



CITY OF BETHEL

COMMUNITY PARKS AND RECREATION COMMITTEE

MONDAY, JUNE 10, 2024, 6:00 PM

LOCATION: 300 CHIEF EDDIE HOFFMAN HIGHWAY, BETHEL, ALASKA

JOIN ZOOM MEETING:

[HTTPS://US06WEB.ZOOM.US/J/89727002271?PWD=BVJWYWFWNWUZEgFSAU80UVZCYWVXQT09](https://us06web.zoom.us/j/89727002271?pwd=BVJWYWFWNWUZEgFSAU80UVZCYWVXQT09)

MEETING ID: 897 2700 2271

PASSCODE: 924366

PHONE NUMBERS: 888 475 4499 US TOLL-FREE

833 548 0276 US TOLL-FREE

833 548 0282 US TOLL-FREE

877 853 5257 US TOLL-FREE

MEMBERS

Brian Lefferts, Chair

Sophie Swope, Council Rep.

Michelle DeWitt

Alternate 2-Vacant

Beverly Hoffman, Vice-Chair

Kathy Hanson

Sean Glasheen, Alternate 1

Jessica Pew

STAFF

Ex-Officos: Jason Spann, Facility Maint. Foreman

Email: pwadmin@cityofbethel.net Phone: 907-543-3110

I. CALL TO ORDER

II. ROLL CALL

III. PEOPLE TO BE HEARD – FIVE MINUTES PER PERSON

- A. Please submit written public comments to pwadmin@cityofbethel.net by 4:00 p.m. the day of the meeting.

IV. APPROVAL OF AGENDA

V. APPROVAL OF MEETING MINUTES

- A. May 13, 2024 Community Parks and Recreation Committee Meeting

VI. UNFINISHED BUSINESS

- A. YK Fitness Center Review Of Fiscal Year Operational Budget's Expenditures, Revenues, Transfers (Lefferts)
- B. Update From HealthFit On The Equitable Access Program Role Out (Lefferts)
- C. Update on the YK Fitness Center Roof (Lefferts)
- D. Consideration of Community Parks and Recreation Department and Draft Budget (Lefferts)
- E. Lifeguard Shortage
- F. Health Fitness Report March 2024
- G. Review of Harbor Park Sign Entries-Vote on Finalists to be Presented for Kids Vote Ballot

VII. NEW BUSINESS

- A. LKSD Swim Team Pool Rental Fees
- B. Community Center Construction Project
- C. Cordova Pool energy Audit Report

Posted <<DATE>> at City Hall, AC Co., Swanson's, and the Post Office.

Ex-Officio Staff

VIII. EX OFFICIO REPORT

- A. April 2024 Health Fitness Report

IX. MEMBER COMMENTS

X. ADJOURNMENT

Posted <<DATE>> at City Hall, AC Co., Swanson's, and the Post Office.

Ex-Officio Staff

City of Bethel, Alaska

Community Parks and Recreation Committee Minutes

May 13, 2024

Regular Meeting

Bethel, Alaska

I. CALL TO ORDER:

A regular Community Parks and Recreation Committee Meeting was held on May 13, 2024 via Zoom.
Beverly Hoffman called the meeting to order at 06:00PM.

II. ROLL CALL:

Comprising a quorum of the committee, the following were present for Roll Call: Soffie Swope, Michelle Dewitt, Jessica Pew, Kathy Hanson. Excused- Brian Lefferts, Sean Glasheen
Also Present: Jason Spann, Carmen Murat, Stacey Reardon

III. PEOPLE TO BE HEARD:

IV. APPROVAL OF AGENDA:

MOVED BY:	Kathy Hanson	Motion to approve agenda.
SECONDED BY:	Sophie Swope	
VOTE ON MOTION	Motion carried by unanimous vote.	

V. APPROVAL OF MINUTES:

MOVED BY:	Kathy Hanson	Motion to approve meeting minutes for
SECONDED BY:	Sophie Swope	
VOTE ON MOTION	Motion carried by unanimous vote.	

VI. UNFINISHED BUSINESS:

- A. YK Fitness Center Review of Fiscal Year Operational Budget's Expenditures, Revenues, Transfers (Lefferts)
- B. Update from HealthFit on the Equitable Access Program Role Out (Lefferts)
- D. Update of the YK Fitness Center Roof (Lefferts)

VII. NEW BUSINESS:

- A. Consideration of Community Parks and Recreation Department and Draft Budget (Lefferts)
- B. Lifeguard Shortage
- C. FY25 Budget Final
- D. Health Fitness Report March 2024
- E. Review of Harbor Park Sign Entries-Vote of Finalists to be Presented for Kids Vote Ballot

VIII. EX OFFICIO MEMBER REPORT:

IX. COMMITTEE MEMBER COMMENTS:

Brian Lefferts: Excused
Sophie Swope: None.
Kathy Hanson: None.
Michelle DeWitt: None.
Sean Glasheen: Excused
Beverly Hoffman: Mone.

X. ADJOURNMENT:

MOVED BY:	Kathy Hanson	Motion to adjourn.
SECONDED BY:	Beverly Hoffman	
VOTE ON MOTION	Motion carried by unanimous vote.	

With no further business, meeting adjourned at 6:37PM.

APPROVED THIS _____ DAY OF _____, 2024.

Beverly Hoffman
Committee Vice-Chair



Carmen Murat
Recorder of Minutes

CITY OF BETHEL
FUND SUMMARY
FOR THE 10 MONTHS ENDING APRIL 30, 2024

YK REG AQUA HLTH & SAFETY CTR

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>REVENUE</u>					
SOURCE 42	.00	.00	100,000.00	100,000.00	.0
SOURCE 43	371,758.00	371,758.00	543,000.00	171,242.00	68.5
TRANSFERS IN	554,873.00	554,873.00	779,829.00	224,956.00	71.2
MISCELLANEOUS	131,749.88	131,749.88	80,000.00	(51,749.88)	164.7
TOTAL FUND REVENUES	1,058,380.88	1,058,380.88	1,502,829.00	444,448.12	70.4
<u>EXPENDITURES</u>					
LOCAL FUNDED EXPENDITURES	868,636.88	868,636.88	1,574,938.05	706,301.17	55.2
TOTAL FUND EXPENDITURES	868,636.88	868,636.88	1,574,938.05	706,301.17	55.2
NET REVENUE OVER EXPENDITURES	189,744.00	189,744.00	(72,109.05)	(261,853.05)	263.1

CITY OF BETHEL
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 10 MONTHS ENDING APRIL 30, 2024

YK REG AQUA HLTH & SAFETY CTR

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>LOCAL FUNDED EXPENDITURES</u>					
400-50-6100 SUPPLIES	(29,413.43)	(6,141.09)	.00	6,141.09	.0
400-50-6150 GASOLINE/DIESEL/OIL	1,377.81	1,597.86	2,000.00	402.14	79.9
400-50-6153 HEATING FUEL	190,789.87	221,278.35	210,000.00	(11,278.35)	105.4
400-50-6155 WATER/SEWER/GARBAGE	29,415.37	40,260.76	56,650.00	16,389.24	71.1
400-50-6160 ELECTRICITY	53,961.61	73,536.86	92,000.00	18,463.14	79.9
400-50-6170 TELEPHONE	1,004.74	1,254.02	1,300.00	45.98	96.5
400-50-6230 VEHICLE MAINT/REPAIR	289.91	289.91	1,000.00	710.09	29.0
400-50-6240 PROP MAINT	19,970.47	25,588.54	55,640.00	30,051.46	46.0
400-50-6241 ICR-PROPERTY MAINTENANCE-5%	1,020.93	1,020.93	50,000.00	48,979.07	2.0
400-50-6320 OTHER PROFESSIONAL FEES	82,366.11	139,669.11	171,909.00	32,239.89	81.3
400-50-6326 CONTRACTOR FEES	(24,810.92)	23,822.19	714,821.00	690,998.81	3.3
400-50-6335 OTHER PURCHASED SERVICES	1,228.44	3,142.78	5,000.00	1,857.22	62.9
400-50-6400 INSURANCE	26,381.57	38,787.47	62,000.00	23,212.53	62.6
400-50-6710 ADMIN OVERHEAD-GF	61,811.22	80,137.50	40,000.00	(40,137.50)	200.3
400-50-6711 ADMIN OVERHEAD-IT SVCS	27,481.38	36,572.27	43,000.00	6,427.73	85.1
400-50-6890 CAPITAL EXPENSE- POOL	.00	.00	20,000.00	20,000.00	.0
400-50-9692 REPAIRS	184,249.70	187,819.42	49,618.05	(138,201.37)	378.5
TOTAL LOCAL FUNDED EXPENDITURES	627,124.78	868,636.88	1,574,938.05	706,301.17	55.2
TOTAL FUND EXPENDITURES	627,124.78	868,636.88	1,574,938.05	706,301.17	55.2
NET REVENUE OVER EXPENDITURES	(627,124.78)	(868,636.88)	(1,574,938.05)	(706,301.17)	(55.2)

Community Development (100-71)		FY20 Actuals	FY21 Actuals	FY22 Budget	FY22 Actuals	FY23 Budget	November FY23 Actuals	FY24 Budget
PERSONNEL:								
	Salaries, Benefits & Taxes excluding EGHB							290,936
6010	Overtime							2,000
6040	Employee Group Health Benefits (EGHB)							153,292
	Total personnel							446,228
MATERIALS, SUPPLIES, & SERVICES:								
6060	Tavel/Training							2,000
6100	Supplies							74,000
6110	Building Maintenance							16,100
6150	Gasoline/Diesel/Oil							2,000
6153	Heating Fuel							210,000
6160	Electricity							92,000
6170	Telephone							1,300
6171	Staff Cellular Phones							800
6200	Minor Equipment							6,000
6230	Vehicle Maint./Repair							1,000
6335	Other Purchase Services							15,000
6400	Insurance							62,000
6430	Allowance for Special Events							2,000
6502	Advertising							2,000
6503	Dues/Subscriptions							1,000
6505	Election Expenses							
6507	Donations & Awards							250
6539	Miscellaneous Expenses							
6700	Indirect Cost Recovery							
6711	Admin Overhead - IT Services							
	Total materials, supplies and services							487,450
	Total operating expenditures							933,678

Community Parks and Recreation								
(100-71)			FY20 Actuals	FY21 Actuals	FY22 Budget	FY22 Actuals	FY23 Budget	November FY23 Actuals
PERSONNEL:								
MI		Community Parks and Recreation Director						90,292
		Administrative Assistant- Aquatics						45,926
		Administrative Assistant Parks and Recreation						45,926
		Part Time Lifeguard (14 hours per week)						13,599
		Part Time Lifeguard (14 hours per week)						13,599
		Part Time Lifeguard (14 hours per week)						13,599
		Part Time Lifeguard (14 hours per week)						13,599
		Part Time Lifeguard (14 hours per week)						13,599
		Part Time Admin (14 hours per week)						13,599
		Part Time Admin (14 hours per week)						13,599
		Part Time Admin (14 hours per week)						13,599
	6000	SALARIES AND WAGES						290,936
		Merit Increases (Bargaining Unit only)						-
	6010	Overtime						2,000
		Subtotal of miscellaneous wages						2,000
		TOTAL GROSS WAGES						292,936
	6023	Leave Cashout: (TW*5%) of FTEs (FTE=3)						9,107
	6031	Medicare: 1.45% of Total Wages						4,248
	6032	Unemployment Insurance: 1.78%*TW (W/ \$39,900 cap)						5,214
	6033	Workers' Compensation: (TW/100)*2.5833						7,567
	6034	PERS Contributions: TW*22%						40,072
	6040	Employee Group Benefits: (2119*12)*FTE (FTE=3)						76,284
	6041	Utility Benefit: (380*12)*FTE (FTE=3)						10,800
		BENEFITS AND TAXES						153,292
		TOTAL PERSONNEL						446,228

Facility Operating Hours				
Jan - Dec (52 weeks)	Daily	Daily Total	Week Total	Period Total
Monday-Friday	5:30a-9	15.5	77.5	4030
Saturday	10a-9p	11	11	572
Sunday	2p-9p	7	7	273
7 days a week			95.5	4875
<i>If the facility is closed Thursdays</i>			80	4069

Pool Lifeguard Hours				
Sept-May (39 weeks)	On Duty	Daily Total	Week Total	Period Total
Monday-Friday	3-9	6	30	1170
Saturday	10a-9p	11	11	429
Sunday	2-9p	7	7	273
Seven Days a week			48	1872
<i>If the facility is closed Thursdays</i>			42	1638
June - Aug (13 Weeks)	On Duty	Daily Total	Week Total	Period Total
Monday-Friday	10a-9p	11	55	715
Saturday	10a-9p	11	11	143
Sunday	2-9p	7	7	91
Seven days a week			73	949
<i>If the facility is closed Thursdays</i>			62	871
Annual Total Lifeguard Hours			54.25	2821
Min. Number of Lifeguards Needed			3.875	

A min of one lifeguard on duty per 25 swimmers. The above totals represent one lifeguard on duty.
 Winter weekday adult swim from 5:30-3:00p no lifeguard on duty.
 Summer weekday adult swim from 5:30-10a no lifeguard on duty.

ity at a time.

Schedule, Events, and Programs

Visit ykfitness.org for the most up to date schedules and information.

Spring classes included Belly dance classes and swim lessons.



