **Investment Grade Lighting Audit Appendix** that outlines the proposed retrofits, costs, savings, and payback periods.

LIGHTING UPGRADE SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	1.7
Electric Usage Savings (kWh)	7,366
Electric Cost Savings ($)	$958

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$5,000
NJ Smart Start Equipment Incentive ($):	$100
Net Installation Cost ($):	$4,900
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$958
Total Yearly Savings ($/Yr):	$958
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.1
Simple Lifetime ROI	193.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$14,370
Internal Rate of Return (IRR)	18%
Net Present Value (NPV)	$6,536.54

ECM #3: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the Prosecutor's Building are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors.

This ECM includes installation of ceiling or switch mount sensors for mostly offices and restrooms. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = \left(\%\ \text{Savings} \times \text{Controlled Light Energy}\ \left(\text{kWh/Yr}\right)\right)$$

$$\text{Savings.} = \text{Energy Savings}\left(\text{kWh}\right) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

LIGHTING CONTROLS SAVINGS SUMMARY	
DESCRIPTION	**SAVINGS**
Electric Demand Savings (kW)	0.0
Electric Usage Savings (kWh)	12,596
Electric Cost Savings ($)	$1,637

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
= (# Wall mount sensors × $20 per sensor)
+ (# Ceiling mount sensors × $35 per sensor)

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$10,000
NJ Smart Start Equipment Incentive ($):	$1,400
Net Installation Cost ($):	$8,600
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,637
Total Yearly Savings ($/Yr):	$1,637
Estimated ECM Lifetime (Yr):	15
Simple Payback	5.3
Simple Lifetime ROI	185.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$24,555
Internal Rate of Return (IRR)	17%
Net Present Value (NPV)	$10,942.40

ECM # 4: Boiler Replacement

Description:

The Prosecutor's Office is heated by a central hot water boiler plant located in the boiler room. Hot water is provided by a HydroTherm Model MR 1800B system of gas-fired modular boilers rated for an input capacity of 1,800 MBH and a rated output capacity of 1,440 MBH when new. The hot water heating system is comprised of six (6) modular boilers connected together with inputs of 300 MBH each. The boilers were manufactured in 1996 and are approaching their service life along with using more gas than a high-efficiency modular unit.

CEG recommends replacing these boilers with two (2) 1,000 MBH high-efficiency condensing hot water boilers. Condensing boilers can substantially improve the operating efficiency of the heating system of the building. A condensing boiler's peak efficiency tops out at 98% depending on return water temperature. The natural gas to water efficiency for the new boilers with digital burner controls is approximately 92% over its operating range and with the advanced controls and a 5:1 turn down ratio.

This energy conservation measure will replace the existing HydroTherm gas-fired, modular boilers serving the facility with high-efficiency, modular, condensing heating hot water boilers. Calculation is based on the following equipment: Aerco Benchmark 1000, modular, condensing hot water boiler or equivalent.

Energy Savings Calculations:

Gas consumption of the boiler plant is gathered in order to calculate the estimated heat output of the existing boilers. It is confirmed that the boiler is for space heating only and does not provide domestic hot water heating.

The annual gas consumption is used in a reverse calculation in the below equations to obtain proposed annual gas consumption based on improved efficiency. Calculations are summarized in the table below.

$$\text{Annual Output, MMBTU} = \frac{\text{Consumption (Therms)} \times 100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ Current Boiler Effc}}{1{,}000{,}000}$$

$$\text{Proposed Gas Consumption, Therms} = \frac{\text{Annual Output (MMBTU)} \times 1{,}000{,}000}{100{,}000 \frac{\text{BTU}}{\text{Therm}} \times \text{ New Boiler Efficiency}}$$

HIGH EFFICIENCY BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Cast Iron Boilers	New High Efficiency Boilers	
Existing Nat Gas (Therms)	12,298		
Boiler Efficiency (%)	70.0%	92.0%	22%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	
Equivalent Building Heat Usage (MMBTUs)	861	861	
Gas Cost ($/Therm)	$0.97	$0.97	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	12,298	9,357	2,941
Energy Cost ($)	$11,929	$9,077	$2,853
COMMENTS:	Boiler Efficiency Based on age of boiler, and average of both boilers		

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$128,547
NJ Smart Start Equipment Incentive ($):	$3,500
Net Installation Cost ($):	$125,047
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,853
Total Yearly Savings ($/Yr):	$2,853
Estimated ECM Lifetime (Yr):	25
Simple Payback	43.8
Simple Lifetime ROI	-43.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$71,325
Internal Rate of Return (IRR)	-4%
Net Present Value (NPV)	($75,366.89)

ECM #5: Domestic Hot Water Heater Upgrade

Description:

Domestic hot water for the Prosecutor's Building is provided by a single A.O. Smith Model BTC 120 920, 75-gallon, gas-fired hot water heater rated at 120 MBH. This unit has a rated thermal efficiency of only 80% and a recovery of 109 gallons per hour.

This ECM would replace this existing gas-fired, domestic water heater with a Bradford White Model EF-60T-125E with a 96% thermal efficiency. The new unit is rated at 125 MBH, has a 60-gallon storage tank, and a rated recovery of 145 gallons per hour.

Energy Savings Calculations:

DOM. HOT WATER HEATER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Electric Water Heater	High Efficiency Heater	
Building Type	Office		
Building Square-foot	32,205	32,205	
Domestic Water Usage, kBtu	51,528.00	51,528.00	
DHW Heating Fuel Type	Gas	Gas	
Heating Efficiency	78%	96%	18%
Total Usage (kBTU)	66,062	53,675	12,387
Nat Gas Cost ($/Therm)	$ 1.250	$ 1.250	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	661	537	124
Energy Cost ($)	$826	$671	$155
COMMENTS:	Savings are based on Energy Information Administration Commercial Building Energy Consumption Survey 2003 Information		

Energy Density for "Office" type building = 1.6 kBtu / SF / year

$$DHW\ \ Heat\ Usage = Energy\ Density\left(\frac{kBtu\ yr}{SF}\right)\times Building\ Square\ Footage\ \ (SF)$$

$$DHW\ Total\ Usage = \frac{Dom\ HW\ \ Heat\ Cons.(Btu)}{Heating\ \ Eff.(\%)\times Fuel\ \ Heat\ Value\left(\frac{BTU}{Fuel\ Unit}\right)}$$

$$Energy\ Cost = Heating\ \ Fuel\ Usage(Fuel\ Units)\times Ave\ Fuel\ Cost\left(\frac{\$}{Fuel\ Unit}\right)$$

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$18,000
NJ Smart Start Equipment Incentive ($):	$240
Net Installation Cost ($):	$17,760
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$155
Total Yearly Savings ($/Yr):	$155
Estimated ECM Lifetime (Yr):	12
Simple Payback	114.6
Simple Lifetime ROI	-89.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$1,860
Internal Rate of Return (IRR)	-24%
Net Present Value (NPV)	($16,217.13)

ECM #6: Install NEMA Premium® Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving two hot water pumps (P-1 and P-2) are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors. NEMA Premium® is the most efficient motor designation in the marketplace today. (Note: There are currently no NJ OCE incentives for premium efficiency motors.)

