

Light Replacement for HCU Marine Laboratory in Trinidad

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Major: Environmental Resources Engineering

Expected Graduation: May 2019

Abstract:

A survey and report was done by Redwood Coast Energy Authority on the Humboldt State University Marine Laboratory. This report showed that by doing simple changes to the Marine Laboratory lighting; the university could potentially save an estimated saving of \$9,439.93 per year and estimated energy savings of 44,952 kWh per year.

Project Description:

For this project the Marine Laboratory: Rooms 101-122, Main Hall, Exterior East, Exterior North, Exterior West, Hall H-1-1, entrance, and office 100 would have either 4' lamps that are non-pcb ballast or HID 250W ballast removed and properly disposed of. Most of the bulbs can be recycled with some reimbursement. In some of the areas mention the light fixture will be removed and replaced as well.

Need Statement:

This project address HEIF's mission in that me, as a student would like to see this project of lowering the energy useage of the Marine Laboratory. This laboratory is a Humboldt State University facility that is managed through the school. I believe this project can be held accountable through quantitative and qualitative results as I have provided the report done by Redwood Coast Energy that show an estimate in the numbers expected to achieve through this project. And as for student involvement, the major Environmental Resources Engineering provides a course of Energy Building Analysis where we can get some of the students to perform an analysis of the building before and after the project.

Outcome:

The benefits of this project is its simplicity. All that needs to be done is purchase the LED lights and self install them. Self installment could mean we get students involved in the process of installing or the employees of Humboldt State Facility Management could install them. This project is tangible because to make a difference in energy consumption of this facility the initial purchase does not need to be of all recommend areas, but could be of five or more of the recommended areas. But to have the highest environmental impact in reduction of energy all presented replacements should be made in a timely manner.

Partners:

Partners include Redwood Coast Energy Authority, Facilities management, interested students, and Morgan King to support this project.

Appendix:

Redwood Coast Energy Authority Customer Report of Humboldt State University- Maine Laboratory.



Humboldt State University - Marine Laboratory

570 Ewing St
Trinidad, CA, 95570

Customer Report

Utility & Rate:	PG&E, A10s	Program:	Energy Watch 2016-2018
Business Type:	Education - University (EUN)	Audit Type:	Assessment Phase 1
Survey Date:	October 28, 2016	Audit #:	4514
Report Date:	January 24, 2017	Batch #:	

Presented To: Morgan King **T:** 707-826-3011 **M:** 707-497-9482 **Email:** Morgan.King@humboldt.edu
Title: Sustainability & Waste C **Address:** Humboldt State University - Campus Facility, 1 Harpst St, Arcata, CA 95521

Site Contact: Morgan King **T:** 707-826-3011 **M:** 707-497-9482 **Email:** Morgan.King@humboldt.edu

Project Summary - Assessment Phase 1

Total Installed Cost:	\$34,388.17
Instant Rebate:	- \$5,313.78
Your Final Cost:	\$29,074.39

Estimated Savings:	\$9,439.92 per year
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Simple Payback:	3.1 years
Return On Investment:	32%
Rebate % of Total Cost:	15%
Estimated Monthly Savings:	\$786.66
Estimated Energy Savings:	44,952 kWh/yr
Power Reduction:	11.044 kW
CO₂ Emissions Reduction:	12,878 lbs/yr

(Calculations based on average cost of \$0.21 per kWh and 16COM_CP_HTR rebate.)

The instant rebate is based on proposed energy savings. If actual installation and/or energy savings vary from as specified here within, RCEW reserves the right to recalculate the rebate amount. RCEW recommends that you retain this report for your records

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Project Mgr: Matt Tolley
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633 3rd Street
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Contractor: Self Install
Redwood Coast Energy Authority
633 3rd Street
Eureka, CA 95501
Tel 707.269.1700
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The Redwood Coast Energy Watch is funded by California utility ratepayers under the auspices of the California Public Utilities Commission.

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
Area A: Entrance				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-FIXT-4'-WRAP, 5000 °K	B/B			\$13.23
*** Fixture is located at entrance to facility and a new WRAP fixture with TLEDS is primary recommendation				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-FIXT-4'-WRAP, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing wrap fixture; Install new 4' wrap fixture with (2) 12W 4' LED T8 tubes (Philips InstantFit or equivalent)		1	\$175.25	
Spec: 5000 °K lamp color temperature				
Area A1: Office 100				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-FIXT-4'-WRAP, 5000 °K	B/B			\$55.23
*** Replace existing fixture				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-FIXT-4'-WRAP, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing wrap fixture; Install new 4' wrap fixture with (2) 12W 4' LED T8 tubes (Philips InstantFit or equivalent)		1	\$175.25	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-FIXT-4'-WRAP, 5000 °K	A/A			\$13.23
*** Replace existing fixture				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-FIXT-4'-WRAP, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing wrap fixture; Install new 4' wrap fixture with (2) 12W 4' LED T8 tubes (Philips InstantFit or equivalent)		1	\$175.25	
Spec: 5000 °K lamp color temperature				
Area B: RM 101				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Fixture is located at entranceto Room 101B				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		1	\$110.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
Area B1: RM 101A				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Fixture located in office				

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Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
<input checked="" type="checkbox"/> M: From (1) INC A19 60-1L to (1) LED INT 10E1-1L-A-LAMP	C/C			\$5.46
*** Fixture located in adjacent bathroom. Confirm 10W A19 LED is enclosed rated. Option 2 is an LED recessed can fixture at additional cost.				
PF: LED INT 10E1-1L-A-LAMP				
<input checked="" type="checkbox"/> Equip: Remove incandescent or CFL A-lamp; install 10W LED A-lamp (TCP)		1	\$9.00	
Area B2: RM 101B				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Fixture is located in RM 101B				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
Area C: RM 103				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Fixture is located at entrance to 103A				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
Area C1: RM 103A				
<input checked="" type="checkbox"/> M: From (1) INC A19 60-1L to (1) LED INT 10E1-1L-A-LAMP	C/C			\$5.46
*** Fixture located in Men's bathroom. Confirm installed 10W A19 LED is enclosed rated. Option 2 is an LED recessed can at additional cost.				
PF: LED INT 10E1-1L-A-LAMP				
<input checked="" type="checkbox"/> Equip: Remove incandescent or CFL A-lamp; install 10W LED A-lamp (TCP)		1	\$9.00	
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Fixture is located in Men's restroom.				
EF: T8 4' 32E2-2L-NPO				