GROUP SWIM LESSONS				
March 18th - May 12th, 2024				
AGE*	CLASS	Days/Times**	REQUIREMENTS/NOTES & EQUIPMENT	Price (30 min)
4-6 years	Preschool 1	Sundays 12:00-1:00pm with Buoy	Swimmers entering this pool must be at least 4 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
	Preschool 2	Sundays 1:00-2:00pm with Buoy	Swimmers entering this pool must be at least 4 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
6-10 years	Level 1	Tuesdays 6:00pm-7:30pm with Buoy	Swimmers entering this pool must be at least 6 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
	Level 2	Tuesdays 7:30pm-9:00pm with Buoy	Swimmers entering this pool must be at least 6 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
11-15 years	Level 3	Tuesdays 6:00pm-7:30pm with Buoy	Swimmers entering this pool must be at least 11 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
	Level 4	Tuesdays 7:30pm-9:00pm with Buoy	Swimmers entering this pool must be at least 11 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
16+	Adolescent 1	Tuesdays 6:00pm-7:30pm with Buoy	Swimmers entering this pool must be at least 16 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20
16+	Adolescent 2	Tuesdays 7:30pm-9:00pm with Buoy	Swimmers entering this pool must be at least 16 years old on the first day of class. Swimmers must be able to swim at least 100 yards and be able to follow instructions. Swimmers must be able to follow instructions. Swimmers must be able to follow instructions.	\$20

Upcoming

We are actively working on boosting staff for all operations positions, particularly Lifeguards. In February we lost our two full time Lifeguards and that has made it very difficult to offer recreational swim hours for youth. We are offering Lifeguard training and Swim Instructor Training in April.

YK Fitness Center
NOW HIRING
Full Time, Part Time, Seasonal

Operations Staff
Aquatic Manager
Lifeguards: Full Time
Facility Attendant

Youth Programs Staff
Healthy Activities Club Leaders
Spring Break and Summer

Program Staff
Group Fitness Instructors
Swimming Instructors
Instructional Class Leaders

Apply online
ykfitness.org/employment

Now Hiring Swim Instructors
Free Training: April 26th - May 12th
Fridays 6pm-9pm & Sundays 12pm-8pm
Visit ykfitness.org/certifications for details and to register
Informational Meeting on Fri, 4/19 at 6pm
Yukon-Kuskokwim Fitness Center
267 Akiachak Bethel, AK 99559
www.ykfitness.org (907) 543-0390

Now Hiring Lifeguards
Full and Part Time Positions Available
Free Training & Certification Course:
April 27 - May 11
Saturdays 11am-8pm
Get ready for training with our practice sessions:
Tuesdays 4/16 & 4/23 at 7pm, or Sunday, 4/21 at 6:30pm
www.ykfitness.org (907) 543-0390
267 Akiachak Dr Bethel, AK 99559

JOIN OUR HEALTHY ACTIVITIES CLUB TEAM

Qualifications:
Creative
Love working with kids
Motivated

Positions Available:
Program Coordinator
Program Leaders

Application Deadline May 17th
Summer Staff Training Begins May 28th
Apply online! ykfitness.org/employment

Ongoing

The Lifesavers Foundation continues to sponsor Free Teen Wednesdays and Half Price Saturdays. New in January, the Lifesavers began sponsoring Free Fridays for Seniors/Elders (age 60+).

SENIORS SWIM FREE ON FRIDAYS!
SPONSORED BY THE YK DELTA LIFESAVERS
OPEN TO ALL AGE 60+
FREE POOL ADMISSION ALL DAY ON FRIDAYS
YKFITNESS.ORG 907-543-0390

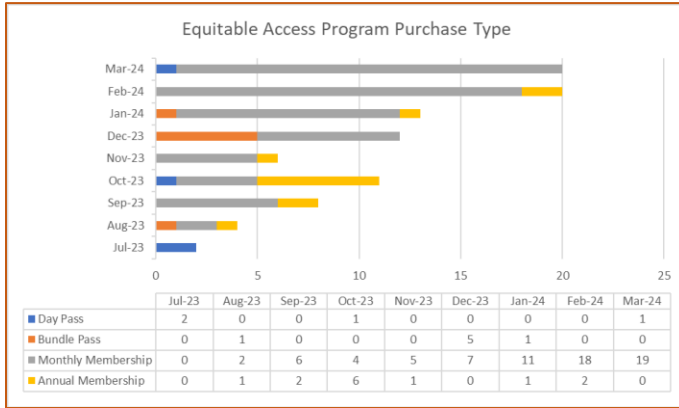
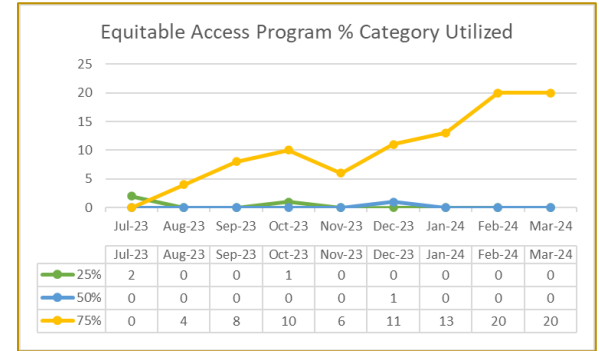
WEDNESDAYS TEENS SWIM FREE!
AGES 13-17 2PM-8PM
YKFITNESS.ORG 907-543-0390

1/2 PRICE POOL ADMISSIONS
SPONSORED BY THE YK DELTA LIFESAVERS FOUNDATION
SATURDAYS 10AM-8PM
FOR MORE INFORMATION OR TO DONATE TO THE LIFESAVERS FOUNDATION VISIT YKFITNESS.ORG OR 543-0390

Equitable Access Program

We continue to offer the Equitable Access Program to provide discounted access to the facility for community members who may not be able to afford the full cost of facility access. Utilization of the Equitable Access Program has been growing slowly, but steadily since implementation, but plateaued in March.

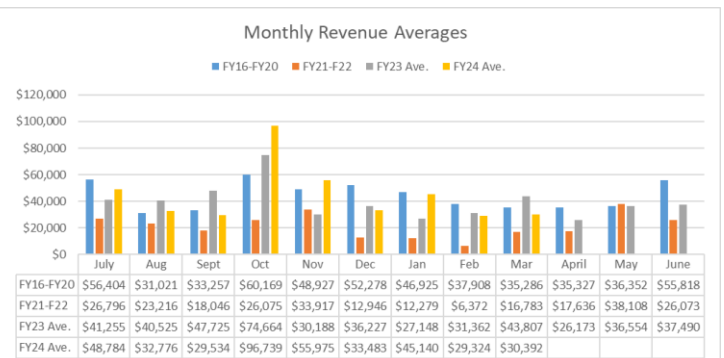
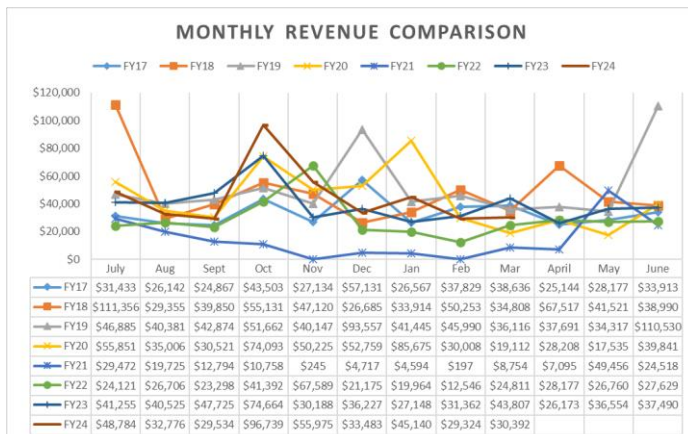
The table to the right shows the total number of purchases made per month utilizing each of the discount categories available. By far the bulk of purchases are under the 75% category.



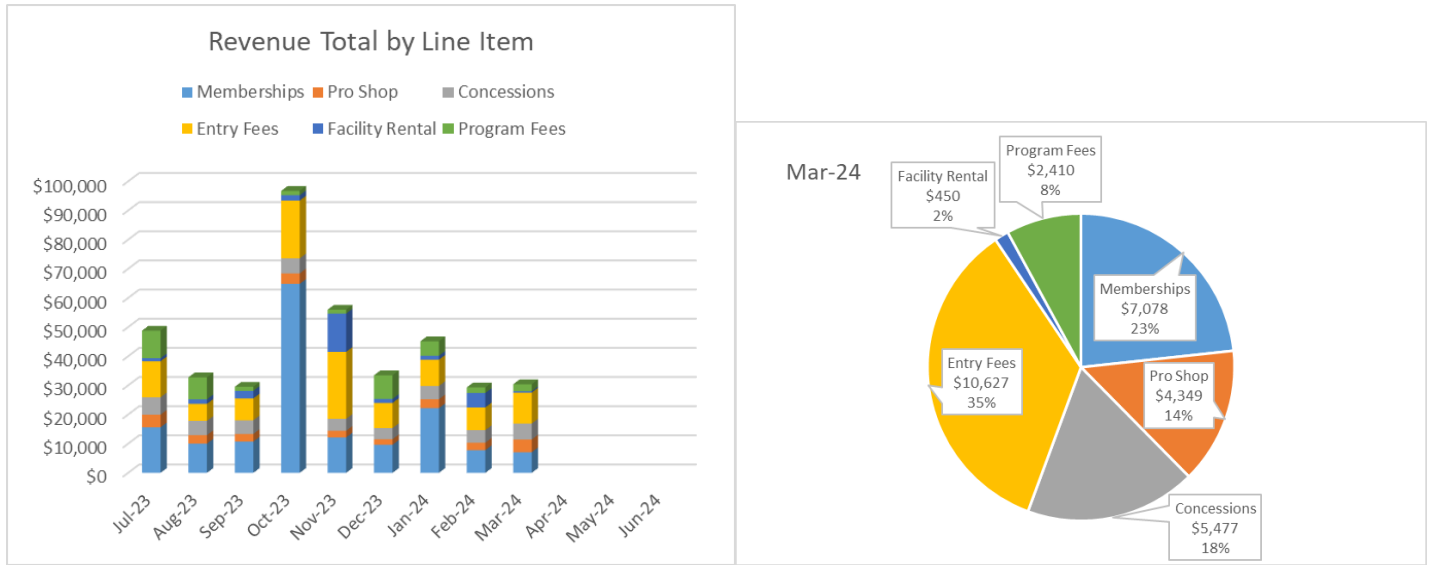
The table to the left shows the types of purchases made by individuals utilizing the EAP. There was a boost in Annual Membership purchases during PFD Season and an overall drop off of purchasing during November, which we commonly see after PFD season. Purchasing has slowly increased from December 2023 – February 2024 in part due to increased marketing of the program. The most common purchases are monthly memberships.

Revenue

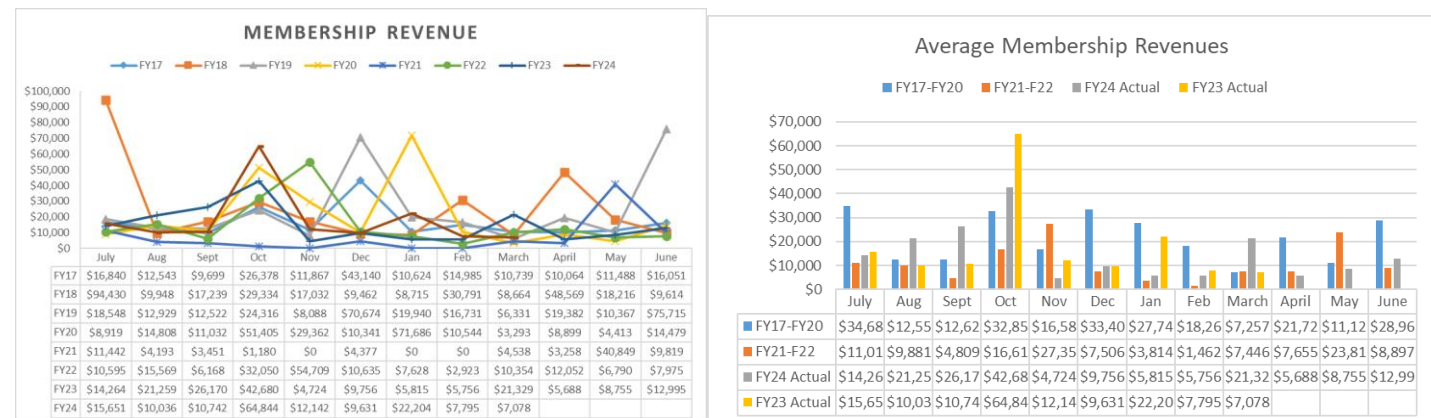
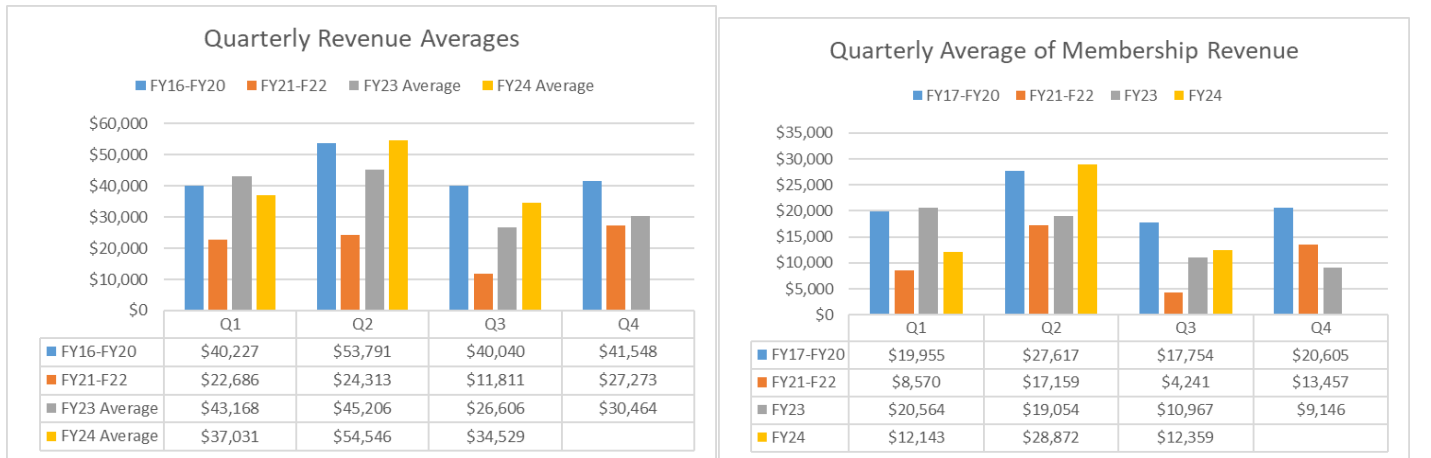
Code	Facility Revenue	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Total	FY24 Budgeted	%attained
43-9420	Memberships	\$15,651	\$10,036	\$10,742	\$64,844	\$12,142	\$9,631	\$22,204	\$7,795	\$7,078				\$160,122	\$250,000	64%
43-4360	Pro Shop	\$4,327	\$2,904	\$2,602	\$3,597	\$2,298	\$1,890	\$3,040	\$2,551	\$4,349				\$27,559	\$42,000	66%
43-4361	Concessions	\$5,963	\$4,901	\$4,695	\$5,158	\$4,094	\$3,848	\$4,569	\$4,307	\$5,477				\$43,012	\$60,000	72%
43-4362	Entry Fees	\$12,345	\$5,816	\$7,491	\$19,828	\$22,976	\$8,600	\$9,004	\$7,788	\$10,627				\$104,474	\$115,000	91%
43-4440	Facility Rental	\$1,065	\$1,583	\$2,613	\$1,830	\$13,135	\$1,370	\$1,361	\$4,964	\$450				\$28,370	\$26,000	109%
43-4369	Program Fees	\$9,434	\$7,538	\$1,391	\$1,482	\$1,329	\$8,145	\$4,962	\$1,919	\$2,410				\$38,609	\$50,000	77%
Misc (Grants, Donations, Etc.)														\$0	\$0	
Facility Revenue Total		\$48,784	\$32,776	\$29,534	\$96,739	\$55,975	\$33,483	\$45,140	\$29,324	\$30,392	\$0	\$0	\$0	\$402,147	\$543,000	74%