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
P-1	Heating Hot Water Pump	5	2,745	81.5%	89.5%
P-2	Heating Hot Water Pump	5	2,745	81.5%	89.5%

Energy Savings Calculations:

$$\text{Electric usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate} \left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS								
EQMT ID	QTY	MOTOR HP	LOAD FACTOR	EXISTING EFFICIENCY	PROPOSED EFFICIENCY	POWER SAVINGS kW	ENERGY SAVINGS kWH	COST SAVINGS
P-1	1	5	75%	81.5%	89.5%	0.31	847	$96
P-2	1	5	75%	81.5%	89.5%	0.31	847	$96
TOTAL						**0.6**	**1,693**	**$191**

Equipment Cost

The following table outlines the summary of motor replacement costs:

MOTOR REPLACEMENT SUMMARY						
EQMT ID	MOTOR POWER HP	INSTALLED COST	SMART START INCENTIVE	NET COST	TOTAL SAVINGS	SIMPLE PAYBACK
P-1	5	$1,392	$0	$1,392	$96	14.5
P-2	5	$1,392	$0	$1,392	$96	14.5
TOTAL		**$2,784**	**$0**	**$2,784**	**$191**	**14.5**

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,784
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$2,784
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$191
Total Yearly Savings ($/Yr):	$191
Estimated ECM Lifetime (Yr):	18
Simple Payback	14.6
Simple Lifetime ROI	23.5%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$3,438
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($157.08)

ECM #7: Split System Replacements

Description:

The Prosecutor's Office has three (3) Trane Model TTA060 split system air conditioning only units which serves some of the interior spaces. The estimated existing unit efficiencies are 11 SEER. These 5-Ton split units have surpassed their ASHRAE service life expectancy of 15 years. Replacing these units with newer more efficient units would result in significant energy savings.

The units currently installed have lower efficiencies compared to modern high-efficiency units. New units provide higher full load and part load efficiencies due to advances in inverter motor technologies, higher efficiency refrigerants such as R410A which would be used in place of R22 that is currently used in these units.

This ECM includes replacement of the older split system units with new higher efficiency split systems as well as new evaporator coils for the indoor units. It is recommended to fully evaluate the capacity needed for the new split system units prior to moving forward with this ECM. A summary of the unit replacements for this ECM can be found in the table below:

IMPLEMENTATION SUMMARY					
ECM INPUTS	**SERVICE FOR**	**NUMBER OF UNITS**	**COOLING CAPACITY, BTU/HR**	**TOTAL CAPACITY, TONS**	**REPLACE UNIT WITH**
SS	Split System	5	60,000	5.0	Trane 4TTB & Evap Coil
SS	Split System	5	60,000	5.0	Trane 4TTB & Evap Coil
SS	Split System	5	60,000	5.0	Trane 4TTB & Evap Coil
Total		**15**	**180,000**	**15.0**	

The high-efficiency rooftop used as the basis for the calculation is a Trane Model 4TTB. The unit pricing and install cost were estimated based on current rates quotes and labor rates. The payback may change based on actual unit pricing and installed costs if the ECM is implemented.

Energy Savings Calculations:

Cooling Energy Savings:

Seasonal energy consumption of the air conditioners at the cooling mode is calculated with the equation below:

$$\text{Energy Savings, kWh} = \text{Cooling Capacity,} \frac{\text{BTU}}{\text{Hr}} \times \left(\frac{1}{\text{SEER}_{\text{Old}}} - \frac{1}{\text{SEER}_{\text{New}}} \right) \times \frac{\text{Operation Hours}}{1000 \frac{\text{W}}{\text{kWh}}}$$

$$\text{Demand Savings, kW} = \frac{\text{Energy Savings (kWh)}}{\text{Hours of Cooling}}$$

$$\text{Cooling Cost Savings} = \text{Energy Savings, kWh} \times \text{Cost of Electricity}\left(\frac{\$}{\text{kWh}}\right)$$

ENERGY SAVINGS CALCULATIONS							
ECM INPUTS	**EXISTING COOLING CAPACITY, BTU/Hr**	**ANNUAL COOLING HOURS**	**EXISTING UNIT SEER**	**NEW UNIT SEER**	**# OF UNITS**	**ENERGY SAVINGS kWh**	**DEMAND SAVINGS kW**
SS	60,000	1,200	10.7	14	5	7,013	5.8
SS	60,000	1,200	10.7	14	5	7,013	5.8
SS	60,000	1,200	10.7	14	5	7,013	5.8
Total					15	21,039	17.5

Project Cost, Incentives and Maintenance Savings

From the NJ Smart Start® Program appendix, the replacement of split system AC units and unitary systems with high efficiency AC systems falls under the category "Unitary HVAC Split System" and warrants an incentive based on efficiency (EER/SEER). The program incentives are calculated as follows:

$$\text{SmartStart® Incentive} = (\text{Cooling Tons} \times \$/\text{Ton Incentive})$$

AC UNITS REBATE SUMMARY				
UNIT DESCRIPTION	**UNIT EFFICIENCY**	**REBATE $/TON**	**PROPOSED CAPACITY TONS**	**TOTAL REBATE $**
5.4 tons or less Unitary AC and Split System	≥14 SEER	$92	15.0	$1,380
TOTAL			**15**	**$1,380**

Summary of cost, savings and payback for this ECM is below.

COST & SAVINGS SUMMARY							
ECM INPUTS	**INSTALLED COST**	**# OF UNITS**	**TOTAL COST**	**REBATES**	**NET COST**	**ENERGY SAVINGS**	**PAY BACK YEARS**
SS	$9,000	5	$9,000	$460	$8,540	$792	10.8
SS	$9,000	5	$9,000	$460	$8,540	$792	10.8
SS	$9,000	5	$9,000	$460	$8,540	$792	10.8
Total	$27,000	15	$27,000	$1,380	$25,620	$2,377	10.8

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$27,000
NJ Smart Start Equipment Incentive ($):	$1,380
Net Installation Cost ($):	$25,620
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,377
Total Yearly Savings ($/Yr):	$2,377
Estimated ECM Lifetime (Yr):	15
Simple Payback	10.8
Simple Lifetime ROI	39.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$35,655
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$2,756.47

ECM #8: Rooftop Unit Replacements

Description:

The Prosecutor's Office has two (2) Trane Model TCD 090 packaged rooftop air conditioning only units which serve a majority of the second and third floors. The estimated existing unit efficiency is 11 EER. These 7.5-Ton split units have surpassed their ASHRAE service life expectancy of 15 years. Replacing these units with newer more efficient units would result in significant energy savings.

The units currently installed have lower efficiencies compared to modern high-efficiency units. New units provide higher full load and part load efficiencies due to advances in inverter motor technologies, higher efficiency refrigerants such as R410A which would be used in place of R22 that is currently used in the unit.