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Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
Area C2: RM 103T				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Fixture is located in technology/server room, recommend addition of occupancy sensor if possible to limit hours of operaton. (~40 cost with no available rebate)	A/C			\$45.36
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area D: RM 102				
<input checked="" type="checkbox"/> M: From (1) INC A19 60-1L to (1) LED INT 10E1-1L-A-LAMP *** Fixture located in adjacent storage room. Confirm installed 10W A19 LED is enclosed rated. Option 2 is an LED recessed can at increased cost.	C/C			\$5.46
PF: LED INT 10E1-1L-A-LAMP				
<input checked="" type="checkbox"/> Equip: Remove incandescent or CFL A-lamp; install 10W LED A-lamp (TCP)		1	\$9.00	
Area E: RM 104				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Fixture is located in Men's Bathroom.	C/C			\$45.36
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area E1: RM 105				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Fixture is located in bathroom.	C/C			\$55.23
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				

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Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
<input checked="" type="checkbox"/> Area E2: RM 106				
*** Suspended WRAP fixtures in good condition				
<input checked="" type="checkbox"/> M: From (3) T8 4' 32E2-2L-NPO to (3) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$68.04
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		6	\$6.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		3	\$17.61	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		3	\$330.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		3	\$5.49	
<input checked="" type="checkbox"/> Area E3: RM 107				
<input checked="" type="checkbox"/> M: From (3) T8 4' 32E2-2L-NPO to (3) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$68.04
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		6	\$6.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		3	\$17.61	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		3	\$330.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		3	\$5.49	
<input checked="" type="checkbox"/> Area E4: RM 108				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$45.36
*** Confirm Fixture quantity and hours of operation.				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
<input checked="" type="checkbox"/> Area F: RM 109				
<input checked="" type="checkbox"/> M: From (4) T8 4' 32E2-2L-NPO to (4) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	E/E			\$19.74
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		8	\$8.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		4	\$23.48	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				

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Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		4	\$440.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		4	\$7.32	
Area F1: RM 109 A				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$45.36
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area F2: RM 109 B				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$45.36
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area F3: RM 109 C				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$26.25
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area F4: RM 109 D				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	E/E			\$13.23
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	

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Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
Area G: RM 110				
<input checked="" type="checkbox"/> M: From (3) T8 4' 32E2-2L-NPO to (3) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Confirm fixture quantity	E/E			\$14.70
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		6	\$6.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		3	\$17.61	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		3	\$330.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		3	\$5.49	
Area H: Hall H-1-1				
<input checked="" type="checkbox"/> M: From (7) T8 4' 32E2-2L-NPO to (7) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Confirm counts and schedules	A/A			\$91.98
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		14	\$14.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		7	\$41.09	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		7	\$770.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		7	\$12.81	
Area I: RM 111				
<input checked="" type="checkbox"/> M: From (6) T8 4' 32E2-2L-NPO to (6) LED T8 4' 12E2-2L-NPO (RE-LAMP), 5000 °K *** confirm existing ballast are compatible. (Option B). Existing fixtures are in good condition.	A/A			\$78.75
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		12	\$12.00	
PF: LED T8 4' 12E2-2L-NPO (RE-LAMP), 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 bulbs; Install LED tubes on compatible ballast (Philips InstantFit or Equivalent) Spec: 5000 °K lamp color temperature		6	\$480.00	
Area I1: RM 111A				
<input checked="" type="checkbox"/> M: From (5) T8 4' 32E2-2L-NPO to (5) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	E/E			\$24.78
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		10	\$10.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		5	\$29.35	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		5	\$550.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		5	\$9.15	

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
Area I2: RM 111B				
<input checked="" type="checkbox"/> M: From (10) T8 4' 32E2-2L-NPO to (10) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	E/E			\$57.33
*** electronic ballast alternative option				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		20	\$20.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		10	\$58.70	
PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent)		10	\$900.00	
Spec: 5000 °K lamp color temperature				
Area I3: RM 111C				
<input checked="" type="checkbox"/> M: From (10) T8 4' 32E2-2L-NPO to (10) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	E/E			\$57.33
*** electronic ballast alternative option				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		20	\$20.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		10	\$58.70	
PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent)		10	\$900.00	
Spec: 5000 °K lamp color temperature				
Area I4: RM 111D				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$45.36
*** Actual hours of operation may be lower.				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		2	\$220.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area J: RM 112				
<input checked="" type="checkbox"/> M: From (32) T8 4' 32E2-2L-NPO to (32) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	A/A			\$2,060.31
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		64	\$64.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		32	\$187.84	
PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent)		32	\$2,880.00	
Spec: 5000 °K lamp color temperature				
Area J1: RM 112C				