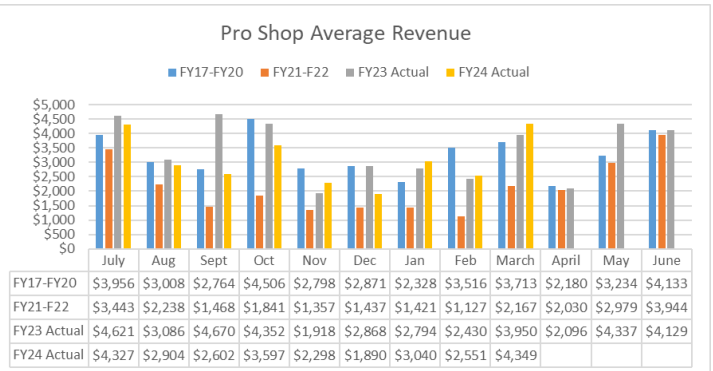
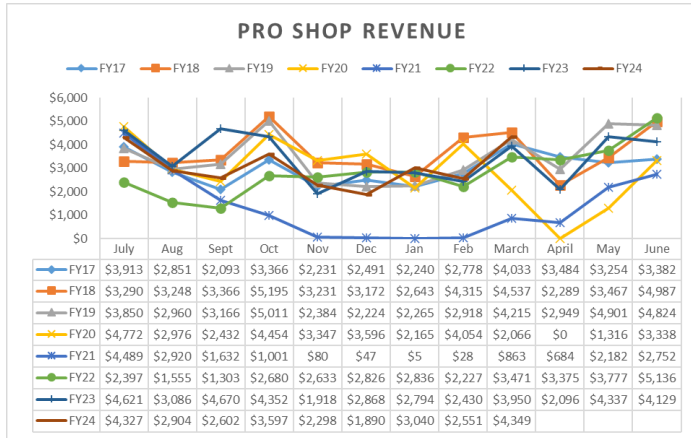


Revenue Comparisons by line Item: Facility access fees (memberships and passes) constitute the bulk of revenue.

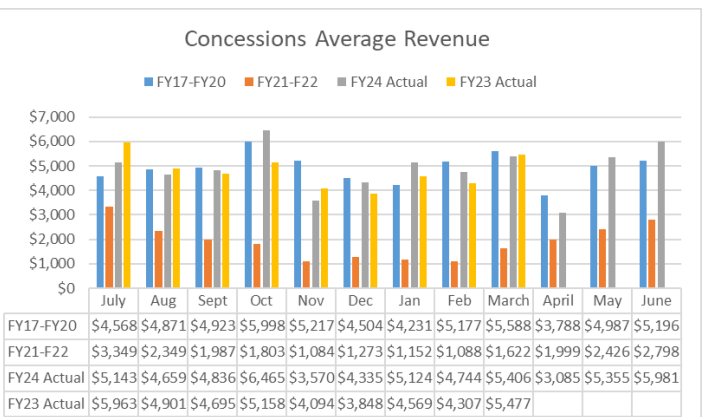
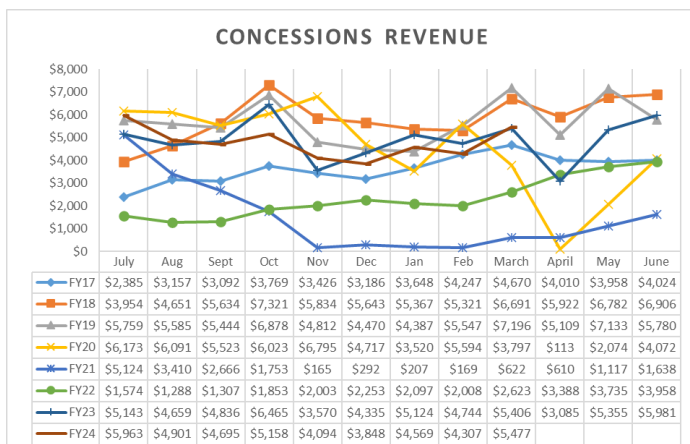
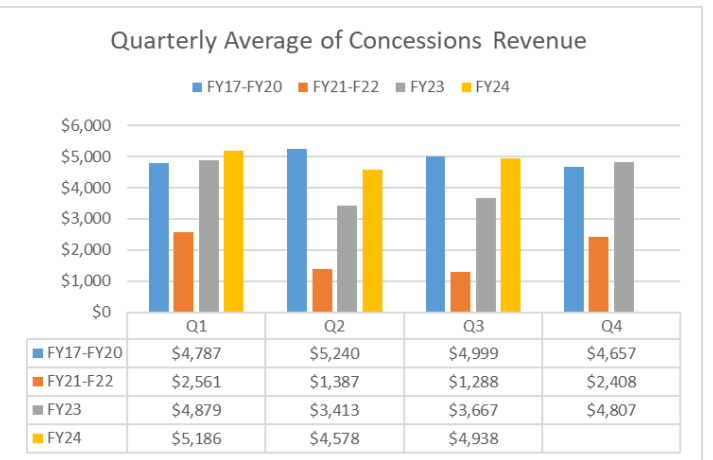
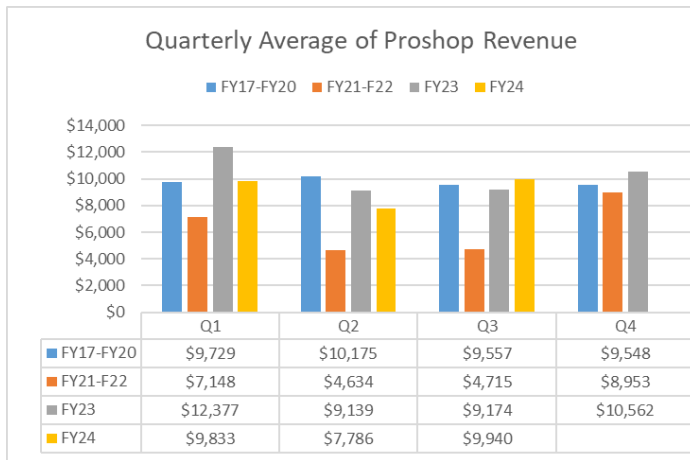


Quarterly Revenues continued to grow past Covid averages, but have not yet reached pre-covid averages due mainly to staff shortages leading to reduced availability of programs and services.

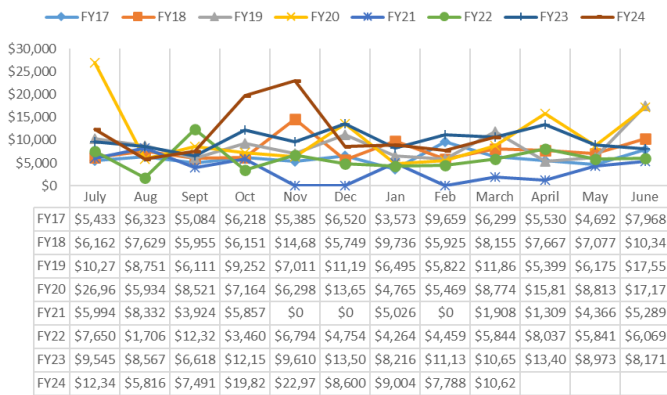




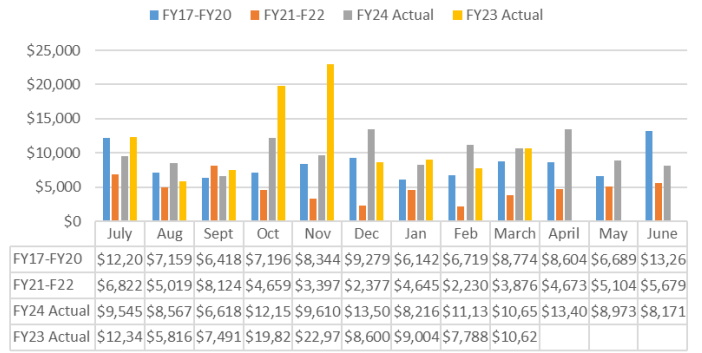
Q3 revenues for the Proshop and Concessions purchases were close to/slightly over pre-covid averages. This is in part due to increased prices resulting from increases in purchase costs, so likely will not result in a gross increase in revenue.



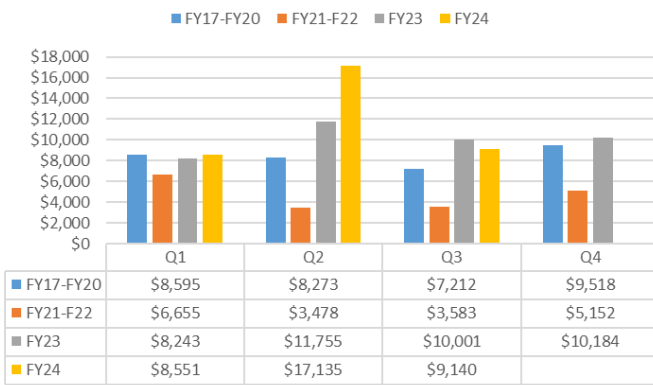
DAILY ENTRY FEES



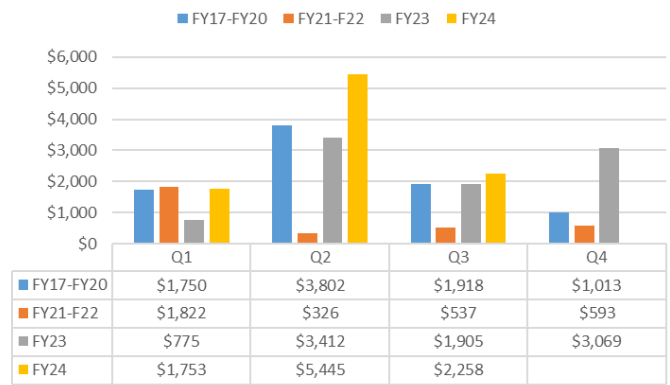
Daily Entry Fees Average Revenue



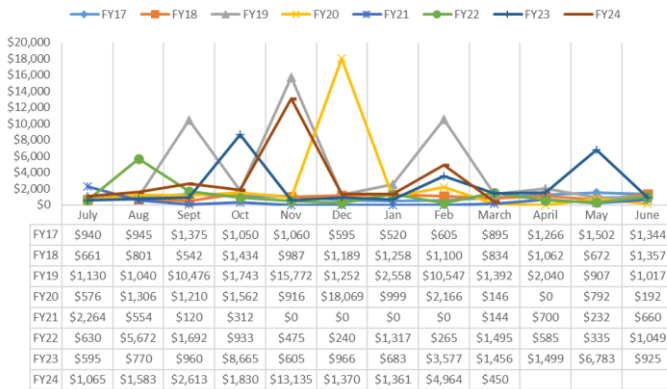
Quarterly Average of Daily Entry Revenue