This ECM includes replacement of the older rooftop units with new higher efficiency rooftops. It is recommended to fully evaluate the capacity needed for the new rooftop units prior to moving forward with this ECM. A summary of the unit replacement for this ECM can be found in the table below:

IMPLEMENTATION SUMMARY					
ECM INPUTS	**SERVICE FOR**	**NUMBER OF UNITS**	**COOLING CAPACITY, BTU/HR**	**TOTAL CAPACITY, TONS**	**REPLACE UNIT WITH**
RTU	Packaged Rooftop	1	90,000	7.5	Trane THC090
RTU	Packaged Rooftop	1	90,000	7.5	Trane THC090
Total		**2**	**180,000**	**15.0**	

The high-efficiency rooftop used as the basis for the calculation is a Trane Model THC 090 with an EER=12.6. The unit pricing and install cost were estimated based on current rates quotes and labor rates. The payback may change based on actual unit pricing and installed costs if the ECM is implemented.

Energy Savings Calculations:

Cooling Energy Savings:

Seasonal energy consumption of the air conditioners at the cooling mode is calculated with the equation below:

$$\text{Energy Savings, kWh} = \text{Cooling Capacity,} \frac{\text{BTU}}{\text{Hr}} \times \left(\frac{1}{\text{SEER}_{\text{Old}}} - \frac{1}{\text{SEER}_{\text{New}}} \right) \times \frac{\text{Operation Hours}}{1000 \frac{\text{W}}{\text{kWh}}}$$

$$\text{Demand Savings, kW} = \frac{\text{Energy Savings (kWh)}}{\text{Hours of Cooling}}$$

$$\text{Cooling Cost Savings} = \text{Energy Savings, kWh} \times \text{Cost of Electricity}\left(\frac{\$}{\text{kWh}}\right)$$

ENERGY SAVINGS CALCULATIONS							
ECM INPUTS	**EXISTING COOLING CAPACITY, BTU/Hr**	**ANNUAL COOLING HOURS**	**EXISTING UNIT EER**	**NEW UNIT EER**	**# OF UNITS**	**ENERGY SAVINGS kWh**	**DEMAND SAVINGS kW**
RTU	90,000	2,400	11	12.6	1	2,494	1.0
RTU	90,000	2,400	11	12.6	1	2,494	1.0
Total					2	4,987	2.1

Project Cost, Incentives and Maintenance Savings

From the NJ Smart Start® Program appendix, the replacement of split system AC units and unitary systems with high efficiency AC systems falls under the category "Unitary HVAC Split System" and warrants an incentive based on efficiency (EER/SEER). The program incentives are calculated as follows:

$$\text{SmartStart® Incentive} = (\text{Cooling Tons} \times \$/\text{Ton Incentive})$$

AC UNITS REBATE SUMMARY				
UNIT DESCRIPTION	**UNIT EFFICIENCY**	**REBATE $/TON**	**PROPOSED CAPACITY TONS**	**TOTAL REBATE $**
≥ 5.4 to < 11.25 tons	11.5 EER	73	15.0	$1,095
TOTAL			**15**	**$1,095**

Summary of cost, savings and payback for this ECM is below.

COST & SAVINGS SUMMARY							
ECM INPUTS	**INSTALLED COST**	**# OF UNITS**	**TOTAL COST**	**REBATES**	**NET COST**	**ENERGY SAVINGS**	**PAY BACK YEARS**
RTU	$16,250	1	$16,250	$548	$15,702	$282	55.7
RTU	$16,250	1	$16,250	$548	$15,702	$282	55.7
Total	$32,500	2	$32,500	$1,096	$31,404	$564	55.7

Energy Savings Summary:

ECM #8 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$32,500
NJ Smart Start Equipment Incentive ($):	$1,096
Net Installation Cost ($):	$31,404
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$564
Total Yearly Savings ($/Yr):	$564
Estimated ECM Lifetime (Yr):	15
Simple Payback	55.7
Simple Lifetime ROI	-73.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$8,460
Internal Rate of Return (IRR)	-13%
Net Present Value (NPV)	($24,671.00)

ECM #9: Replace 60-Ton Rooftop Unit

Description:

Cooling for the basement and first floor of the facility is provided by a Trane IntelliPak Model SXHFC60E packaged rooftop unit with DX cooling, rated at a nominal 60-Tons and an efficiency of 9.5 EER which can be de-rated to 8.3 EER based on age and condition.

This ECM would replace the existing 60-Ton unit with an energy-efficient Trane Model Intellipak packaged rooftop unit with DX cooling and an efficiency of 9.5 EER.

Energy Savings Calculations:

ROOFTOP UNIT REPLACEMENT			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Quantity of Units	1	1	
Unit Cooling Capacity (Btu/h)	720,000	720,000	
COOLING SAVINGS CALCULATION			
Cooling Efficiency (EER)	8.3	9.5	
Cooling Equivalent Full Load Hours	1,200	1,200	
Electric Usage (kWh)	104,096	90,947	13,149
Electric Cost ($/kWh)	$0.1130	$0.1130	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Demand (kW)	58.1	50.8	7.3
Electric Usage (kWh)	104,096	90,947	13,149
Energy Cost ($)	$11,763	$10,277	$1,486
COMMENTS:	Trane Intellipak		

Energy Savings Summary:

ECM #9 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$84,500
NJ Smart Start Equipment Incentive ($):	$2,400
Net Installation Cost ($):	$82,100
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,486
Total Yearly Savings ($/Yr):	$1,486
Estimated ECM Lifetime (Yr):	15
Simple Payback	55.2
Simple Lifetime ROI	-72.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$22,290
Internal Rate of Return (IRR)	-13%
Net Present Value (NPV)	($64,360.23)

ECM #10: Vending Miser Controls

Description:

The Ocean County Prosecutor's Office currently utilizes vending machines in select areas within the building. The installation of the Vending Miser system will help reduce the operating hours of vending machines.

Cold beverage machines regularly operate inefficiently trying to maintain a constant cool temperature within the machine and snack machines with no cooling usually have lights that operate 24/7. The VendingMiser® system incorporates innovative energy-saving technology into a small plug-and-play device that in conjunction with a passive infrared sensor regulate the operation of the cold beverage and snack machines based on occupancy and room temperature. This ECM approximates the installation of one (1) for the cold beverage machine and one (1) for the snack machine.