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications		Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/>	M: From (9) T8 4' 32E2-2L-NPO to (9) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	E/E			\$137.97
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		18	\$18.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		9	\$52.83	
	PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent)		9	\$810.00	
	Spec: 5000 °K lamp color temperature				
Area J2: RM 112B					
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$45.36
	*** Confirm hours of op.				
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		2	\$220.00	
	Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area J3: RM 112A					
<input checked="" type="checkbox"/>	M: From (4) T8 4' 32E2-2L-NPO to (4) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$52.50
	*** Option A				
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		8	\$8.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		4	\$23.48	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		4	\$440.00	
	Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		4	\$7.32	
Area K: RM 113					
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-STRIP-FIXTURE, 5000 °K	A/A			\$26.25
	*** New Strip Fixtures.				
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
	PF: LED T8 4' 12E2-2L-NPO-STRIP-FIXTURE, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing fixture; Install new 4' fluorescent strip fixture and (2) 12W LED tubes (Philips InstantFit or equivalent)		2	\$300.00	
	Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$45.36
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
<input checked="" type="checkbox"/> Area K1: RM 113A				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K (New 4' WRAP LENS)	C/C			\$13.23
*** Fixture is located in Room 113A				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K (New 4' WRAP LENS)				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		1	\$110.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
<input checked="" type="checkbox"/> Equip: Remove existing lens; install new 0.125" prismatic acrylic, 4' wrap lens, custom-fit		1	\$45.26	
<input checked="" type="checkbox"/> M: From (3) T8 4' 32E2-2L-NPO to (3) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$68.04
*** Fixtures are Direct/Indirect and may require a new lens at additional costs (confirm existing available lens).				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		6	\$6.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		3	\$17.61	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		3	\$330.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		3	\$5.49	
<input checked="" type="checkbox"/> Area K2: RM 113B				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	C/C			\$6.72
*** Confirm fixture quantity.				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
<input checked="" type="checkbox"/> Area K3: RM 113C				
*** Walk-In Cooler				
<input checked="" type="checkbox"/> M: From (1) INC A19 60-1L to (1) LED INT 10E1-1L-A-LAMP	C/C			\$5.46
*** Confirm existing fixture quantity.				

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
PF: LED INT 10E1-1L-A-LAMP				
<input checked="" type="checkbox"/> Equip: Remove incandescent or CFL A-lamp; install 10W LED A-lamp (TCP)		1	\$9.00	
<input checked="" type="checkbox"/> Area K4: RM 113D				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	B/B			\$13.23
*** Fixture is located at entranceto Room 113D, operational hours 24/7. Include Occupancy sensor at additional cost.				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		1	\$110.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
<input checked="" type="checkbox"/> Area K5: RM 113E				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Fixture is located at entrance to Room 113E, possibly include occupancy sensor at additional cost.				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		1	\$110.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
<input checked="" type="checkbox"/> Area L: RM 114				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$45.36
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		2	\$220.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
<input checked="" type="checkbox"/> Area L1: RM 114A				
*** Mechanical Room with high wattage CFL's and q1 150W inc.				
<input checked="" type="checkbox"/> M: From (2) CFL INT 65E1-1L to (2) LED INT 16E1-1L BR40, 2700 °K	A/A			\$42.84
*** confirm base type.				
PF: LED INT 16E1-1L BR40, 2700 °K				
<input checked="" type="checkbox"/> Equip: Remove existing BR40; Replace with LED PAR40 (Feit or equivalent)		2	\$30.46	
Spec: 2700 °K lamp color temperature				

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications		Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/>	M: From (1) INC A21 150-1L to (1) LED INT 16E1-1L BR40	A/A			\$58.80
	PF: LED INT 16E1-1L BR40				
<input checked="" type="checkbox"/>	Equip: Remove existing BR40; Replace with LED PAR40 (Feit or equivalent)		1	\$15.23	
Area M: RM 116D (Culture)					
*** Pilot Project for TLEDs, lighting needs require full spectrum to populate culture growth. Fixtures run 24 hours/day for propagation.					
<input checked="" type="checkbox"/>	M: From (21) T8 4' 32E2-2L-NPO to (21) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	B/B			\$1,352.19
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		42	\$42.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		21	\$123.27	
	PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent)		21	\$1,890.00	
	Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/>	M: From (5) T8 4' 32E2-2L-NPO to (5) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	A/A			\$76.65
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		10	\$10.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		5	\$29.35	
	PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent)		5	\$450.00	
	Spec: 5000 °K lamp color temperature				
Area N: RM 116					
<input type="checkbox"/>	M: From (6) T8 4' 32E2-2L-NPO to (6) LED T8 4' 12E2-2L-NPO (RE-LAMP), 5000 °K	A/A			\$78.75
	*** confirm existing ballast are compatible. (Option B)				
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		12	\$12.00	
	PF: LED T8 4' 12E2-2L-NPO (RE-LAMP), 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 bulbs; Install LED tubes on compatible ballast (Philips InstantFit or Equivalent)		6	\$480.00	
	Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/>	M: From (6) T8 4' 32E2-2L-NPO to (6) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$78.75
	*** Option A				
	EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		12	\$12.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		6	\$35.22	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		6	\$660.00	
	Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		6	\$10.98	
Area N1: RM 116A					

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications		Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Fixtures are suspended D/ID EF: T8 4' 32E2-2L-NPO	A/C			\$45.36
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area N2: RM 116B					
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO	A/C			\$45.36
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area N3: RM 116C					
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO	A/A			\$45.36
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area N4: RM 116 E					
<input checked="" type="checkbox"/>	M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO	A/A			\$45.36
<input checked="" type="checkbox"/>	Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/>	Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
	PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/>	Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/>	Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area O: RM 117					