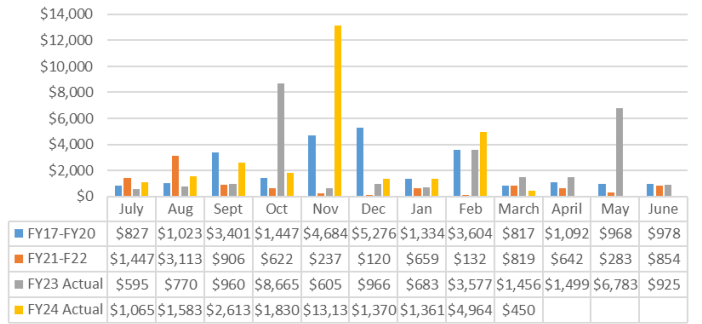
Quarterly Average of Rental Revenue

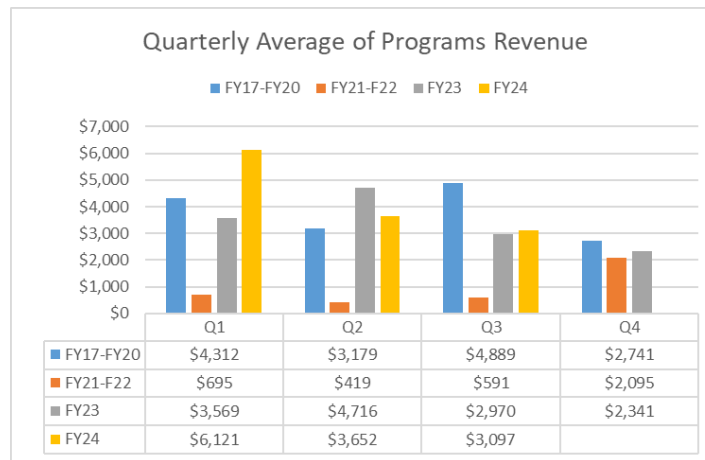
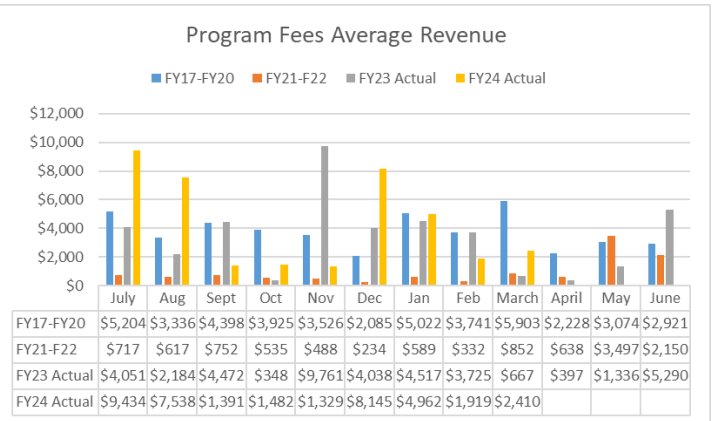
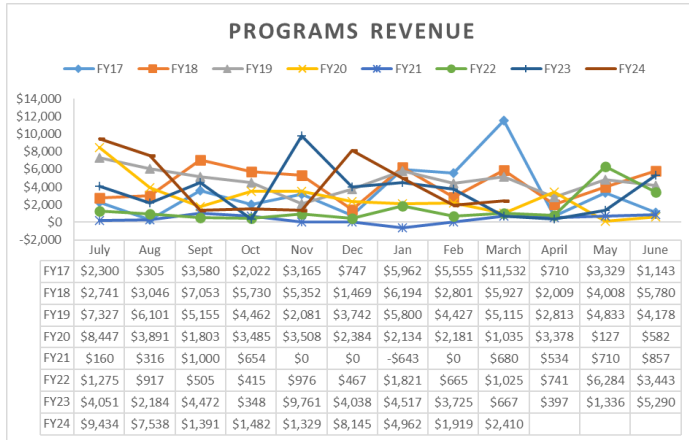


FACILITY RENTALS



Average Revenue: Rental Fees





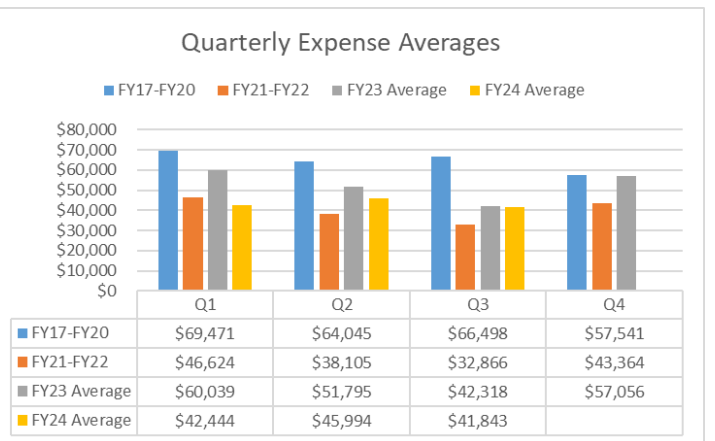
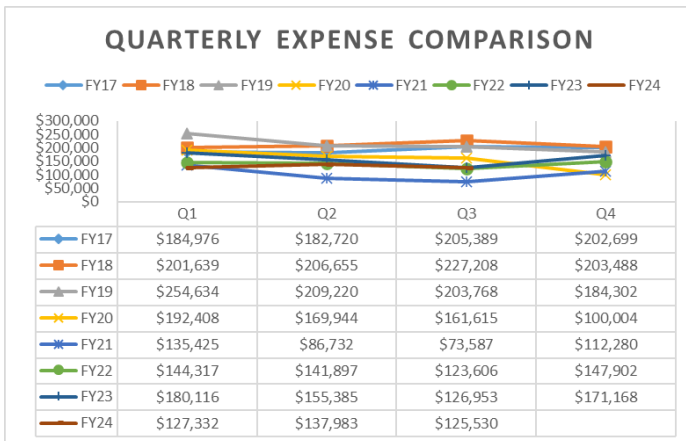
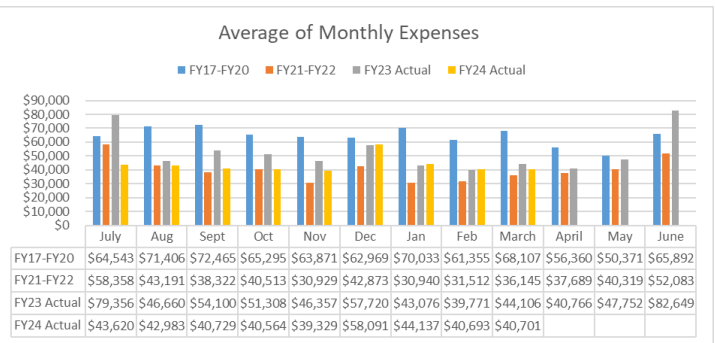
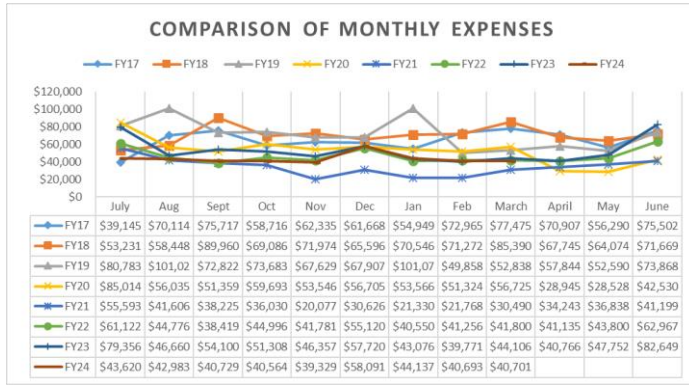
Expenses

We continue to strive to minimize facility expenses while providing necessary safety and resources.

Expenses	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Total	Budgeted	% used
Wages & Benefits	\$37,934	\$37,727	\$35,473	\$33,975	\$33,989	\$53,210	\$37,966	\$35,853	\$36,585	\$342,711	\$609,921	56.19%
Travel/Training	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000	0.00%
Supplies	\$2,408	\$2,695	\$3,804	\$2,675	\$2,178	\$1,729	\$3,348	\$3,312	\$2,362	\$24,511	\$74,000	33.12%
Building Maintenance	\$565	\$705	\$220	\$356	\$1,313	\$1,901	\$473	\$380	\$467	\$6,381	\$16,100	39.63%
Software Licenses	\$511	\$345	\$312	\$1,201	\$833	\$347	\$551	\$330	\$318	\$4,749	\$500	949.79%
General Expenses	\$1,559	\$933	\$839	\$2,356	\$1,016	\$904	\$1,577	\$818	\$969	\$10,972	\$10,300	106.52%
Allowance for Special Events	\$0	\$186	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$186	\$1,000	18.65%
Unforeseen	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000	0.00%
Non Budgeted/Grant Funded	\$642	\$392	\$80	\$0	\$0	\$0	\$221	\$0	\$0	\$1,335		
TOTAL	\$43,620	\$42,983	\$40,729	\$40,564	\$39,329	\$58,091	\$44,137	\$40,693	\$40,701	\$390,846	\$715,821	54.60%

* Due to our 2 week pay period structure there are 2 months out of each year where 3 pay periods fall, skewing wage totals upwards for those months.

**Expense totals do not include purchases made by City of Bethel Property Maintenance or other direct city expenses.



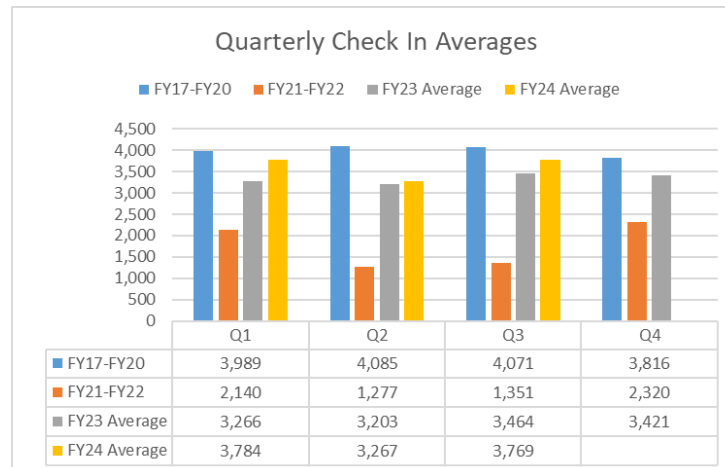
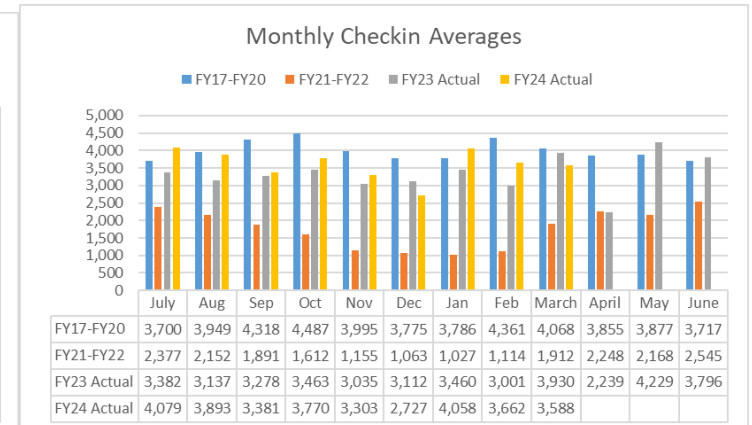
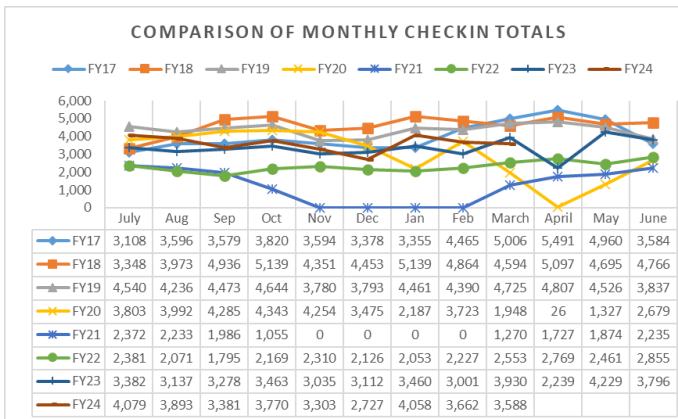
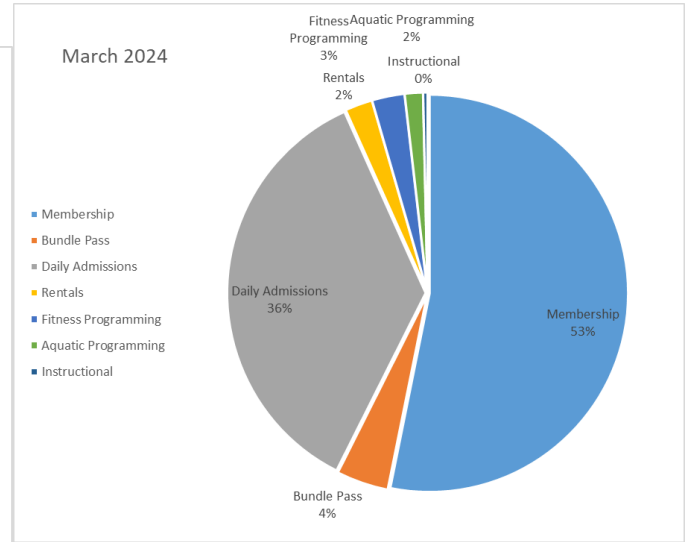
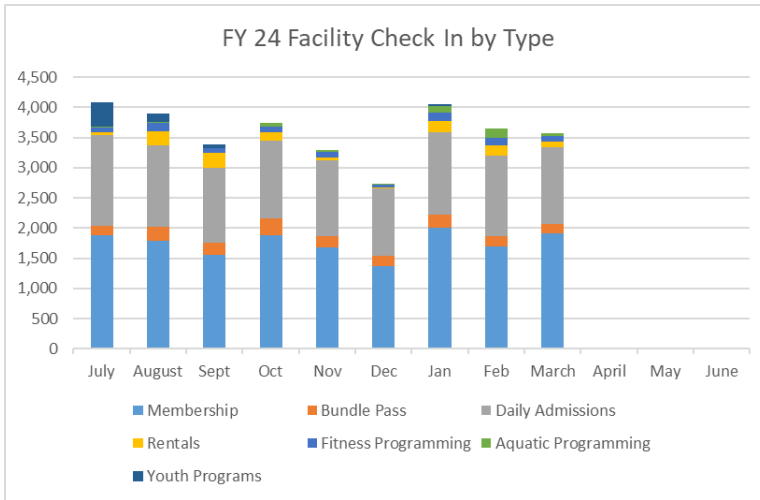
Facility Utilization

The Below Facility utilization numbers represent the total number of patrons who visited the facility over the course of the month based on the number of check -ins by members and bundle pass holders, the number of daily passes sold, and the number of participants who checked in for programs, activities, rentals, and events.