Energy Savings Calculations:

Cold Drink and Snack Vending Machine Energy Conservation Project

	Input Variables	
Energy Analysis Prepared For:	Energy Costs ($0.000 per kwh)	$0.125
	Facility Occupied Hours per Week	60
Prosecutor's Office	Number of Cold Drink Vending Machines	1
	Number of Uncooled Snack Machines	1
www.VendingMiserStore.com	Power Requirements of Cold Drink Machine (avg watts	427
	Power Requirements of Snack Machine (avg watts)	100
	VendingMiser Sale Price (for cold drink machines)	$200.00
	OfficeMiser Sale Price (for snack machines)	$100.00

Savings Analysis

	Before	After	
Cold Drink Machines	$467.89	$218.09	Cost of Operation
	3,743	1,745	kWh
		53%	% Energy Savings
Snack Machines	$109.20	$39.00	Cost of Operation
	874	312	kWh
		64%	% Energy Savings

Project Summary

Present kWh	Projected kWh	kWh Savings per Year
4,617	2,057	2,560

Present Cost	Projected Costs	Annual Savings	Per Cent Savings	Total Project Cost	Break Even (Months)
$577.09	$257.09	$320.00	55%	$300.00	11.3

Energy Savings Summary:

ECM #10 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$300
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$300
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$320
Total Yearly Savings ($/Yr):	$320
Estimated ECM Lifetime (Yr):	10
Simple Payback	0.9
Simple Lifetime ROI	966.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$3,200
Internal Rate of Return (IRR)	107%
Net Present Value (NPV)	$2,429.66

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures. While facility staff may already perform some of these items, they are stated to remind the owner of the energy savings benefit of continual performance. These measures are typically not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode.

F. Replace any old CRT Monitors with LED/LCD Type Monitors, which can draw as much as a quarter the power of an equivalent CRT monitor.

G. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Ocean County - Prosecutor's Office

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade - General	$78,000	$27,000	$18,650	$86,350	$7,276	$0	$7,276	15	$109,140	$0	26.4%	11.9	3.08%	$510.42
ECM #2	Lighting Upgrade - Exterior	$3,000	$2,000	$100	$4,900	$958	$0	$958	15	$14,370	$0	193.3%	5.1	17.90%	$6,536.54
ECM #3	Lighting Controls Upgrade	$6,000	$4,000	$1,400	$8,600	$1,637	$0	$1,637	15	$24,555	$0	185.5%	5.3	17.30%	$10,942.40
ECM #4	Boiler Upgrade	$61,521	$67,026	$3,500	$125,047	$2,853	$0	$2,853	25	$71,325	$0	-43.0%	43.8	-3.92%	($75,366.89)
ECM #5	Domestic Hot Water Heater Upgrade	$12,000	$6,000	$240	$17,760	$155	$0	$155	12	$1,860	$0	-89.5%	114.6	-24.48%	($16,217.13)
ECM #6	NEMA Premium Motors for Hot Water Pumps	$1,644	$1,140	$0	$2,784	$191	$0	$191	18	$3,438	$0	23.5%	14.6	2.32%	($157.08)
ECM #7	Split System Replacement	$15,000	$12,000	$1,380	$25,620	$2,377	$0	$2,377	15	$35,655	$0	39.2%	10.8	4.45%	$2,756.47
ECM #8	Rooftop Unit Replacement	$22,500	$10,000	$1,096	$31,404	$564	$0	$564	15	$8,460	$0	-73.1%	55.7	-13.19%	($24,671.00)
ECM #9	60 Ton Rooftop Unit Replacement	$43,000	$41,500	$2,400	$82,100	$1,486	$0	$1,486	15	$22,290	$0	-72.9%	55.2	-13.12%	($64,360.23)
ECM #10	Vending Miser Controls	$300	$0	$0	$300	$320	$0	$320	10	$3,200	$0	966.7%	0.9	106.59%	$2,429.66

Notes:
1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives from July 1, 2013 to June 30, 2014:

Electric Chillers

Water-Cooled Chillers	$16 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Cooling

Gas Absorption Chillers	$185 - $450 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $92 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat
A/C Economizing Controls	≤ 5 tons $85/unit; >5 tons $170/unit

Energy Efficiency must comply with ASHRAE 90.1-2007

Gas Heating

Gas Fired Boilers < 300 MBH	$2.00 per MBH, but not less than $300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$400 per unit, AFUE ≥ 95%
Boiler Economizing Controls	$1,200 - $2,700
Low Intensity Infrared Heating	$300 - $500 per unit

Ground Source Heat Pumps

Closed Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2007

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps ≥ 20 hp	$60 per VFD rated hp
Rotary Screw Air Compressors ≥ 25 hp	$5,250 to $12,500 per drive
Cooling Towers ≥ 10 hp	$60 per VFD rated hp
Boiler Fans ≥ 5 HP	$65 to $155 per hp
Boiler Feed Water Pumps ≥ 5 HP	$60 to $155 per hp
Commercial Kitchen Hood up to 50 HP	Retrofit $55 – $300 per hp New Hood $55 - $250 per hp

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons, 0.67 energy factor or better	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
For retrofit of T-8 fixtures by permanent de-lamping & new reflectors (Electronic ballast replacement required)	$15 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $200 per fixture
Metal Halide w/Pulse Start Including Parking Lot (For fixtures ≥ 150w)	$25 per fixture
HID ≥ 100w Replace with new induction fixture. (must be 30% less watts/fixture than HID system)	$70 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture

Prescriptive Lighting - LED

LED Display Case Lighting	$30 per display case
LED Shelf-Mtd. Display & Task Lights	$15 per linear foot
LED Portable Desk Lamp	$20 per fixture
LED Wall-wash Lights	$30 per fixture
LED Recessed Down Lights	$35 per fixture
LED Outdoor Pole/Arm-Mounted Area and Roadway Luminaries	$175 per fixture
LED Outdoor Pole/Arm-Mounted Decorative Luminaries	$175 per fixture
LED Outdoor Wall-Mounted Area Luminaries	$100 per fixture
LED Parking Garage Luminaries	$100 per fixture
LED Track or Mono-Point Directional Lighting Fixtures	$50 per fixture
LED High-Bay and Low-Bay Fixtures for Commercial & Industrial Bldgs.	$150 per fixture
LED High-Bay-Aisle Lighting	$150 per fixture
LED Stairwell and Passageway Luminaires	$40 per fixture
LED Bollard Fixtures	$50 per fixture
Luminaires for Ambient Lighting of Interior Commercial Spaces (1x4, 2x2, 2x4)	$50 per fixture
LED Fuel Pump Canopy	$100 per fixture
LED Screw-based & Pin-based (PAR, MR, BR, R) Standards (A-Style) and Decorative Lamps	$10 per lamp for R/PAR20,MR/PAR16,Globe,Candelabra or Misc $20 per lamp for R/BR/PAR 30, R/BR/PAR 38-40, A-Lamp
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$30 per 4 foot $42 per 5 foot $65 per 6 foot
LED Retrofit Kits	To be evaluated through the customer measure path

Lighting Controls – Occupancy Sensors

Wall Mounted (Existing Facilities Only)	$20 per control
Remote Mounted (Existing Facilities Only)	$35 per control
Daylight Dimming Controls	$45 per fixture controlled
Occupancy Based hi-low Dimming Control	$35 per fixture controlled
Occupancy Sensor Remote Mounted	$35 per control

Refrigeration Doors/Covers

Energy-Efficient Doors/Covers for Installation on Open Refrigerated Cases	$100 per door
Aluminum Night Curtains for Installation on Open Refrigerated Cases	$3.50 per linear foot

Refrigeration Controls

Door Heater Controls	$50 per control
Electric Defrost Controls	$50 per control
Evaporator Fan Controls	$75 per control
Novelty Cooler Shutoff	$50 per control

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2007 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and an IRR of at least 10%.