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> M: From (4) T8 4' 32E2-2L-NPO to (4) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO <input checked="" type="checkbox"/> Equip: Recycle 4' lamp <input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K <input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent) Spec: 5000 °K lamp color temperature	A/A			\$257.46
Area P: RM 118				
<input checked="" type="checkbox"/> M: From (4) T8 4' 32E2-2L-NPO to (4) LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO <input checked="" type="checkbox"/> Equip: Recycle 4' lamp <input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast PF: LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K <input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install (2) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent) Spec: 5000 °K lamp color temperature	A/A			\$61.32
Area P1: RM 118A				
<input checked="" type="checkbox"/> M: From (2) CFL INT 65E1-1L to (2) LED INT 16E1-1L BR40 PF: LED INT 16E1-1L BR40 <input checked="" type="checkbox"/> Equip: Remove existing BR40; Replace with LED PAR40 (Feit or equivalent)	A/A			\$42.84
<input checked="" type="checkbox"/> M: From (1) INC A21 150-1L to (1) LED INT 16E1-1L BR40 PF: LED INT 16E1-1L BR40 <input checked="" type="checkbox"/> Equip: Remove existing BR40; Replace with LED PAR40 (Feit or equivalent)	A/A			\$58.80
Area Q: RM 119 (Wet Lab)				
<input checked="" type="checkbox"/> M: From (21) T8 4' 32E4-4L-NPO to (21) LED T8 4' 12E4-4L-DRIVER-RETRO, 5000 °K *** Existing fixtures are vaportight, with difficult access. Option 2 is new LED integrated vapor tight fixture at additional cost. EF: T8 4' 32E4-4L-NPO <input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast <input checked="" type="checkbox"/> Equip: Recycle 4' lamp PF: LED T8 4' 12E4-4L-DRIVER-RETRO, 5000 °K <input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install (4) LED tubes (Philips InstantFit or equivalent) and LED Driver (Philips Advance or equivalent) Spec: 5000 °K lamp color temperature	A/A			\$588.84
Area Q1: RM 119A				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO <input checked="" type="checkbox"/> Equip: Recycle 4' lamp <input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/C			\$45.36

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area Q2: RM 119B				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Confirm fixture quantity (1) EF: T8 4' 32E2-2L-NPO	A/C			\$45.36
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area R: RM 120				
<input checked="" type="checkbox"/> M: From (2) T8 4' 32E2-2L-NPO to (2) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K EF: T8 4' 32E2-2L-NPO	A/C			\$45.36
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		4	\$4.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		2	\$11.74	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		2	\$220.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		2	\$3.66	
Area S: RM 121				
*** Area is sensitive to light levels at night, existing occupancy sensors in place. Possibility for step dimming retrofits with driver kits at slight increase in cost.				
<input checked="" type="checkbox"/> M: From (25) T8 4' 32E2-2L-NPO to (25) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K *** Confirm light levels are directional and minimal to no light pollution is a possibility EF: T8 4' 32E2-2L-NPO	A/A			\$1,379.70
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		50	\$50.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		25	\$146.75	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast Spec: 5000 °K lamp color temperature		25	\$2,750.00	
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		25	\$45.75	
<input checked="" type="checkbox"/> M: From (3) T8 4' 32E2-1L-NPO to (3) LED T8 4' 12E2-2L-NPO-FIXT-4'-STRIP, 5000 °K *** Suspended strip fixtures located above work bench EF: T8 4' 32E2-1L-NPO	A/A			\$9.24
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		3	\$3.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		3	\$17.61	

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
PF: LED T8 4' 12E2-2L-NPO-FIXT-4'-STRIP, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing fixture; Install new 4' fluorescent strip fixture and (2) 12W LED tubes (Philips InstantFit or equivalent)		3	\$450.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Area S1: RM 121A				
<input checked="" type="checkbox"/> M: From (1) T8 4' 32E2-2L-NPO to (1) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$55.23
*** Troffer Fixture				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		2	\$2.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		1	\$5.87	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		1	\$110.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		1	\$1.83	
<input checked="" type="checkbox"/> Area T: RM 122				
*** No Recommendations, existing fixtures have speciality lamps in place.				
<input checked="" type="checkbox"/> Area U: Main Hall				
<input checked="" type="checkbox"/> M: From (7) T8 4' 32E2-2L-NPO to (7) LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	A/A			\$91.98
*** Confirm counts and schedules, one fixture may be 24/7 for egress				
EF: T8 4' 32E2-2L-NPO				
<input checked="" type="checkbox"/> Equip: Recycle 4' lamp		14	\$14.00	
<input checked="" type="checkbox"/> Equip: Dispose of 4' lamp Non-PCB ballast		7	\$41.09	
PF: LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing T8 or T12 bulbs and ballast; Install LED tubes (Philips InstantFit or equivalent) and compatible NPO Instant Start ballast		7	\$770.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> Equip: Install Ideal Power Plug Luminaire Disconnect (or equivalent) at luminaire power input		7	\$12.81	
<input checked="" type="checkbox"/> Area Y: Exterior East				
<input checked="" type="checkbox"/> M: From (3) HPS 100M1-1L to (3) LED 30E1-1L-FIXT-WALL-PACK, 5000 °K Lumark (XTOR3ARL-PC or Equiv.)	D/D			\$279.30
*** Option B, 20W WP. Fixtures located at RM 112B, 113, 114, entrances.				
EF: HPS 100M1-1L				
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		3	\$18.00	
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		3	\$33.00	
PF: LED 30E1-1L-FIXT-WALL-PACK, 5000 °K Lumark (XTOR3ARL-PC or Equiv.)				
<input checked="" type="checkbox"/> Equip: Remove Existing Wallpack fixture; Install 30 watt LED wallpack (Lumark XTORARL or Equiv.)		3	\$1,035.00	
Spec: 5000 °K lamp color temperature				
<input checked="" type="checkbox"/> M: From (1) MH 100M1-1L to (1) LED 43E1-1L-FIXT-FLOOD, 5000 °K	D/D			\$37.17
*** Option B, Lumark 30ARL w/ full cut off.				
EF: MH 100M1-1L				
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		1	\$11.00	
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		1	\$6.00	
PF: LED 43E1-1L-FIXT-FLOOD, 5000 °K				

For help reading this report, see the Abbreviations and Terminology section that follows