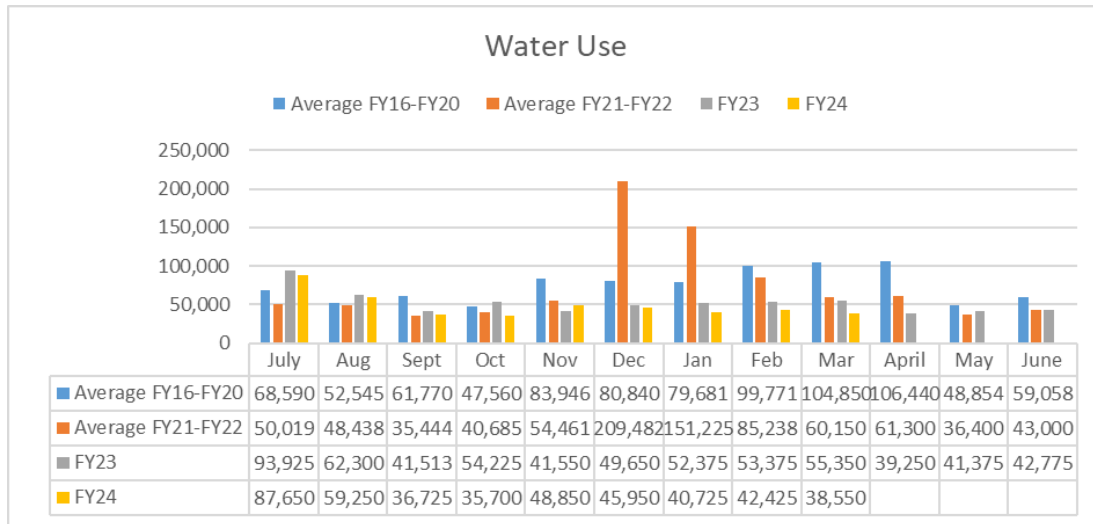
These numbers represent facility visits, not individuals, as most individuals visit multiple times per month.

Facility Check-In FY24	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Total
Membership	1,880	1,794	1,560	1874	1682	1368	2003	1700	1,908				15,769
Bundle Pass	151	220	195	289	180	166	224	160	152				1,737
Daily Admissions	1,515	1,354	1,237	1284	1263	1118	1366	1346	1,287				11,770
Rentals	49	232	248	144	44	14	179	170	80				1,160
Fitness Programming	69	143	92	86	88	58	136	126	95				893
Aquatic Programming	15	18	0	69	36	3	112	150	53				456
Instructional	0	0	0	24	10	0	6	10	13				63
Youth Programs	400	132	49	0	0	0	32						613
Monthly Totals	4,079	3,893	3,381	3,770	3,303	2,727	4,058	3,662	3,588	0	0	0	32,461

Facility utilization for February included an increase in program participation with the offering of increased swim lessons and the addition of personal training. February also saw a decrease in member and bundle pass use.



Water Use



*Note: Facility opened in November of 2014 (FY15). Starting during maintenance closure in Dec 2019/Jan 2020 hot water has been used to keep pipes from freezing resulting in higher-than-normal usage. Water was turned off in late March 2020 once outside temperatures were consistently above freezing temperatures. Problems again arose in Dec 2020 and water was used to assure there were no freeze ups of facility piping through early March 2021.

Community Center Construction

Requests for Action-Community Parks and Recreation Committee

- Provide feedback on the Additional Design Inclusions
- Identify two Committee Members to represent the Committee during the design planning process.

On April 17, 2024, the City received confirmation of a \$9 million award for the City of Bethel Community Center. The Community Center is the expanded idea of the original funding request for a gymnasium which didn't, on its own, fit within the scope of the grant parameters. The City also received \$500,000 from the State of Alaska for the design of the facility.

In addition to the \$9.5 million already awarded, the City requested \$2 million from the Denali Commission, and \$2 million from Congressional Direct Appropriations, through Senator Murkowski's Office.

The Community Center Grant Summary:

The community center will provide free access to the internet, computers, and computer components to residents and visitors. Our residents will have access to on-line educational courses, career development opportunities, telehealth appointments, health monitoring, online commerce, and social networking. Further, the community center will offer the space needed to perform these tasks without distractions or interruptions.

The facility will also host a community gymnasium and access to flexible social spaces providing essential access to inclusive environments that offer youth mentorship and enable peer support networks. The compilation of services offered at the community center will foster a more connected, empowered, and healthier community of Bethel improving community well-being, economic development and workforce development.

Design Minimum Requirements:

- Gymnasium large enough to accommodate numerous indoor sports activities.
 - high school size basketball court (84'x50')
 - three smaller courts crossway-overlap with large court (74'x42')
 - volleyball court overlap with large court (60x30)
- Spectator seating (min. 200 seats)
- Equipment storage (min 30'x30')
- Janitor closet
- Computer lab with at least six desks
- Enclosed office space for telehealth appointments or health consultations.
- General community space for socializing (enclosed and/or open)
- Mounted large screens/audio for group trainings/events
- Video surveillance to provide remote monitoring of the space for facility staff
- Opportunities for expansion of the facility

Additional Design Inclusions Prioritized:

- High school size basketball court(s) (84'x50') with smaller courts crossway
- Running track
- Fitness space

Design Limitations:

The initial design costs were close to \$18 million but included restrooms, locker rooms, a sauna, and multiple auxiliary rooms/spaces. With the limited funding, keeping the design simple and focusing on maximizing the size of the space is our goal. To accomplish this, the design minimum requirements exclude locker rooms and restrooms, fortunately the current facility has enough to meet industry standards for the expected occupancy levels. The grant award also requires the construction to follow the Build America Buy America program. This requirement has significantly driven up costs for other municipal projects and is expected to do the same for this facility.

Since there is potential for an additional \$4 million in funding for this project, DOWL will include notice of additional funding in the RFP.

The City of Bethel Plan of Action:

The funding timeline is short. The City will work closely and quickly with DOWL to develop the Request for Proposals with what *we think* will be a Progressive Design Build construction, detailed more in the DOWL Task Order #67 attached.

- Task 1 – Design-Build Delivery Approach June 2024
- Task 2 – Design-Build Solicitation July-August 2024
- Task 3 – Site Survey Summer 2024
- Task 4 – Geotechnical Services Summer 2024

Construction Design Development Team:

With the fast pace of this project and with progressive design build, the City will meet with contractors often until the design completed. We request the Committee identify design priorities for the facility and select two committee members to represent the committee in the design/construction calls.



Investment Grade, Level 2 Energy Audit Bob Korn Memorial Pool

Owner and Client:
City of Cordova

Site Survey Date:
January 28 & 29, 2016

Audit performed by:
Energy Audits of Alaska
1231 W. Northern Lights Blvd, Suite 807
Anchorage, AK 99503
Contact: Jim Fowler, PE, CEM
jimf@jim-fowler.com

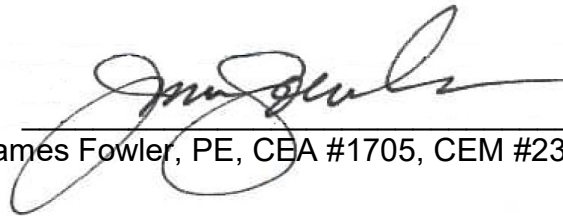
Energy Audits of Alaska 

Project #EEA-CDV-1601

Prepared for:

The City of Cordova

Audit performed by:

A handwritten signature in black ink, appearing to read 'James Fowler', is written over a horizontal line.

James Fowler, PE, CEA #1705, CEM #23110

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Disclaimers

This energy audit is intended to identify and recommend potential areas of energy savings (EEM's), estimate the value of the savings and approximate the costs to implement the recommendations. This audit report is not a design document and no design work is included in the scope of this audit. Any modifications or changes made to a building to realize the savings must be designed and implemented by licensed, experienced professionals in their fields.

Lighting recommendations should all be first analyzed through a thorough lighting analysis to assure that the recommended lighting upgrades will comply with any State of Alaska Statutes as well as Illuminating Engineering Society (IES) recommendations.

Ventilation recommendations should be first analyzed by a qualified and licensed engineer experienced in the design and analysis of pool and natatorium HVAC systems.

Neither the auditor nor Energy Audits of Alaska bears any responsibility for work performed as a result of this report.

Payback periods may vary from those forecasted due to the uncertainty of the final installed design, configuration, equipment selected, and installation costs of recommended EEM's, or the operating schedules and maintenance provided by the owner. Furthermore, EEM's are typically interactive, so implementation of one EEM may impact the cost savings from another EEM. The auditor accepts no liability for financial loss due to EEMs that fail to meet the forecasted savings or payback periods.

This audit meets the criteria of an Investment Grade Audit per the Association of Energy Engineers definition and a Level 2 audit per the ASHRAE definition and is valid for one year. The life of an audit may be extended on a case-by-case basis.

This audit is the property of the client.

AkWarm© is a building energy modeling software developed under contract by the Alaska Housing Finance Corporation (AHFC).

Acknowledgements

A massive amount of very detailed, accurate and relevant information was provided by the Pool Operations Leader, Meghan Shinella, in a very timely manner. Information included electric and oil consumption and cost data, the Alaska Administrative Code, attendance and occupancy records, operating hours and more. Additionally, she provided details regarding the pool operations, lighting and water meter locations.

Micah Renfeldt from the City of Cordova, provided access to mechanical and fan rooms, as well as pool maintenance and operational information.

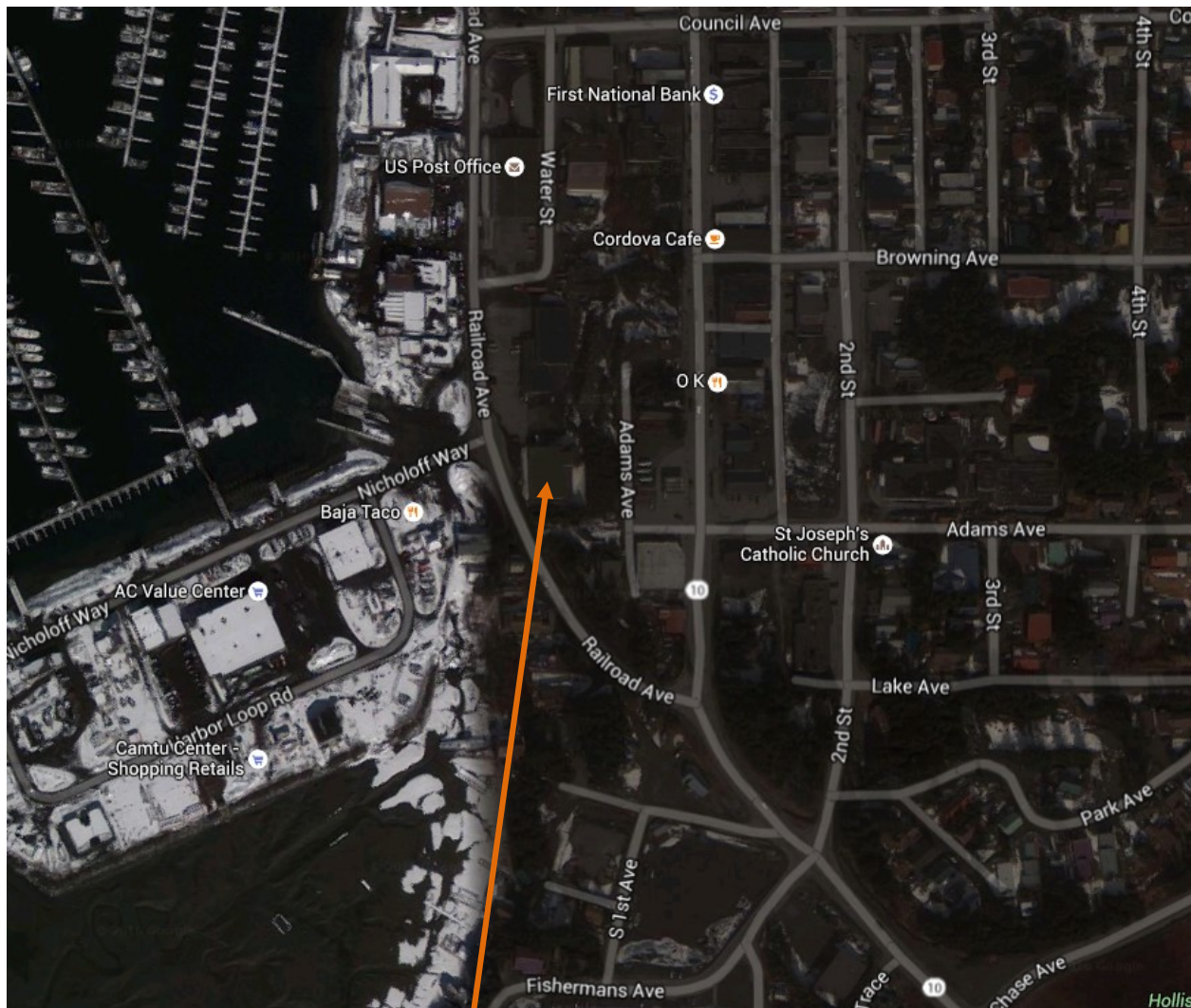
Eagle Contracting provide roof insulation cost estimates.

Aaron Donohue of TMI Aquatics provided electric and efficiency information for the pool systems.

Tim Reynolds of Wescor provided cost estimates and energy calculations for the proposed DesertAire HVAC, de-humidification and heat recovery system.