APPENDIX C

ENERGY STAR® Statement of Energy Performance

80

ENERGY STAR® Score[1]

Prosecutor's Building

Primary Property Function: Office
Gross Floor Area (ft²): 32,205
Built: 1959

For Year Ending: December 31, 2013
Date Generated: May 14, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Prosecutor's Building 119 Hooper Avenue Toms River, New Jersey 08753	Ocean County 239 Washington Street Building #5 Toms River, NJ 08753 (____)____-_____	Joseph Meyers 239 Washington Street Building #5 Toms River, NJ 08753 732-929-2039 JosephMeyers@co.ocean.nj.us

Property ID: 4046920

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
89.5 kBtu/ft²

Source EUI
184.7 kBtu/ft²

Annual Energy by Fuel	
Electric - Solar (kBtu)	154,087 (5%)
Natural Gas (kBtu)	1,327,645 (46%)
Electric - Grid (kBtu)	1,401,149 (49%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	132.4
National Median Source EUI (kBtu/ft²)	273.2
% Diff from National Median Source EUI	-32%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	267

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

Prosecutor's Building

Split System Units

Tag	CU-1	CU-2	CU-3
Unit Type	Split Air-Cooled Condensing Unit	Split Air-Cooled Condensing Unit	Split Air-Cooled Condensing Unit
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served			
Manufacturer	Trane	Trane	Trane
Model #	TTA060C300A0	TTA060C300A0	TTA060C300A0
Serial #	L353MC5FF	L382HD6FF	L372LK4FF
Cooling Type	DX Coil	DX Coil	DX Coil
Cooling Capacity (Tons)	5 Tons	5 Tons	5 Tons
Cooling Efficiency (SEER/EER)	SEER = 11	SEER = 11	SEER = 11
Fuel	Electric	Electric	Electric
Approx Age	18	18	18
ASHRAE Service Life	15	15	15
Remaining Life	(3)	(3)	(3)
Comments			

Note:

"N/A" = Not Applicable.

"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Prosecutor's Building

RTUs

Tag	RTU-1	RTU-2	RTU-3
Unit Type	Packaged Rooftop AC Units	Packaged Rooftop AC Units	Packaged Rooftop AC Units
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	1st Floor, Basement and Part of 2nd Floor	Portions of 2nd and 3rd Floors	Portions of 2nd and 3rd Floors
Manufacturer	Trane IntelliPak	Trane	Trane
Model #	SXHFC60E0F56C	TCD090D300	TCD090D300
Serial #	J96B70469	L14101415D	L14101416D
Cooling Type	DX Coil	DX Coil	DX Coil
Cooling Capacity (Tons)	60 Tons	7.5 Tons	7.5 Tons
Cooling Efficiency (EER)	EER = 9.5	EER = 9.0	EER = 9.0
Supply Fan (HP)	30	2	2
Exhaust Fan (HP)	7.5	½	½
Approx Age	18	18	18
ASHRAE Service Life	15	15	15
Remaining Life	(3)	(3)	(3)
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Prosecutor's Bldg.

Domestic Water Heaters

Tag	DHW-1	
Unit Type	Storage Water Heater	
Qty	1	
Location	Mechanical Room	
Area Served	Entire Facility	
Manufacturer	A. O. Smith	
Model #	BTC 120 920	
Serial #	MJ95-0462242-920	
Size (Gallons)	75	
Input Capacity (MBH/KW)	120 MBH	
Recovery (Gal/Hr)	109.1 GPH @ 100°F Rise	
Efficiency %	80%	
Fuel	Natural Gas	
Approx Age	19	
ASHRAE Service Life	12	
Remaining Life	(7)	
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Prosecutor's Building

Boilers

Tag	B-1 thru B-6	
Unit Type	Modular Cast Iron Hot Water Boilers	
Qty	6	
Location	Boiler Room	
Area Served	Entire Building	
Manufacturer	Multi-Temp	
Model #	MR 1800B	
Serial #	-	
Input Capacity (Btu/Hr)	300 MBH / Module 1,800 MBH Total	
Rated Output Capacity (Btu/Hr)	1,440 MBH	
Approx. Efficiency %	80% (new)	
Fuel	Natural Gas	
Approx Age	18	
ASHRAE Service Life	25	
Remaining Life	7	
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Prosecutor's Building

Pumps

Tag	P-1	P-2
Unit Type	Base Mounted End Suction Pump	Base Mounted End Suction Pump
Qty	1	1
Location	Mechanical Room	Mechanical Room
Area Served	Entire Facility	Entire Facility
Manufacturer	Taco	Taco
Model #	-	-
Serial #	-	-
Horse Power	5	5
Flow	115 GPM @ 65' TDH	115 GPM @ 65' TDH
Motor Info	Balbor	Baldor
Electrical Power	208/3/60	208/3/60
RPM	1750	1750
Motor Efficiency	81.5%	81.5%
Approx Age	18	18
ASHRAE Service Life	20	20
Remaining Life	2	2
Comments		

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

MAJOR EQUIPMENT LIST

Concord Engineering Group

Prosecutor's Building

Data Center Units

Tag	AC-1	ACCU-1	
Unit Type	Data Center HVAC Unit	Split Air-Cooled Condensing Unit	
Qty	1	1	
Location	Data Center	Roof	
Area Served	Data Center	Data Center	
Manufacturer	Liebert	Liebert	
Model #	MME018E	DMC020A	
Serial #	-	-	
Cooling Type	DX Coil	DX Coil	
Cooling Capacity (Tons)	1.5 Tons	1.5 Tons	
Cooling Efficiency (SEER/EER)			
Fuel	Electric	Electric	
Approx Age	18	18	
ASHRAE Service Life	15	15	
Remaining Life	(3)	(3)	
Comments			

Note:
"N/A" = Not Applicable.
"-" = Info Not Available

APPENDIX E

CEG Project #: 1C14065
Facility Name: Prosecutors Building
Address: 119 Hooper Ave.
City, State, Zip Toms River, NJ, 08753