Proposed Measures, Equipment, and Specifications	Pre/Post Schedule & Change Orders	Qty	Total Cost Pre-Rebate	Savings/Year
<input checked="" type="checkbox"/> Equip: Remove existing flood light; install 43W LED Flood Light (Atlas FLM43LED or Equivalent) Spec: 5000 °K lamp color temperature		1	\$415.00	
<input checked="" type="checkbox"/> M: From (2) HAL PAR38 100-2L to (2) LED 24E2-2L-SEC-FLOOD, 5000 °K	D/D			\$154.14
PF: LED 24E2-2L-SEC-FLOOD, 5000 °K				
<input checked="" type="checkbox"/> Equip: Remove existing bug-eye security flood; install 24 Watt security flood (RAB Bullet or equivalent) Spec: 5000 °K lamp color temperature		2	\$630.00	
<input checked="" type="checkbox"/> M: From (1) HPS 150M1-1L to (1) LED 50E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTOR5ARL-PC or equivalent)	D/D			\$60.48
EF: HPS 150M1-1L				
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		1	\$11.00	
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		1	\$6.00	
PF: LED 50E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTOR5ARL-PC or equivalent)				
<input checked="" type="checkbox"/> Equip: Remove existing exterior fixture; install 50 Watt LED fixture (Lumark XTOR5ARL-PC or equivalent) Spec: 5000 °K lamp color temperature		1	\$340.00	
<input checked="" type="checkbox"/> Area Y2: Exterior North				
<input checked="" type="checkbox"/> M: From (3) CFL QD 26S2-2L to (3) LED 20E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTORIA2A or equiv.)	D/D			\$119.07
EF: CFL QD 26S2-2L				
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		3	\$18.00	
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		3	\$33.00	
PF: LED 20E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTORIA2A or equiv.)				
<input checked="" type="checkbox"/> Equip: Remove Existing Wallpack fixture; Install 20 watt LED wallpack (Lumark XTORIA2A or equiv.) Spec: 5000 °K lamp color temperature		3	\$870.00	
<input checked="" type="checkbox"/> Area Y3: Exterior West				
<input checked="" type="checkbox"/> M: From (2) CFL QD 26S2-2L to (2) LED 20E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTORIA2A or equiv.)	D/D			\$79.38
EF: CFL QD 26S2-2L				
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		2	\$12.00	
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		2	\$22.00	
PF: LED 20E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTORIA2A or equiv.)				
<input checked="" type="checkbox"/> Equip: Remove Existing Wallpack fixture; Install 20 watt LED wallpack (Lumark XTORIA2A or equiv.) Spec: 5000 °K lamp color temperature		2	\$580.00	
<input checked="" type="checkbox"/> M: From (1) HPS 250M1-1L to (1) LED 30E1-1L-CANOPY, 5000 °K (RAB VANLED30-PC or equivalent)	D/D			\$228.48
*** Fixture located at main entrance EF: HPS 250M1-1L				
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		1	\$11.00	
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		1	\$6.00	
PF: LED 30E1-1L-CANOPY, 5000 °K (RAB VANLED30-PC or equivalent)				
<input checked="" type="checkbox"/> Equip: Remove existing Canopy fixture; install 30W LED Canopy Fixture (RAB VANLED30 or equivalent) Spec: 5000 °K lamp color temperature		1	\$390.00	
<input checked="" type="checkbox"/> M: From (2) MH 250M1-1L to (2) LED 50E1-1L-FIXT-POLE MOUNT, 5000 °K (RAB ALED5T52/PCT or Equivalent)	D/D			\$212.94

For help reading this report, see the Abbreviations and Terminology section that follows

<i>Proposed Measures, Equipment, and Specifications</i>	<i>Pre/Post Schedule & Change Orders</i>	<i>Qty</i>	<i>Total Cost Pre-Rebate</i>	<i>Savings/Year</i>
EF: MH 250M1-1L				
<input checked="" type="checkbox"/> Equip: Dispose of 250w HID ballast: MV, MH, HPS		2	\$22.00	
<input checked="" type="checkbox"/> Equip: Dispose of any HID lamp: MV, MH, HPS		2	\$12.00	
PF: LED 50E1-1L-FIXT-POLE MOUNT, 5000 °K (RAB ALED5T52/PCT or Equivalent)				
<input checked="" type="checkbox"/> Equip: Remove existing exterior fixture; install 50 watt LED fixture (RAB ALED5T52/PCT or Equivalent)		2	\$1,100.00	
Spec: 5000 °K lamp color temperature				

California consumers are not obligated to purchase any full fee service or other service not funded by this program. Los consumidores en California no están obligados a comprar servicios completos o adicionales que no esten cubiertos bajo este programa.

For help reading this report, see the Abbreviations and Terminology section that follows

Schedules (hours per day)

Schedule Name	Hours/ Week	Hours/ Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun
A: 9am-5pm, M-F	40.00	2,086	8.00	8.00	8.00	8.00	8.00	0.00	0.00
B: 24/7	168.00	8,760	24.00	24.00	24.00	24.00	24.00	24.00	24.00
C: 2 hours/day, M-F	10.00	521	2.00	2.00	2.00	2.00	2.00	0.00	0.00
D: Dusk to Dawn	78.75	4,106	11.25	11.25	11.25	11.25	11.25	11.25	11.25
E: 3 hrs/day;M-F	15.00	782	3.00	3.00	3.00	3.00	3.00	0.00	0.00

Abbreviations and Terminology used in this Report:

- **M** = Measure; **EF** or **PF** = Existing or Proposed Fixture; **Equip** = Equipment to be installed; **Spec** = Specification (such as lamp base type or color temperature, see below); **CO** = Change Order, followed by number; *** = Notes
- **INC** = Incandescent, the typical inefficient old-style light bulb.
- **CFL** = Compact Fluorescent Lamp, typically a screw-in fluorescent lamp with miniature straight or twisted tubes that replaces an incandescent. These come in a variety of shapes and sizes, including candle, globe, pear, track, and reflector.
- **T12** = Tubular fluorescent, typical of offices and many stores. The number expresses the diameter in eighths of an inch, thus 12/8 = 1.5" diameter, the common size for the old-style, less efficient tube.
- **T8** = Tubular fluorescent, 1" diameter, the new style efficient lamp that can be retrofitted into existing fixtures in conjunction with electronic ballasts to provide better color rendition with flicker-free and hum-free operation.
- **E** = Electronic ballast, which in conjunction with T8 or compact fluorescent lamps will operate more efficiently, quietly, and without lamp flicker. Example: T8 4' 32E2-2L: two 4', 32 watt T8 lamps with an electronic 2-lamp ballast.
- **PREM** = Premium, high efficiency electronic ballast, saves a few more watts than a standard electronic ballast.
- **TAND** = "Tandem"-wired ballast, shared between fixtures; for example, a 4-lamp ballast used for two 2-lamp fixtures.
- **M** = Magnetic ballast, which operates the old-style fluorescent lamps. Even though it's considered energy efficient (in comparison with even older, standard ballasts, which contain PCBs), compared to the newer electronic ballasts it's inefficient, noisy, and makes lamps flicker. Example: T12 4' 40M2-2L: two 4', 40 watt T12 lamps with a magnetic 2-lamp ballast.
- **S** = Standard magnetic ballast with PCBs, which operates the old-style fluorescent lamps. This is the least-efficient ballast with toxic PCBs which are now illegal; there is an extra disposal charge for ballasts with PCBs. Standard ballasts are also noisy and make the lamps flicker.
- **SLIM** = Slimline, a lighting industry name for 8' fluorescent lamps.
- **LPO** = Low Power Output ballast (i.e. low ballast factor), used to reduce the energy consumption and light output of the newer T8 lamps, in order to match existing light levels, or where high light levels are not necessary.
- **NPO** = Normal Power Output ballast (i.e. normal or standard ballast factor), used to match the light output of new standard fluorescent lamps.
- **HPO** = High Power Output ballast (i.e. high ballast factor), used to increase the light output of T8 lamps where more light is needed, or where two T8 lamps might replace 3 or 4 T12 lamps.
- **Color Temperature** = The "warm" or "cool" appearance of a light source, where the lower numbers (in temperature degrees Kelvin) are considered "warm", and the higher numbers "cool". Example: incandescent lighting has a color temp of about 2700°K and is considered very "warm", while typical office "cool white" fluorescent lamps are about 4000°K.
- = Selected: this Area, Measure, Existing Equipment, or Proposed Equipment is included in the lighting project calculations.
- = Deselected: this Area, Measure, Existing Equipment, or Proposed Equipment is not included in the lighting project calculations.

Equipment List

Item #	Code	Equipment, Labor, or Disposal Item	Qty Item	Qty L	Qty B	Equip Cost	Labor Cost	Total Cost
1	SRC008	4' LAMP NON-PCB BALLAST DISPOSAL	241			\$1,414.67	\$0.00	\$1,414.67
2	SRC010	4' LAMP RECYCLED	533			\$533.00	\$0.00	\$533.00
3	SLE004	4' WRAP LENS	1			\$32.33	\$12.93	\$45.26
4	TLED028	FIXT-4'-STRIP-NPO WITH (2) TLED 4' 12W (Philips InstantFit or equiv), 5000 °K	2			\$230.00	\$70.00	\$300.00
5	TLED053	FIXT-4'-WRAP-NPO WITH (2) TLED 4' 12W (Philips InstantFit or equiv), 5000 °K	3			\$384.96	\$140.79	\$525.75
6	MRC003	HID 250W BALLAST DISPOSAL	13			\$143.00	\$0.00	\$143.00
7	MRC002	HID LAMP DISPOSAL	13			\$78.00	\$0.00	\$78.00
8	LWP004	LED 20E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTORIA2A or equiv.)	5			\$1,125.00	\$325.00	\$1,450.00
9	LWF047	LED 24W Flood (RAB BULLET 2X12 Security Floodlight or equiv), 5000 °K	2			\$500.00	\$130.00	\$630.00
10	LWF060	LED 30E1-1L-CANOPY, 5000 °K (RAB VANLED30-PC or equivalent)	1			\$325.00	\$65.00	\$390.00
11	LWP005	LED 30E1-1L-FIXT-WALL-PACK, 5000 °K Lumark (XTOR3ARL-PC or Equiv.)	3			\$840.00	\$195.00	\$1,035.00
12	LWF068	LED 43W Flood (Atlas FLM43LED or equiv), 5000 °K	1			\$350.00	\$65.00	\$415.00
13	LWF035	LED 50E1-1L-FIXT-POLE MOUNT, 5000 °K (RAB ALED5T52/PCT or Equivalent)	2			\$900.00	\$200.00	\$1,100.00
14	LWP014	LED 50E1-1L-FIXT-WALL-PACK, 5000 °K (Lumark XTOR5ARL-PC or equivalent)	1			\$275.00	\$65.00	\$340.00
15	DLED029	LED INT 10E1-1L-A-LAMP	4			\$19.80	\$16.20	\$36.00
16	DLED039	LED INT 16E1-1L BR40	4			\$60.92	\$0.00	\$60.92
17	DLED039	LED INT 16E1-1L BR40, 2700 °K	2			\$30.46	\$0.00	\$30.46
18	TLED098	LED T8 4' 12E2-2L-DRIVER-RETRO, 5000 °K	95			\$6,175.00	\$2,375.00	\$8,550.00
19	TLED010	LED T8 4' 12E2-2L-NPO (RE-LAMP), 5000 °K	6			\$420.00	\$60.00	\$480.00
20	TLED028	LED T8 4' 12E2-2L-NPO-FIXT-4'-STRIP, 5000 °K	3			\$345.00	\$105.00	\$450.00
21	TLED023	LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K	116			\$9,860.00	\$2,900.00	\$12,760.00
22	TLED023	LED T8 4' 12E2-2L-NPO-RETRO, 5000 °K (New 4' WRAP LENS)	1			\$85.00	\$25.00	\$110.00
23	TLED101	LED T8 4' 12E4-4L-DRIVER-RETRO, 5000 °K	21			\$2,205.00	\$840.00	\$3,045.00
24	LIN008	LUMINAIRE BALLAST DISCONNECT	117			\$126.36	\$87.75	\$214.11
Equipment (including sales tax) and Labor Subtotals:						\$26,458.50	\$7,677.67	\$34,136.17
Set Up Fees								\$0.00
Installation Preference: Weekdays								\$0.00
Access Factor: None								\$0.00
Access Factor: High 30% Extra Labor Costs								\$252.00
Ceiling Height Factor: up to 12 feet								\$0.00
Other Costs Subtotal:							\$252.00	
Total Installed Cost:							\$34,388.17	