List of Abbreviations used in this document

A	Amps
AHU	Air Handling Unit
CFL	Compact florescent lamp
CFM	Cubic Feet per Minute
DHW	Domestic Hot Water
ECI	Energy Cost Index
ECM	Energy Conservation Measure (no or low cost), also called O & M recommendations
EEM	Energy Efficiency Measure
EF	Exhaust Fan
EOL	End of Life
EPA	Environmental Protection Agency
EUI	Energy utilization (or use) Index
F	degrees Fahrenheit
Gal	Gallons
gpm	Gallons per minute
HP	Horse Power
HPS	High Pressure Sodium
HID	High Intensity Discharge
HVAC	Heating Ventilation and Air Conditioning
IR	Infra-Red
K	degrees Kelvin
kBTU	1000 BTU
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light emitting diode
MBH	1,000 BTU/hour
MH	Metal Halide
MMBTU	1,000,000 BTU
NG	Natural Gas
O & M	Operations and Maintenance
oc	On Center
ORNL	Oak Ridge National Laboratory
OSA	Outside Air
PIR	Passive Infra-Red
PPM	Parts per million
RA	Return Air
REF	Return Air Fan
ROI	Return on Investment
SA	Supply air
SF	Square feet or Square foot
SIR	Savings to Investment Ratio
w	Watt
WC	Water Closet (toilet)

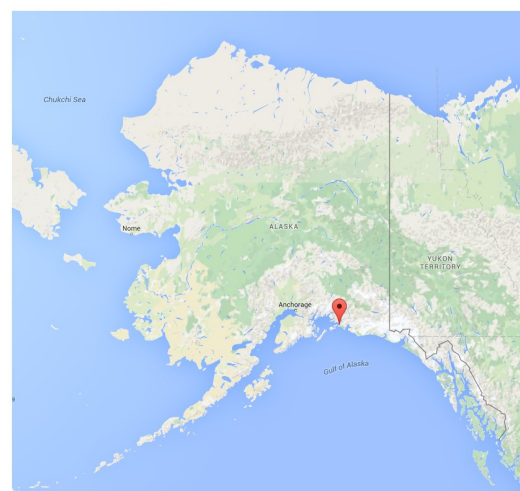


NORTH

Subject Building

The Bob Korn Memorial Pool
609 Railroad Ave
Cordova, AK 99

Building contact:
Meghan Schinella
Pool Operations Leader
907-424-7200
pool@cityofcordova.net



1. EXECUTIVE SUMMARY

This energy audit of the subject building included an analysis of its shell, interior and exterior lighting systems, HVAC systems, large motors, plug loads and pool operating system. Water consumption by plumbing fixtures was also evaluated.

This is an Investment Grade Audit, also called an IGA. An IGA is defined as a technical and economic analysis of potential energy saving projects in a facility. The analysis must provide information on current energy consuming equipment, identify technically and economically feasible EEM's for existing equipment and provide the client with sufficient information to judge the technical and economic feasibility of the recommended EEM's. The ECM's identified in this audit, although they have the potential to save significant consumption and cost, are not part of the technical and economic analysis. The "avoided costs" resulting from ECM's are calculated and shown in Section 1.7, but are not included in the cost and savings calculations in this audit.

1.1 Guidance to the Reader

The 12 page Executive Summary is designed to contain all the information the building owner/operator should need to determine which energy improvements should be implemented, approximately how much they will cost and their estimated annual savings. The Executive Summary discusses the subject building and provides a summary table with the overall savings, costs and payback for all recommended EEM's and ECM's for the facility covered in this audit.

Sections 2, 3 and 4 of this report and the Appendices, are back-up and provide much more detailed information should the owner/operator, or their staff, desire to investigate further. Appendix H contains samples of the equipment recommended in the EEM's.

Issues that the auditor feels are of particular importance to the reader are underlined and all abbreviations and acronyms used in this document are listed on Page 5.

1.2 Summary

A summary of the recommended EEM's and their associated costs and overall payback:

Total Savings	\$ 30,331
Total Costs	\$ 305,795
Payback	10.1 yrs

The fuel oil portion of these savings (\$18,755) is based on a price per gallon of \$2.99, which is very low considering the historical cost of fuel in rural Alaska, but this is the average cost paid for fuel in 2015 by the City of Cordova. At a fuel cost of \$4.00/gallon, the fuel oil portion of savings from the recommended EEM's increases to \$25,090, the total savings increases to \$35,530 and the payback is reduced from 10.4 years to 8.5 years. The electric portion of these savings is based on a PCE discounted, blended cost of \$.14/kWh.

Noteworthy points:

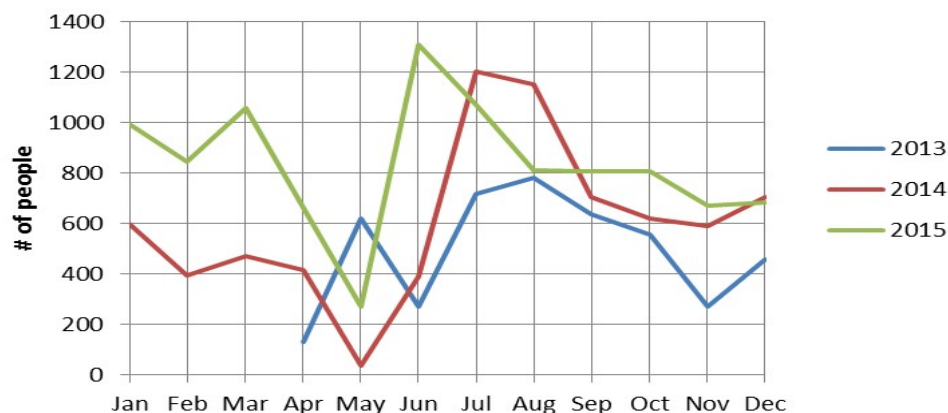
- a. The majority of energy savings in this facility will come from an upgrade to the natatorium ventilation and de-humidification system. The proposed system uses heat recovered from the de-humidification process and air exhaust streams to maintain natatorium space temperature and pool water temperature.

- b. There was a 4,692 gallon (20%) reduction in fuel oil consumption from 2013 to 2014. (which continued in 2015). This is presumed to be a result of either changing the operating conditions of the HVAC system, or a change in the equipment or system operating efficiency¹.
- c. HVAC operational deficiencies observed (more detail provided in Section 3.1):
 - i. The outside air ventilation levels in the Natatorium appear to be below code standards based on visual estimate of the percentage opening of the OSA dampers in AHU-1.
 - ii. The existing HVAC system is not controlling relative humidity (RH) in the natatorium within reasonable limits. The relative humidity (RH) in the natatorium varied from 35% to 70% (See data logging graph in Appendix G). At levels above an RH of 55%, there is danger of damaging the building envelope by allowing moisture laden air into the walls and roof. A mitigating factor in this building, is the fact that two of the three exhaust fans in the clearstory fan room appear to run continually. This fan situation, although inefficient from an energy perspective, will create a negative static pressure in the building which should prevent moisture laden air from getting inside wall and ceiling structures and causing damage. Another effect of this under-ventilation is that the savings calculated from the ventilation EEM's in Table 1.1 are approximately 50% of what they would have been if the natatorium were properly ventilated and a maximum 55% RH was allowed. In other words, half of the potential ventilation savings have already been captured, but at the risk of damaging the building envelope.
- d. Pool deck light levels were measured to be from 19 FC to 29 FC; current code standard is 50 FC.

1.3 Occupancy and Use

The following occupancies and utilizations are based on conditions observed and attendance data provided by onsite staff. Pool operating hours have varied over the last 2 years with a range of 3198 hrs/year to 3640 hrs/year and attendance varies with the time of year as well as year over year as seen in Figure 1.0.

Figure 1.0
Pool Attendance



¹ The high RH in the natatorium mentioned in "HVAC operational deficiencies observed" (Section 1.2, item c.ii) is a very likely cause of the reduction in fuel oil consumption after 2013

The pool operating schedule varies depending on the season, but in general, the pool is open 7 days per week year round. As a most recent schedule example, in February 2016, the pool's operating schedule was from 8:00am-7:15pm on Mondays and Fridays, from 8:00am-7:00pm on Tuesdays through Thursdays, from 10:00am-3:00pm on Saturdays and 11:00am-1:00pm on Sundays.

In addition to its use as a community swimming pool, the facility houses a small office, a small laundry room and locker rooms with showers.

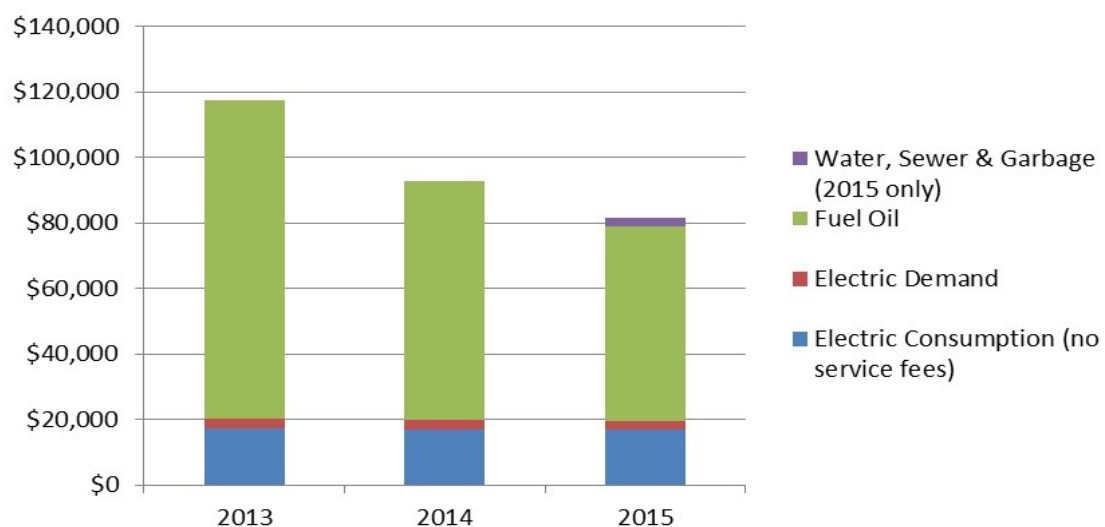
1.4 Overall Energy Consumption and Costs

There is a single electric meter and a single fuel oil tank on the premises. The oil tank is not metered. Electric consumption data from January 2013 through December 2015 was provided by Cordova Electric Cooperative, while electric cost data and fuel oil cost data were provided by the City of Cordova through Meghan Schinella.

Fuel oil costs were provided via an accounting ledger. Only 7 of the 36 months of data provided included gallons of fuel delivered, all others showed only costs. These 7 samples coupled with cost per gallon information from the annual Alaska Fuel Price Report² were used to approximate the number of gallons of oil delivered each month. Raw source data is tabulated and a benchmark analysis on the data is performed in Appendix B.

Figures 1.1, 1.2 and 1.3 summarize energy costs for this facility. Fuel oil, by far, accounts for the largest portion of energy costs. Figure 1.1 seems to indicate that the facility is running more efficiently over each of the last 3 years, as costs between 2013 and 2015 decreased by 33%. But although oil consumption did decrease between 2013 and 2014 (as previously mentioned), Figure 1.3 shows that the cost reduction between 2014 and 2015 is a result of a 16% reduction in the cost of fuel oil during this period. Additional insight is provided in the full benchmark analysis in Appendix B.

Figure 1.1 – Energy Costs
Annual Utility Costs



² Alaska Fuel Price Report: Current Community Conditions, July 2015; Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs

Figure 1.2 – distribution of Utility costs

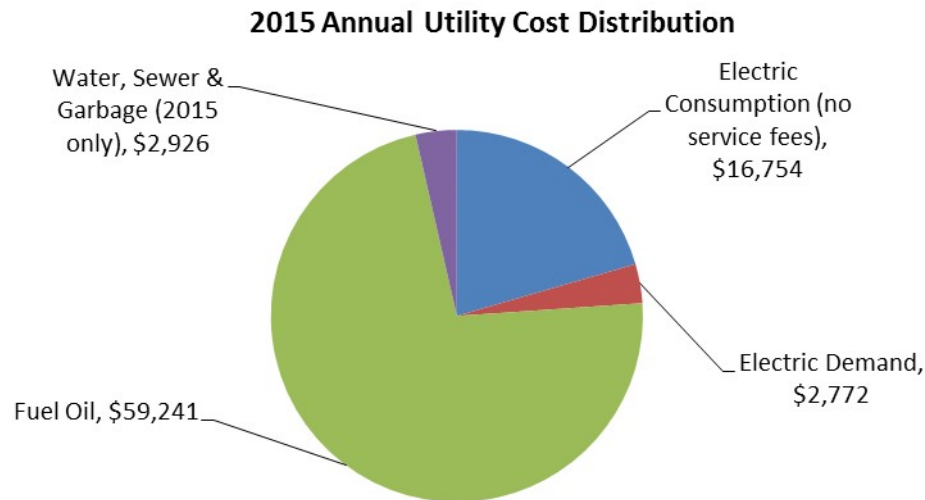
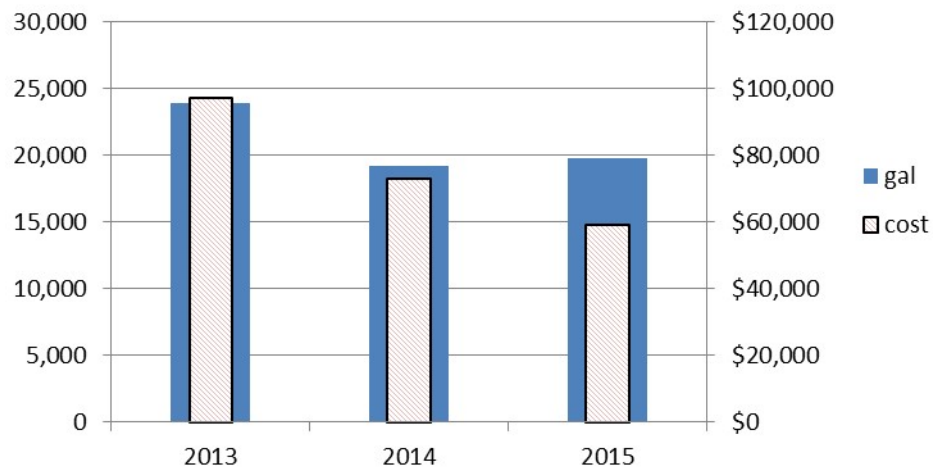


Figure 1.3

Effect of \$/gallon oil cost

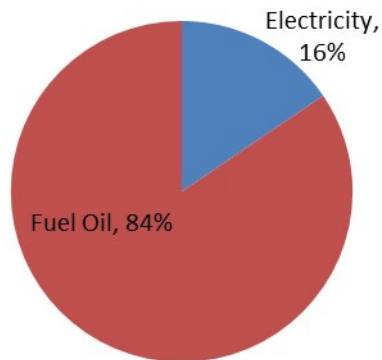
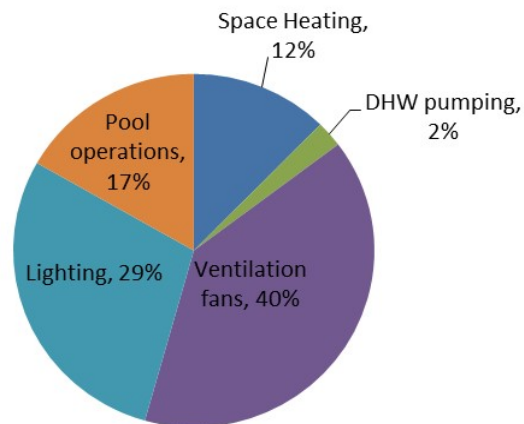


Figures 1.4 and 1.5 show the electric energy consumption and distribution of that consumption, as well as the consumption of fuel oil.