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
221.34	Boiler Room 107A	4000	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	9	0.56	2,232	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	9	0.43	1,728	0.13	504	$66	0	No New Controls	0	0.0%	0	$0	$1,170.00	$585.00	$1,755.00	$450.00	19.92	$0.00	$0.00	$0.00	FALSE	-
232.21	File Room 106	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	15	1.41	5,076	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	15	0.83	2,970	0.59	2,106	$274	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	594	$77	$3,150.00	$975.00	$4,125.00	$750.00	12.33	$50.00	$50.00	$100.00	$20.00	1.04
232.21	Central Supply	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	3	0.28	1,015	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	594	0.12	421	$55	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	119	$15	$630.00	$195.00	$825.00	$150.00	12.33	$50.00	$50.00	$100.00	$20.00	5.18
232.21	Interview Room	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	12.33	$0.00	$0.00	$0.00	FALSE	-
221.34	Elec Room 108	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., No lens	2	62	6	0.37	446	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	6	0.29	346	0.08	101	$13	0	No New Controls	0	0.0%	0	$0	$780.00	$390.00	$1,170.00	$300.00	66.39	$0.00	$0.00	$0.00	FALSE	-
232.21	Files Room 109	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	12.33	$0.00	$0.00	$0.00	FALSE	-
232.21	Files Room 110	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	5	0.47	1,692	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	5	0.28	990	0.20	702	$91	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	198	$26	$1,050.00	$325.00	$1,375.00	$250.00	12.33	$50.00	$50.00	$100.00	$20.00	3.11
221.41	Files Room 110	3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	4	0.25	893	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	4	0.11	403	0.14	490	$64	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	81	$10	$660.00	$260.00	$820.00	$200.00	9.74	$50.00	$50.00	$100.00	$20.00	7.63
104A & 104B																																		
232.21	Major Crimes Unit	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	17	1.60	5,753	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	17	0.94	3,366	0.66	2,387	$310	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	673	$88	$3,570.00	$1,105.00	$4,675.00	$850.00	12.33	$200.00	$50.00	$250.00	$35.00	2.46
221.12	Major Crimes Unit	3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Parabolic Lens	2	62	12	0.74	2,678	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-LD1-41-F-UNV-L840-CD1-U	1	48	12	0.58	2,074	0.17	605	$79	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	415	$54	$1,560.00	$780.00	$2,340.00	$600.00	22.13	$200.00	$50.00	$250.00	$35.00	3.99
232.21	Interview Room	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	12.33	$0.00	$0.00	$0.00	FALSE	-
232.21	Capt. Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Lt Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$25.00	$25.00	$50.00	$20.00	2.91
232.21	Lt Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$25.00	$25.00	$50.00	$20.00	2.91
End 104A & 104B																																		
232.21	Men's Restroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	489	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	203	$26	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	57	$7	$420.00	$130.00	$550.00	$100.00	17.07	$25.00	$25.00	$50.00	FALSE	6.72
221.41	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$25.00	$25.00	$50.00	FALSE	26.42
232.21	Women's Restroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	489	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	203	$26	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	57	$7	$420.00	$130.00	$550.00	$100.00	17.07	$25.00	$25.00	$50.00	FALSE	6.72
221.41	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$25.00	$25.00	$50.00	FALSE	26.42
232.21	Assist. Prosecutor Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$210.00	$65.00	$275.00	$50.00	12.33	$25.00	$25.00	$50.00	FALSE	9.71
221.41	Assist. Prosecutor Office	3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	2	0.12	446	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	2	0.06	202	0.07	245	$32	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$280.00	$130.00	$410.00	$100.00	9.74	$25.00	$25.00	$50.00	FALSE	9.54
232.21	Juvenile Unit Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	14	1.32	4,738	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	14	0.77	2,772	0.55	1,966	$256	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	554	$72	$2,940.00	$910.00	$3,850.00	$700.00	12.33	$200.00	$50.00	$250.00	$35.00	2.98
232.21	Office 112	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$210.00	$65.00	$275.00	$50.00	12.33	$25.00	$25.00	$50.00	FALSE	9.71
221.41		3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	2	0.12	446	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	2	0.06	202	0.07	245	$32	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$280.00	$130.00	$410.00	$100.00	9.74	$25.00	$25.00	$50.00	FALSE	9.54
232.21	Office 113	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$210.00	$65.00	$275.00	$50.00	12.33	$25.00	$25.00	$50.00	FALSE	9.71
221.41		3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	2	0.12	446	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	2	0.06	202	0.07	245	$32	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$280.00	$130.00	$410.00	$100.00	9.74	$25.00	$25.00	$50.00	FALSE	9.54
232.21	Office 114	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$210.00	$65.00	$275.00	$50.00	12.33	$25.00	$25.00	$50.00	FALSE	9.71
221.41		3600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	2	0.12	446	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	2	0.06	202	0.07	245	$32	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	40	$5	$280.00	$130.00	$410.00	$100.00	9.74	$25.00	$25.00	$50.00	FALSE	9.54
232.21	Office 115	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3		2	0.00	0	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	(0.11)	(396)	($51)	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	(8.74)	$50.00	$50.00	$100.00	FALSE	9.71
232.21	Training 103	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	9	0.85	3,046	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	9	0.50	1,782	0.35	1,264	$164	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	356	$46	$1,890.00	$585.00	$2,475.00	$450.00	12.33	$50.00	$50.00	$100.00	$20.00	1.73