- **Item cost includes labor, normal disposal costs, and tax.**
- *Item number in table below corresponds to item number above.*
- *Brands & Model #s to be listed in table below after installation.*
- *Qty L = total quantity of lamps in retrofit item (contractor use only).*
- *Qty B = total quantity of ballasts in retrofit item (contractor use only).*

- *Custom = Custom-priced item. Extra costs explained below:*
- *Set-up Fees:* Contractor travel & set-up, materials handling & recycling.
- *Installation Preference:* extra cost for labor outside normal working hours.
- *Access Factor:* extra labor cost for areas with difficult access.
- *Ceiling Height Factor:* extra labor cost for high ceiling installation.

Installed Equipment Brands and Model #s for Customer's Reference

<i>Item#</i>	<i>Lamp Brand</i>	<i>Lamp Model #</i>	<i>Ballast Brand</i>	<i>Ballast Model #</i>	<i>Other Brand</i>	<i>Other Model #</i>
1						
2						
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RCEW Customer Participation Agreement

I, the undersigned, on behalf of the business customer identified below, acknowledge and agree to the following:

Eligibility

I am an electric or natural gas Customer of PG&E with an active meter serviced by PG&E. If I have an existing on-site cogeneration or self generation, the RCEW program will not pay incentives for energy savings that exceed my annual energy usage from PG&E.

Project Completion

I have reviewed the recommendations in the Customer Report and Work Order. I hereby authorize the Redwood Coast Energy Watch of Redwood Coast Energy Authority ("RCEW") to contact a participating licensed contractor ("Installation Contractor") to complete the recommended energy efficiency project. I have obtained any necessary authorization from the landlord or property manager to complete the project. In most cases, the project should be completed within 3 weeks of signing the attached Customer Work Order. Work will occur during a time that is mutually agreeable to both me and the Installation Contractor. Labor for work performed outside of the normal work week will be charged accordingly. I understand that I am responsible for paying my portion of the project costs (total costs minus the Instant Rebate), and that my portion is due to the Installation Contractor upon project completion and receipt of the project invoice. I, as a California consumer, am not obligated to purchase any full fee service or other service not funded by this Program. Los consumidores en California no están obligados a comprar servicios completos o adicionales que no estén cubiertos bajo este programa. Funding for the Program is limited. Instant Rebates will be paid on a first-come, first-served basis until 12/1/2017 or until funds are depleted, whichever occurs first. Rebates are considered taxable income. Prices and rebates subject to change if I delay installation by more than 2 months after contract signing.

Correction of Electrical Code Violations is Not Covered

Although code violation are rarely found, if any code violations are found that affect the completion of the project, I can either opt to (1) have the Installation Contractor stop work and charge me only for completed work, or (2) have the Installation Contractor provide an additional estimate for correcting the code violations. Costs for correcting the code violations are solely my responsibility and are outside the scope of this contract.

Role of Administrators and Contractors, Access Agreement

I will be signing a Customer Work Order contract (attached) with the Installation Contractor for work recommended in the Customer Report and Work Order. In the event of any defect in the work (including equipment and installation), I will look solely to the equipment manufacturer or Installation Contractor and I absolve RCEW and its employees of any liability with respect to the work. I agree to allow RCEW staff and/or external PG&E-approved verifiers access to the facility should external inspection be required for purposes of verification, monitoring, and program evaluation. The rebate is subject to change if any equipment is not found installed as specified. This Program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission. Este programa está financiado por los usuarios de servicios públicos en California bajo la jurisdicción de la Comisión de Servicios Públicos de California.

Estimated Energy Savings

The estimated energy savings quoted in the Customer Report and Work Order are based on the equipment operating schedules that are included in the proposal and an averaged PG&E utility rate. I believe these schedules accurately describe how the equipment is operated at the facility listed in this document. Since many factors contribute to energy use in any facility, and the installed equipment is only one factor, I understand that RCEW and the Installation Contractor assigned to me do not guarantee that a specific level of energy or cost savings will result from the implementation of energy conservation measures funded under this Program.

Life of Product

I understand incentive payments are based on related energy benefits over the life of the product. I agree if 1) I do not provide PG&E with 100% of the related benefits for the life of the product or a period of 5 years, whichever is less, or 2) I cease to be a distribution Customer of PG&E during said time period, then I shall refund a prorated amount of incentive payment(s) to PG&E based on the actual period of time for which I provided the related energy benefits as an electric Customer of PG&E.

"Double Dipping"

I can only use the Redwood Coast Energy Watch rebates to offset costs for the work and equipment specified as part of the project. I will not be able to apply financial incentives offered by another utility, state, or manufacturer program funded by California ratepayers under the auspices of the California Public Utilities Commission towards work or equipment that is covered by this Agreement. I agree not to apply for or receive incentives or services for the project work or equipment from another utility, state, or manufacturer program.

Limitation of PG&E Liability

Neither PG&E nor any of its employees make any warranty, express or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any data, information, method, product or process disclosed in this document and other Program documents (the "disclosed items"). In addition, PG&E and its employees do not represent that use of the disclosed items will not infringe any privately-owned rights, including, but not limited to, patents, trademarks, or copyrights.