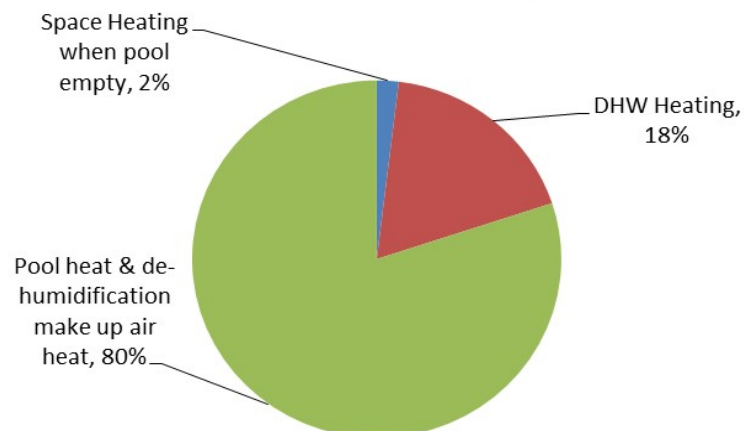
Figure 1.4 – Energy Consumption

2015 Electricity and Fuel Oil				
		Consumption	Cost	Energy (BTU)
Bob Korn Memorial Pool	Electricity (kWh)	142,796	\$20,246	487,362,748
	Fuel Oil (gallons)	19,802	\$59,241	2,653,503,230
Building Total			\$79,486	3,140,865,978

Figure 1.5 – Breakdown of Energy by Fuel and End Use

Distribution of Energy Consumed (BTU's)**Distribution of Electric Consumption**

For the most part, the pool heats this building. AkWarm© modeling limitations preclude breaking out building heat provided directly by the boiler from building heat provided by the pool, which is, of course, originally provided by the boiler.

Distribution of Fuel Oil Consumption

1.5 Benchmark Summary & Evaluation of Consumption

A benchmark measure of energy use relative to other similar-use buildings is the Energy Use Index (EUI), which takes the total annual energy used by the facility divided by the square footage area of the building, for a value expressed in terms of kBTU/SF. This number can then be compared to other buildings to see if it is average, higher or lower than similar-use buildings. Likewise, the Energy Cost Index (ECI) is the cost of all energy used by the building expressed in \$/SF of building area.

Often an average of 3 years energy consumption is used as a baseline for the benchmark analysis, but in this case there were factors which suggested that 2015 was most representative of the current building operation and would provide the most accurate analysis. These factors include:

- iii. The occupancy and operating hour of the pool peaked in 2015
- iv. Occupancy and use records are very accurate for 2015
- v. Fuel use during 2014 and 2015 is similar but 2013 is unusually high; this is believed to be indicative of a different mode of operation of the ventilation system in the building

Figures 1.6 and 1.7 show the EUI and ECI of the subject building and how it compares to other similar use buildings in the region. A complete benchmark analysis is found in Appendix B.

Figure 1.6 – EUI and ECI for the benchmark period

	EUI (kBTU/SF)	ECI (\$/SF)
Electric	62.8	\$2.61
Fuel Oil	342.2	\$7.64
Building Total	405.0	\$10.25

Comparison to similar use buildings

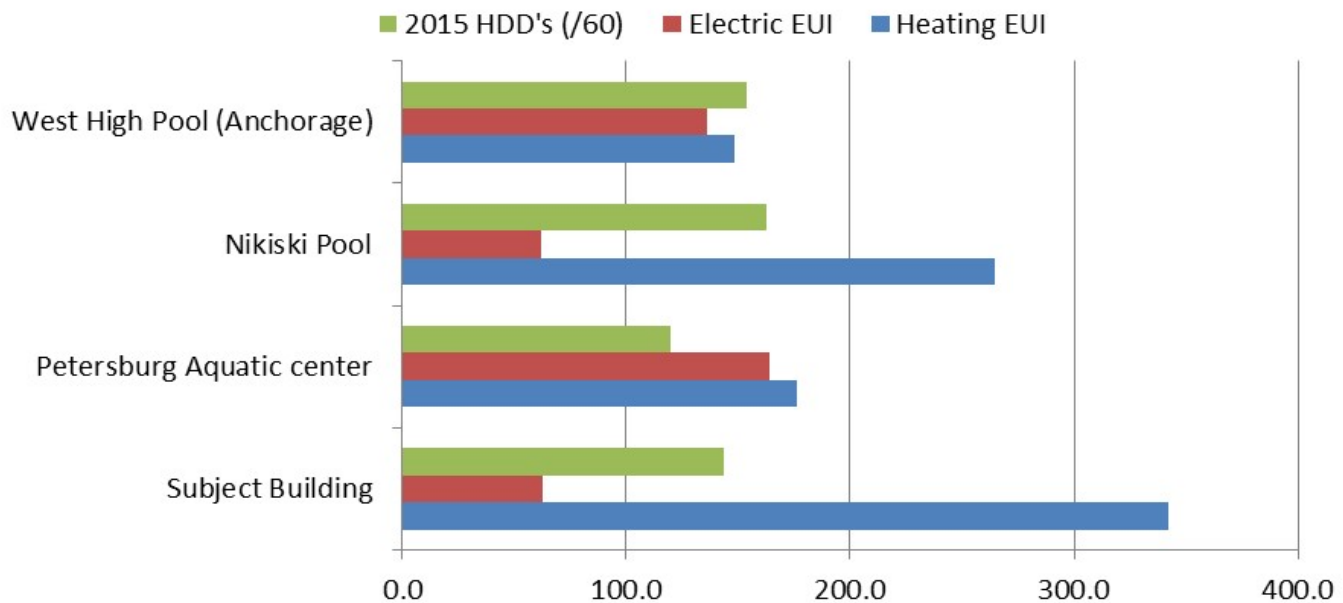
Figure 1.7 shows how the subject building compares with other buildings with pools. There are few stand-alone pools in the region, so a wider sample was obtained. The green bar represents heating degree days (HDD's) which are a measure of the severity of weather. The consumption of heating fuel should be proportionate to HDD's, which allows comparison between different climate zones such as Anchorage and Cordova.

Along with the Nikiski pool, this building's electric EUI is the lowest of all comparison buildings. The auditor performed an audit on the West High pool and observed that the light levels in that building were substantially higher than the light levels at the Cordova pool. Additionally, although the pool is of similar size, the West High Pool building is nearly three times the size (22,599 SF) of the Cordova pool and contains many more offices and plug loads than the subject building, which results in a higher EUI. The Petersburg Aquatic center is also more than twice the size (19,200 SF) of the subject building, so it is presumed it's electric consumption on a per square foot basis, is higher for the same reasons. The Nikiski pool is also housed in a very large building (35,460 SF) whose configuration is unknown so the reason for its very low electric EUI are also unknown.

The subject building's heating EUI (342.2 kBTU/SF) is nearly twice what would be expected based on the comparison buildings. This suggests that most of the savings from recommended EEM's should be from fuel oil consumption reduction, which is in line with the EEM savings results shown in Table 1.1. If all the recommended EEM's in Table 1 were implemented, the

new heating EUI would be 215 kBtu/SF, which would be below the Nikiski pool's heating EUI and slightly higher than the West High and Petersburg pools heating EUI's.

Figure 1.7 – EUI Comparison of Similar Use Buildings



1.6 Recommended Energy Efficiency Measures – EEM's

Various Energy Efficiency Measures (EEMs) have been analyzed for this building to determine if each would provide energy savings with reasonably good payback periods. EEMs can be recommended for reasons including:

- 1.) they have a reasonably good payback period
- 2.) for code or safety compliance
- 3.) end of life (EOL) equipment replacement
- 4.) strategic reasons important to the building owner/operator
- 5.) reasons pertaining to efficient building management³, facility management strategy, operations, maintenance and/or safety

Despite the fact that several lighting EEM's are not cost effective when standing alone, all of the lighting EEM's that were considered for this facility are recommended. EEM's that were considered but not recommended are detailed below. The recommended EEM's are shown in Table 1.1 below and are summarized, by type, in Figure 1.7. Section 4.3 explains each EEM in more detail and includes the auditor's notes. Maintenance savings are included with the energy savings in the summary tables and have been considered when evaluating an EEM's desirability. Appendix D includes information as to how costs were estimated.

The following lighting upgrade philosophy is recommended and is implemented through the EEM's recommended in Table 1.1: In the interest of building management efficiency, upgrade

³ See Appendix D.4.3 for additional discussion regarding Efficient Building Management

the entire facility to LED lighting. Occupancy sensors should be installed in intermittently occupied spaces including mechanical and locker rooms, the natatorium, offices, the laundry room and family bathroom.

Figure 1.7 – Summarized EEM's by Type

	Savings (including maintenance savings)	Cost	Simple Payback (yrs.)
HVAC & Pool related	\$24,412	\$280,900	11.5
Lighting	\$4,783	\$23,096	13.9
Totals	\$29,195	\$303,996	10.4

Each EEM in Table 1.1 includes estimated installation costs, estimated energy savings and a simple payback. Carbon Dioxide reduction and additional measures of financial return are provided in Table 4.1 and Section 4.3.

EEM's considered but not recommended:

Roof insulation: EEM #24 in Table 1.1 shows what additional insulation would cost and save, if the additional insulation was added during a future re-roofing project. The \$148 savings is inadequate to justify the cost.

Premium efficiency pool pump motor: A premium efficiency pool pump motor would save \$86/yr. The existing motor was replaced within the last 2 years, the savings is inadequate to justify replacement of a new pump.

Reduce DHW temperature from 138 to 115: This EEM would reduce heating costs by \$312/yr, but given the fact that the mixing valve serving the showers will have to be adjusted to increase the percentage of hot water from 77% to 93% to maintain a 107F shower temperature), the additional 132 gallons/day of hot water that would be required more than offsets the heating savings.

TABLE 1.1 RECOMMENDED EEMS

EEM No.	Category	Location	Existing Configuration	Improvement Description	Installed Cost	Annual Energy & Maint. Savings	Simple Payback	Notes
2	HVAC And DHW	Boiler room	Pumps run 24/7/365	1.) add DHW re-circulation pump timers to CP-5 & CP-7 (HWG circulation pump and DHW re-circulation pump) to reduce HWG & DHW circulation operation to only hours when pool is open.	\$1,000	\$800	1.3	Add timers to (2) circulation pumps and program to run only during occupied hours. Total installed cost estimated to be \$1,000.
3	Lighting - Power Retrofit	Lobby night light	FLUOR (4) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with LED (4) 14W Module	\$154	\$157	1.0	Remove ballast in (1) fixture, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (4) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Maintenance savings \$5/fixture
4	Lighting - Power Retrofit	Locker rooms, night lights	4 FLUOR (2) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with 4 LED (21) 14W Module	\$375	\$349	1.1	Remove ballast in (4) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (8) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Maintenance savings \$5/fixture
5	Lighting - Power Retrofit	Boiler room - turned on all day	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Replace with 3 LED 14W Module	\$83	\$47	1.8	Replace 3 (turned on every day) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr. Add (1) ceiling mounted occupancy sensor @ \$125 parts + \$45 labor.
6	Lighting - Power Retrofit	Lobby, offices, laundry	5 FLUOR (4) T12 4' F40T12 40W Standard (2) Magnetic with Manual Switching	Replace with 5 LED (4) 14W Module (2)	\$769	\$310	2.5	Remove ballast in (5) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (20) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Maintenance savings \$5/fixture
7	Lighting - Power Retrofit	Locker rooms	21 FLUOR (2) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with 21 LED (21) 14W Module	\$1,968	\$626	3.1	Remove ballast in (21) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (42) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) ceiling mounted occupancy sensors in EACH locker room @ \$125 ea parts + 1 hr labor each @ \$125/hr (requires electrician). Maintenance savings \$5/fixture. Data logging showed mens locker to be unoccupied 83% when lights were on and 62% in womens locker.