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
232.21	Office 102	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
227.211	Corridor	3600	2x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	2	34	2	0.07	245	Replace Fixture	2x2 LED Recessed 3600 Lumen 38w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	38	2	0.08	274	(0.01)	(29)	($4)	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	(85.47)	$0.00	$0.00	$0.00	FALSE	-
232.21	Corridor	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	5	0.47	1,692	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	5	0.28	990	0.20	702	$91	0	No New Controls	0	0.0%	0	$0	$1,050.00	$325.00	$1,375.00	$250.00	12.33	$0.00	$0.00	$0.00	FALSE	-
601	Corridor	3600	(2) 7w CFL Exit Sign	2	16	4	0.06	230	Replace Fixture	LED Exit Sign	1	2	4	0.01	29	0.06	202	$26	0	No New Controls	0	0.0%	0	$0	$100.00	$320.00	$420.00	$0.00	16.03	$0.00	$0.00	$0.00	FALSE	-
232.21	Office 101	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	101 Storage	1200	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	226	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	132	0.08	94	$12	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	36.98	$0.00	$0.00	$0.00	FALSE	-
902	Lobby	3600	250w MH Recessed Down Light	1	285	4	1.14	4,104	Bypass Ballast, Relamp	Solstice 60w LED Retrofit	1	93	4	0.37	1,339	0.77	2,765	$359	0	No New Controls	0	0.0%	0	$0	$1,000.00	$600.00	$1,600.00	$0.00	4.45	$0.00	$0.00	$0.00	FALSE	-
900	Lobby	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	14	0.50	1,814	Existing to Remain	No Change	2	36	0	0.50	1,814	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
601	Lobby	3600	(2) 7w CFL Exit Sign	2	16	1	0.02	58	Replace Fixture	LED Exit Sign	1	2	1	0.00	7	0.01	50	$7	0	No New Controls	0	0.0%	0	$0	$25.00	$80.00	$105.00	$0.00	16.03	$0.00	$0.00	$0.00	FALSE	-
900	1st Fl. - Reception	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	11	0.40	1,426	Existing to Remain	No Change	2	36	0	0.40	1,426	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
232.21	Duty Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 229	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Drug Court Unit 201	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	3	0.28	1,015	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	3	0.17	594	0.12	421	$55	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	119	$15	$630.00	$195.00	$825.00	$150.00	12.33	$50.00	$50.00	$100.00	$20.00	5.18
232.21	201 Side Office (2)	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	2	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$100.00	$100.00	$200.00	$20.00	8.74
900	Vestibule	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	2	0.07	259	Existing to Remain	No Change	2	36	0	0.07	259	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
232.21	Receptionist	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	12.33	$0.00	$0.00	$0.00	FALSE	-
232.21	202 Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	6	0.56	2,030	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,188	0.23	842	$110	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	238	$31	$1,260.00	$390.00	$1,650.00	$300.00	12.33	$50.00	$50.00	$100.00	$20.00	2.59
232.21	202 Side Office (2)	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	2	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$100.00	$100.00	$200.00	$20.00	8.74
221.41	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$50.00	$50.00	$100.00	FALSE	52.83
221.41	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$50.00	$50.00	$100.00	FALSE	52.83
232.21	Office 222	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
232.21	Office 223	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 224	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 225	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 226	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
227.21	Assist Pros Office	3600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	893	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	662	0.06	230	$30	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	132	$17	$580.00	$260.00	$840.00	$200.00	21.37	$50.00	$50.00	$100.00	$20.00	4.65
232.21	Lt Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Corridor	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	22	2.07	7,445	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	22	1.21	4,356	0.86	3,089	$402	0	No New Controls	0	0.0%	0	$0	$4,620.00	$1,430.00	$6,050.00	$1,100.00	12.33	$0.00	$0.00	$0.00	FALSE	-
227.21	Corridor	3600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	4	0.25	893	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	4	0.18	662	0.06	230	$30	0	No New Controls	0	0.0%	0	$0	$580.00	$260.00	$840.00	$200.00	21.37	$0.00	$0.00	$0.00	FALSE	-
601	Corridor	3600	(2) 7w CFL Exit Sign	2	16	6	0.10	346	Replace Fixture	LED Exit Sign	1	2	6	0.01	43	0.08	302	$39	0	No New Controls	0	0.0%	0	$0	$150.00	$480.00	$630.00	$0.00	16.03	$0.00	$0.00	$0.00	FALSE	-
232.21	Office 221	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77

EXISTING FIXTURES									PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS						LIGHTING RETROFIT COSTS					LIGHTING CONTROLS COST				
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
232.21	Office 220	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Library	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
900	Library	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	8	0.29	1,037	Existing to Remain	No Change	2	36	0	0.29	1,037	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	207	$27	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	$20.00	2.97
232.21	Trial Section Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	15	1.41	5,076	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	15	0.83	2,970	0.59	2,106	$274	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	594	$77	$3,150.00	$975.00	$4,125.00	$750.00	12.33	$400.00	$100.00	$500.00	$35.00	6.02
900	Conf. Room 227	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	8	0.29	1,037	Existing to Remain	No Change	2	36	0	0.29	1,037	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	207	$27	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	$20.00	2.97
232.21	Office 203	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 204	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 205	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 207	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 208	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 209	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 210	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Copy/Kitchen	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	211A Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	12	1.13	4,061	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	12	0.66	2,376	0.47	1,685	$219	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	475	$62	$2,520.00	$780.00	$3,300.00	$600.00	12.33	$200.00	$50.00	$250.00	$35.00	3.48
227.21	211A Open Office	3600	2x2, 2 Lamp, 32w U T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	446	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	331	0.03	115	$15	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	21.37	$0.00	$0.00	$0.00	FALSE	-
601	211A Open Office	3600	(2) 7w CFL Exit Sign	2	16	1	0.02	58	Replace Fixture	LED Exit Sign	1	2	1	0.00	7	0.01	50	$7	0	No New Controls	0	0.0%	0	$0	$25.00	$80.00	$105.00	$0.00	16.03	$0.00	$0.00	$0.00	FALSE	-
232.21	Ex. Assist Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Admin Services Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	8	0.75	2,707	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	8	0.44	1,584	0.31	1,123	$146	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	317	$41	$1,680.00	$520.00	$2,200.00	$400.00	12.33	$200.00	$50.00	$250.00	$35.00	5.22
232.21	Lt Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Chief Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Men's Restroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	489	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	203	$26	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	57	$7	$420.00	$130.00	$550.00	$100.00	17.07	$25.00	$25.00	$50.00	FALSE	6.72
221.41	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$25.00	$25.00	$50.00	FALSE	26.42
232.21	Women's Restroom	2600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	489	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	286	0.08	203	$26	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	57	$7	$420.00	$130.00	$550.00	$100.00	17.07	$25.00	$25.00	$50.00	FALSE	6.72
221.41	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-LD1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$25.00	$25.00	$50.00	FALSE	26.42
232.21	219 Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	6	0.56	2,030	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,188	0.23	842	$110	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	238	$31	$1,260.00	$390.00	$1,650.00	$300.00	12.33	$50.00	$50.00	$100.00	$20.00	2.59
232.21	219 Side Office (2)	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	2	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$100.00	$100.00	$200.00	$20.00	8.74
232.21	212A Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	6	0.56	2,030	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,188	0.23	842	$110	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	238	$31	$1,260.00	$390.00	$1,650.00	$300.00	12.33	$50.00	$50.00	$100.00	$20.00	2.59
232.21	218 Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
232.21	212 Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
232.21	212 Side Office (2)	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	6	0.56	2,030	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,188	0.23	842	$110	6	Dual Technology Occupancy Sensor - Switch Mnt.	2	20.0%	238	$31	$1,260.00	$390.00	$1,650.00	$300.00	12.33	$100.00	$100.00	$200.00	$20.00	5.83
232.21	Vestibule	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	12.33	$0.00	$0.00	$0.00	FALSE	-