Signature of Authorized Business Representative

_____ Date _____

Morgan King

Humboldt State University - Campus Facility

1 Harpst St, Arcata, CA 95521

**Please also sign the
Work Order on the
next page.**

Customer Work Order and Contractor Work Agreement

Customer Work Order

I, the undersigned, on behalf of the business customer identified below, acknowledge and agree to the following:

I hereby authorize the licensed Installation Contractor below to perform work as recommended in the Customer Report and Work Order and to use such labor and material as deemed advisable. I will be invoiced for the Customer Net Cost of \$29,074.39, which is equal to the Total Installed Cost minus the Instant Rebate. Disposal of ballasts with PCBs, if found, may incur an additional charge beyond the Customer Net Cost and will be included in any Change Orders. Payment is due to the Installation Contractor immediately upon completion of the installation, unless otherwise arranged with the Installation Contractor. All goods remain the property of the Installation Contractor until paid in full. Invoices aged over 30 days from date of invoice will become past due and a monthly service charge of 1.5% may be added to any outstanding balance, and may incur legal action.

Warranties

Per the equipment and installation standards of the Redwood Coast Energy Watch, the Installation Contractor will provide me with the following manufacturer warranties:

- Ballasts for tubular fluorescent lamps shall be warranted by the manufacturer for a period of not less than 5 years.
- Tubular and compact fluorescent lamps (CFLs) shall be warranted by the manufacturer for a period of not less than 1 year.
- New fixtures shall be warranted by the manufacturer for a period of not less than 1 year.
- Exit signs shall be warranted by the manufacturer for a period of not less than 10 years.
- Photocells, time clocks, and occupancy sensors shall be warranted by the manufacturer for a period of not less than 3 years."

In addition, the Installation Contractor will warrant the labor portion on all installed products for one year after project completion.

I understand that, after the 1-year contractor labor warranty expires and for any product that is not covered by the above, it is my responsibility to contact the manufacturer of any failed equipment to take advantage of the manufacturer's warranty.

Change Orders

Proposed changes adding more than \$100 to the original estimate must be approved in writing by me before proceeding. It is the responsibility of the Installation Contractor to identify any discrepancies in fixture quantities and any issues affecting retrofit viability prior to or during construction of each space and to notify RCEW staff in writing of any proposed changes in scope. It is also the responsibility of the Installer to notify me of any proposed changes to the scope, and to get my signed approval on the change order provided to the contractor by RCEW staff.

(Please continue to top of next column)

The RCEW Customer Work Order is part of this direct agreement with the Installation Contractor. I agree to sign the forms necessary for the Installation Contractor to receive the rebate funds when the work is complete.

I have read, understood, and accept all of the above terms and conditions; I authorize the work to proceed; and I shall be bound by all of the terms and conditions as ordered by the undersigned and his/her agents.

Signature of Authorized Business Representative

_____ Date _____

Morgan King
Humboldt State University - Campus Facility
1 Harpst St, Arcata, CA 95521

***** CUSTOMER DO NOT WRITE IN THIS BOX*****

Contractor Work Agreement

I, the undersigned, on behalf of the Installation Contractor identified below, acknowledge and agree to the following:

The price and specifications of this bid proposal are satisfactory and are hereby accepted by the Installation Contractor. The cost of the work included in this bid proposal is not to exceed \$34,388.17 unless a customer signed and approved change order is received by the Redwood Coast Energy Watch Administrator. I agree to honor the terms and conditions of the accompanying Customer Work Order.

All work will be completed within 3 weeks of the project start date shown below.

All work will be completed pursuant to the Redwood Coast Energy Watch Manual and Installation Standards. In order for the Redwood Coast Energy Watch to release the project for invoicing, the undersigned will provide to the customer warranty information for all equipment installed, and submit to the Program a completed Project Completion and Acceptance Certificate, including a complete materials list.

Yes, I accept the project, to start on _____

No, I do not accept the project - state reasons below:

Signature of Contractor Representative below:

_____ Date _____

Print name: _____

Company: _____

Address: _____

City, State, Zip: _____



Project Completion and Acceptance Certificate

Contractor and Customer: please read carefully and sign below. By signing this form, you are certifying that the installation is complete and the project is billable. Please remit this certificate to:

Redwood Coast Energy Watch
 Redwood Coast Energy Authority
 633 3rd Street
 Eureka, CA 95501

Tel (707) 269-1700
 Fax (707) 269-1777
www.redwoodenergy.org

CONTRACTOR: PROJECT COMPLETION

Please note: Redwood Coast Energy Authority will not process payment until all approved change orders and a final equipment list, including brands and model #s, have been submitted, and all warranty paperwork has been provided to the customer listed below.

The undersigned certifies that the project was installed according to the proposed RCEW project scope and specifications for the customer listed below. The undersigned also certifies that all applicable permits were obtained and finalized.

Permit Number:

Date Finalized

Signature of Contractor/Foreman/Installer		Date
(print name)		Title
Contracting Company Name Redwood Coast Energy Authority	Address 633 3rd Street	City, State Eureka, CA

CUSTOMER: PROJECT ACCEPTANCE

Please note: DO NOT SIGN this certificate until you are completely satisfied that the Contractor has fulfilled his obligation to you and the work or equipment has been satisfactorily completed. Make sure you have received warranty paperwork for all equipment installed. If you have any concerns, please call RCEW at (707) 269-1700.

The undersigned hereby certifies that all equipment and materials included in the Customer Report and Work Order have been furnished and installed, and that the work has been completed satisfactorily.

The undersigned understands that the Contractor is not an employee or representative of Redwood Coast Energy Authority, and agrees that neither the aforementioned nor the Redwood Coast Energy Watch are in any way liable or responsible for any acts or omissions of Contractor.

Signature of Authorized agent		Date
(print name)		Title
Business Name Humboldt State University - Marine Laboratory	Address 570 Ewing St	City, State Trinidad, CA