			EXISTING FIXTURES						PROPOSED FIXTURE RETROFIT							RETROFIT ENERGY SAVINGS			PROPOSED LIGHTING CONTROLS					LIGHTING RETROFIT COSTS						LIGHTING CONTROLS COST					
Fixture Reference #	Location	Average Burn Hours	Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Work Description	Equipment Description	Lamps per Fixture	Watts per Fixture	Qty of Fixtures	Total kW	Usage kWh/Yr	Energy Savings, kW	Energy Savings, kWh	Energy Savings, $	Control Ref #	Controls Description	Qty of Controls	Hour Reduction %	Energy Savings, kWh	Energy Savings, $	Material	Total Labor	Total All	Rebate Estimate	Simple Payback	Total Materials	Total Labor	Total All	Smart Start Incentive	Simple Payback
601	Vestibule	3600	(2) 7w CFL Exit Sign	2	16	1	0.02	58	Replace Fixture	LED Exit Sign	1	2	1	0.00	7	0.01	50	$7	0	No New Controls	0	0.0%	0	$0	$25.00	$80.00	$105.00	$0.00	16.03	$0.00	$0.00	$0.00	FALSE	-
232.21	Crim. Case Unit Open Office	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$25.00	$25.00	$50.00	$20.00	1.46
227.21	Crim. Case Unit Open Office	3600	2x2, 2 Lamp, 32w U TB, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	446	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	331	0.03	115	$15	6	Dual Technology Occupancy Sensor - Switch Mnt.	0.5	20.0%	66	$9	$290.00	$130.00	$420.00	$100.00	21.37	$25.00	$25.00	$50.00	FALSE	5.81
232.21	Office 213	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
232.21	Office 214	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Office 215	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.21	Open Office - rear	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	13	1.22	4,399	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	13	0.72	2,574	0.51	1,825	$237	5	Dual Technology Occupancy Sensor - Remote Mnt.	1	20.0%	515	$67	$2,730.00	$845.00	$3,575.00	$650.00	12.33	$200.00	$50.00	$250.00	$35.00	3.21
227.21	Open Office - rear	3600	2x2, 2 Lamp, 32w U TB, Elect. Ballast, Recessed Mnt., Parabolic Lens	2	62	2	0.12	446	Replace Fixture	2x2 LED Recessed 3800 Lumen 46w Cooper #22AC-LD3-38-UNV-L840-CD1-U	1	46	2	0.09	331	0.03	115	$15	0	No New Controls	0	0.0%	0	$0	$290.00	$130.00	$420.00	$100.00	21.37	$0.00	$0.00	$0.00	FALSE	-
232.21	Copy	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	12.33	$0.00	$0.00	$0.00	FALSE	-
232.21	Office 216	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	6	0.56	2,030	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	6	0.33	1,188	0.23	842	$110	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	238	$31	$1,260.00	$390.00	$1,650.00	$300.00	12.33	$50.00	$50.00	$100.00	$20.00	2.59
232.21	Office 217	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	79	$10	$420.00	$130.00	$550.00	$100.00	12.33	$50.00	$50.00	$100.00	$20.00	7.77
232.22	Office 301	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
232.22	Office 307	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
900	Reception/Open Office	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	18	0.65	2,333	Existing to Remain	No Change	2	36	0	0.65	2,333	0.00	0	$0	5	Dual Technology Occupancy Sensor - Remote Mnt.	2	20.0%	467	$61	$0.00	$0.00	$0.00	$0.00	-	$400.00	$100.00	$500.00	$35.00	7.67
901	Receptionist	3600	Wall Sconce, 2 Lamp, 13w PL	2	26	4	0.10	374	Existing to Remain	No Change	2	26	0	0.10	374	0.00	0	$0	0	No New Controls	0	0.0%	0	$0	$0.00	$0.00	$0.00	$0.00	-	$0.00	$0.00	$0.00	FALSE	-
900	Conf Room 302	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	8	0.29	1,037	Existing to Remain	No Change	2	36	0	0.29	1,037	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	207	$27	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	$20.00	2.97
221.14	Roof Access	1200	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., No lens	2	62	2	0.12	149	Replace Fixture	4' LED 4100 Lumen Surface Wrap 48w Cooper #4WNLED-L-D1-41-F-UNV-L840-CD1-U	1	48	2	0.10	115	0.03	34	$4	0	No New Controls	0	0.0%	0	$0	$260.00	$130.00	$390.00	$100.00	66.39	$0.00	$0.00	$0.00	FALSE	-
221.41	Men's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-L-D1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$50.00	$50.00	$100.00	FALSE	52.83
221.41	Women's Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-L-D1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$50.00	$50.00	$100.00	FALSE	52.83
232.21	Files	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	3	94	1	0.09	338	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	1	0.06	198	0.04	140	$18	0	No New Controls	0	0.0%	0	$0	$210.00	$65.00	$275.00	$50.00	12.33	$0.00	$0.00	$0.00	FALSE	-
232.22	Office 303	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	158	$21	$840.00	$260.00	$1,100.00	$200.00	12.33	$50.00	$50.00	$100.00	$20.00	3.89
900	Office 303	3600	Recessed Down Light, 2 Lamp, 18w PL	2	36	9	0.32	1,166	Existing to Remain	No Change	2	36	0	0.32	1,166	0.00	0	$0	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	233	$30	$0.00	$0.00	$0.00	$0.00	-	$50.00	$50.00	$100.00	$20.00	2.64
221.41	303 Restroom	2600	1x4, 2 Lamp, 32w T8, Elect. Ballast, Wall/Corner Mnt., Prismatic Lens	2	62	1	0.06	161	Replace Fixture	4' LED 3100 Lumen Surface Wrap 28w Cooper #SNLED-L-D1-31-LC-UNV-L840-CD1-U	1	28	1	0.03	73	0.03	88	$11	6	Dual Technology Occupancy Sensor - Switch Mnt.	1	20.0%	15	$2	$140.00	$65.00	$205.00	$50.00	13.49	$50.00	$50.00	$100.00	FALSE	52.83
232.22	Office 304	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	94	2	0.19	677	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	2	0.11	396	0.08	281	$37	0	No New Controls	0	0.0%	0	$0	$420.00	$130.00	$550.00	$100.00	12.33	$0.00	$0.00	$0.00	FALSE	-
232.22	Office 305	3600	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Parabolic Lens	3	94	4	0.38	1,354	Replace Fixture	2x4 LED Recessed 5800 Lumen 55w Cooper #24AC-LD3-55-UNV-L840-CD1-U	1	55	4	0.22	792	0.16	562	$73	0	No New Controls	0	0.0%	0	$0	$840.00	$260.00	$1,100.00	$200.00	12.33	$0.00	$0.00	$0.00	FALSE	-
903	Exterior	4400	100w HPS White Globe Area Light - Pole Mount	1	120	12	1.44	6,336	Bypass Ballast, Relamp	40w LED 360 Degree Lamp	1	40	12	0.48	2,112	0.96	4,224	$549	0	No New Controls	0	0.0%	0	$0	$1,800.00	$1,200.00	$3,000.00	$0.00	5.46	$0.00	$0.00	$0.00	FALSE	-
904	Exterior	4400	100w HPS White Globe Area Light - Wall Mount	1	120	6	0.72	3,168	Bypass Ballast, Relamp	40w LED 360 Degree Lamp	1	40	6	0.24	1,056	0.48	2,112	$275	0	No New Controls	0	0.0%	0	$0	$900.00	$600.00	$1,500.00	$0.00	5.46	$0.00	$0.00	$0.00	FALSE	-
905	Exterior	4400	250w HPS Wall Pack	1	295	1	0.30	1,298	Replace Fixture	RAB 52W LED Wall Pack	1	61	1	0.06	268	0.23	1,030	$134	0	No New Controls	0	0.0%	0	$0	$200.00	$150.00	$350.00	$100.00	1.87	$0.00	$0.00	$0.00	FALSE	-
	TOTAL					491	39	141,151					409	24	84,154	16	56,998	$7,410			83		12,596	$1,637	$77,725	$27,835	$105,560	$18,750	11.72	$5,650	$4,150	$9,800	$1,400.00	5.13