TABLE 1.1 RECOMMENDED EEMS

EEM No.	Category	Location	Existing Configuration	Improvement Description	Installed Cost	Annual Energy & Maint. Savings	Simple Payback	Notes
8	Lighting - Combined Retrofit	Natatorium	18 MH 400 Watt Magnetic with Manual Switching	Replace with 18 LED 119W Module and Remove Manual Switching and Add new Occupancy Sensor	\$13,560	\$2,535	5.3	Replace (18) 400w MH fixtures with 119w LED's with integral dimming occupancy sensors @ \$450 ea parts + 2 hrs labor ea @ \$110/hr + \$1500 lift rental. Maintenance savings \$10/fixture.
9	Lighting - Power Retrofit	Offices, laundry & family bathroom	5 FLUOR (4) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with 5 LED (4) 14W Module	\$837	\$245	3.4	Remove ballast in (7) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (20) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) switch mounted occupancy sensors in family bathroom and laundry room and ceiling mounted sensors in office @ \$125 ea parts + 1 hr labor @ \$45/hr. Maintenance savings \$5/fixture
10	Lighting - Power Retrofit	Small office off lobby	FLUOR (2) CFL, A Lamp 20W with Manual Switching	Replace with LED (2) 10W Module	\$14	\$4	3.5	Replace (2) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost. Add fixture mounted occupancy sensor @ \$125 parts + 1 hr labor @ \$45.
11	Lighting - Power Retrofit	AHU Fan & EF Fan rooms - Incand	3 INCAN A Lamp, Std 60W with Manual Switching	Replace with 3 LED 10W Module	\$21	\$3	7.0	Replace (3) 60w incandescent bulbs with 9.5w LED's @ \$7ea and no labor cost.
12	Lighting - Power Retrofit	Exterior	4 MH 175 Watt Magnetic with Manual Switching	Replace with 4 LED 56W Module	\$1,780	\$307	5.8	Replace (4) 175w MH fixtures with 56w LED fixtures @ \$400 ea + 1 hr labor each @ \$45/hr. \$5/fixture maintenance savings.
13	Lighting - Power Retrofit	Storage rooms	3 INCAN A Lamp, Std 60W with Manual Switching	Replace with 3 LED 10W Module	\$21	\$3	7.0	Replace (3) 60w incandescent bulbs with 9.5w LED's @ \$7ea and no labor cost.
1	Ventilation	Building-wide	Both AHU's & EF's run 24/7/365; no heat recovery	1.) Add schedule controls to AHU-2 reduce operating hours to when building is occupied. Estimated cost \$4,000 2.) replace EF's in locker rooms with humidity sensing models, reduce operation by 65%. Estimated cost \$600. 3.) De-commission and replace AHU-1, EF-1 & EF-2 with DesertAire system used to de-humidify, then heat the space, OSA and pool water with recovered	\$279,600	\$23,587	11.9	The costs and savings of these EEM's are combined since both result from an HVAC upgrade.
15	Natatorium de-humidification and pool heat	Natatorium, Pool	Swimming Pool Load					

TABLE 1.1 RECOMMENDED EEMS

EEM No.	Category	Location	Existing Configuration	Improvement Description	Installed Cost	Annual Energy & Maint. Savings	Simple Payback	Notes
				heat. Add deck level chloramine extraction system with heat recovery. Estimated costs are \$150,000 for parts, \$100,000 for mechanical, electrical & general contracting, \$25,000 for engineering.				
16	Setback Thermostat	Locker rooms	Existing Unoccupied Heating Setpoint: 70.0 deg F	Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Locker rooms space.	\$300	\$25	12.0	Replace (2) existing manual thermostats with programmable setback models @ \$150 ea including labor
A1	Water Savings	Locker room shower heads	4.0 gpm heads	Replace with 1.5 gpm heads	\$1,800	\$1,135	1.6	Men's locker has (2) 1.5 gpm heads and (4) 4.0 gpm heads. It is assumed same configuration in women's locker room. Replace all (12) shower heads (including the 1.5 gpm heads, for ease of maintenance) with 1.5 gpm heads @ total cost of \$1,800.
TOTAL OF ALL COST EFFECTIVE EEM'S					\$302,282	\$30,133	10.3	
The following EEM's were not found to be cost effective from a financial perspective but are still recommended								
17	Lighting - Combined Retrofit	Storage area off lobby	FLUOR (2) T8 4' F32T8 32W Standard Instant with Manual Switching	Replace with LED (2) 14W Module and Remove Manual Switching and Add new Occupancy Sensor	\$264	\$26	10.2	Remove ballast in (1) fixture, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (2) 32w T8 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add fixture mounted occupancy sensor @ \$125 parts + 1 hr labor @ \$45. Maintenance savings \$5/fixture
18	Lighting - Controls Retrofit	Boiler room - turned on all day	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Improve Manual Switching	\$165	\$11	15.0	Replace 3 (turned on every day) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr. Add (1) ceiling mounted occupancy sensor @ \$125 parts + \$45 labor.
19	Lighting - Controls Retrofit	Offices, laundry & family bathroom	5 FLUOR (4) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Remove Manual Switching and Add new Occupancy Sensor	\$680	\$45	15.1	Remove ballast in (7) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (20) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) switch mounted occupancy sensors in family bathroom and laundry room and ceiling mounted sensors in office @ \$125 ea parts + 1 hr labor @ \$45/hr. Maintenance savings \$5/fixture

TABLE 1.1 RECOMMENDED EEMS

EEM No.	Category	Location	Existing Configuration	Improvement Description	Installed Cost	Annual Energy & Maint. Savings	Simple Payback	Notes
20	Lighting - Controls Retrofit	Locker rooms	21 FLUOR (2) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Remove Manual Switching and Add new Occupancy Sensor	\$2,000	\$111	18.0	Remove ballast in (21) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (42) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) ceiling mounted occupancy sensors in EACH locker room @ \$125 ea parts + 1 hr labor each @ \$125/hr (requires electrician). Maintenance savings \$5/fixture. Data logging showed men's locker to be unoccupied 83% when lights were on and 62% in women's locker.
21	Lighting - Power Retrofit	Chemical room	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Replace with 3 LED 14W Module	\$103	\$3	34.3	Replace 4 (only 3 working during survey) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr.
22	Lighting - Power Retrofit	Boiler room - other	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Replace with 3 LED 4W Module	\$83	\$3	27.7	Replace 3 (only 2 working during survey) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr.
23	Lighting - Power Retrofit	AHU Fan & EF Fan rooms - CFL	6 FLUOR CFL, A Lamp 20W with Manual Switching	Replace with 6 LED 10W Module	\$42	\$1	42.0	Replace (6) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost.
23	Lighting - Controls Retrofit	Small office off lobby	FLUOR (2) CFL, A Lamp 20W with Manual Switching	Remove Manual Switching and Add new Occupancy Sensor	\$170	\$4	42.5	Replace (2) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost. Add fixture mounted occupancy sensor @ \$125 parts + 1 hr labor @ \$45.
25	Lighting - Combined Retrofit	Vestibule	FLUOR CFL, A Lamp 20W with Manual Switching	Replace with LED 10W Module and Improve Manual Switching	\$7	(\$6)	-1.2	Replace (1) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost. This lamp was burned out, so there will be negative savings from this EEM.
TOTAL OF ALL RECOMMENDED EEM'S					\$305,795	\$30,331	10.1	
The following EEM's were considered but are not recommended								
24	Building Shell Ceiling Cathedral	Roof/Ceiling	Framing Type/spacing: Standard/24"; Insulated Sheathing: None; Bottom Insulation Layer: XPS (Blue/Pink Foam), 3 inches; Modeled R-Value: 17.8	Add R-19 to existing insulation.	\$39,723	\$148	268.4	This EEM adds 4" (approx. R-20) additional rigid foam during roof replacement - cost of roof replacement is not included here. Eagle Contracting (roof vendor quoted the project in 2015) estimated \$7.50/SF for additional 4" of rigid foam during replacement; structural engineering may be required for fastening system specification.

Figure 1.8 summarizes the energy consumption and costs for the existing building and for the proposed building after the recommended EEM's are implemented.

Figure 1.8 – Summary with all EEM's incorporated
(Electric and Fuel oil only, does not included water/sewer costs)

	Existing conditions		Proposed Conditions		Effective reduction in building energy consumption and costs
		kBTU of consumption		kBTU of consumption	
kWh Electric	142,796	487,363	101,216	345,450	29.12%
Gallons Oil	19,802	2,653,503	12,449	1,668,166	37.13%
Building Energy Cost	\$79,486		\$51,771		34.87%

1.7 Recommended Energy Conservation Measures – ECM's

No and low-cost EEM's are called ECM's and are usually implemented by the existing operations and maintenance staff (they are also called O & M recommendations). ECM's can result in cost and consumption savings, but they also prevent consumption and cost increases, which are more accurately called "avoided costs" rather than cost savings. The following ECM's are recommended for this facility. Additional detail and explanation for each ECM is provided in Appendix D. The avoided annual energy cost calculations below are based on the proposed building with all recommended EEM's in Table 1.1 implemented.

- a) Implement Building Monitoring and install cumulative fuel oil flow meter (See Appendix H). Create an Energy Champion and perform monthly walk through using an Energy Checklist.

Estimated cost for flow meter:	\$1,500
Estimated cost for Energy Champion Training	\$2,000

The avoided costs range from 5% to 15% of the overall building energy cost, 10% is used here:

Avoided cost:	\$5,177
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- b) Maintain HVAC systems.

Estimated cost	\$ 500
Avoided cost if 3% efficiency reduction is prevented:	\$ 212

- c) Boiler temperature reset – based on outdoor temperature, the boiler water temperature should be reset from 180F to 155F during the summer months

2. AUDIT AND ANALYSIS BACKGROUND

2.1 Program Description

This audit included the identification, development, and evaluation of EEM's for the Cordova City Pool. The scope of this project included evaluating building shell, lighting and other electrical systems and equipment, HVAC equipment, hot water heating equipment, shower heads and motors and pumps. Measures were analyzed based on life-cycle-cost techniques (using SIR), which include the initial cost (also called "first cost") of the equipment, life of the equipment, annual energy cost, annual maintenance cost, and a discount rate of 3.0% per year in excess of general inflation.

2.2 Audit Description

Preliminary audit information including building plans and utility consumption data (if available) was gathered in preparation for the site survey. An interview was conducted with the building owner or manager to understand their objectives, ownership strategy and other information the auditor could use to make the audit most useful to the client. The site survey provides critical information in deciphering where energy is used and what savings opportunities exist within a building. The entire site was surveyed, including every accessible room, and the areas listed below were evaluated to gain an understanding of how the building operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Building-specific equipment (process equipment)
- Plug loads
- Water consumption by shower heads

The building site visit was performed to survey all major building components, systems and equipment and included detailed inspection of all energy consuming components. Summaries of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager/owner were collected along with as much system and component nameplate information as was available.

2.3 Method of Analysis

The details collected by the auditor enabled a simulation model of the building's overall energy usage to be developed – this is referred to as "existing conditions" or the "existing building". The analysis involves distinguishing the different fuels used on site, and analyzing their consumption in different activity areas of the existing building.

Building Simulation Model

An accurate model of the building performance can be created by simulating the thermal performance of the walls, roof, windows and floors of the building, adding any HVAC systems, ventilation and heat recovery, adding major equipment, plug loads, any heating or cooling process loads, the number of occupants (each human body generates approximately 450 BTU/hr. of heat) and the hours of operation of the building.

For the purposes of the model, the City of Cordova Pool was broken down into the following activity areas:

- 1) Natatorium: 5,300 square feet
- 2) Locker rooms: 1,050 square feet
- 3) Office: 400 square feet
- 4) Mechanical rooms: 605 square feet
- 5) Lobby: 400 square feet

The methodology took a range of building-specific factors into account, including::

- Occupancy hours
- Local climate conditions
- Prices paid for energy

For the purposes of this study, the thermal simulation model was created using a modeling tool called AkWarm© Energy Use Software. The building characteristics and local climate data were used to establish a baseline space heating and cooling energy usage. The model was calibrated and was then capable of predicting the impact of theoretical EEM's. The calibrated model is considered to represent "existing conditions" or the "existing building".

Limitations of AkWarm© Models

The model is based on local, typical weather data for Cordova. This data represents the average ambient weather profile as observed over approximately 30 years. As such, the monthly fuel use bar charts in Section 3.2 will not likely compare perfectly, on a monthly basis with actual energy billing information from any single year. This is especially true for years with extreme warm or cold periods, or even years with unexpectedly moderate weather. For this reason the model is calibrated to the building's annual consumption of each fuel.

The heating and cooling load model is a simple two-zone model consisting of the building's core interior spaces and the building's perimeter spaces. This simplified approach loses accuracy for buildings that have large variations in cooling/heating loads across different parts of the building.

AkWarm© does not have the capability to model HVAC systems that simultaneously provide both heating and cooling to the same building space. As an example, large footprint office buildings with expanses of glass walls typically have to provide cooling to southern exposed offices and heating to interior spaces at the same time, so the HVAC system delivers cool 55 degree air to all spaces and re-heats it (called a VAV system with terminal re-heat) in the spaces where heat is required.

Financial Analysis

AkWarm© provides a number of tools for assessing the cost effectiveness of various EEM's. These tools utilize **Life-Cycle Costing**, which is defined in this context as a method of cost analysis that estimates the total cost of a project over its life. The total cost includes both the construction cost (also called "first cost") plus ongoing maintenance and operating costs.

Savings to Investment Ratio (SIR) = Savings divided by Investment

Savings includes the total discounted dollar savings considered over the life of the EEM, including annual maintenance savings. AkWarm© calculates projected energy savings based on occupancy schedules, utility rates, building construction type, building function, existing conditions, and climatic data uploaded to the program based on the zip code of the building. Changes in future fuel prices, as projected by the Department of Energy, are included over the life of the improvement. Future savings are discounted to their present value to account for the time-value of money (i.e. money's ability to earn interest over time). The **Investment** in the SIR

calculation is the first cost of the EEM. An SIR value of at least 1.0 indicates that the project is cost-effective, i.e. total savings exceed the investment costs.

Simple payback is a cost analysis method whereby the investment cost of a project is divided by the first year's energy and maintenance savings to give the number of years required to recover the cost of the investment. This may be compared to the expected time before replacement of the system or component will be required. For example, if a boiler costs \$12,000 and results in a savings of \$1,000 in the first year, the payback time is 12 years. If the boiler has an expected life until replacement of 10 years, it would not be financially viable to make the investment since the payback period of 12 years is greater than the project life.

The Simple Payback calculation does not consider likely increases in future annual savings due to energy price increases, nor does it consider the need to earn interest on the investment (i.e. the time-value of money). Because of these simplifications, the SIR figure is considered to be a better financial investment indicator than the Simple Payback measure.

Measures are ranked by AkWarm© in order of decreasing SIR. The program first calculates individual SIR's and ranks them from highest to lowest. The software then implements the first EEM, re-calculates each subsequent measure and again re-ranks the remaining measures in order of their SIR. An individual measure must have an individual $SIR \geq 1$ to be considered financially viable on a stand-alone basis. AkWarm© goes through this iterative process until all appropriate measures have been evaluated and implemented in the proposed building model.

SIR and simple paybacks are calculated based on estimated first costs for each measure. First costs include estimates of the labor and equipment required to implement a change. Costs are considered to be accurate within +/-30% in this level of audit; they are derived from Means Cost Data, industry publications, the auditors experience and/or local contractors and equipment suppliers.

Interactive effects of EEM's:

It is important to note that the savings for each recommendation is calculated based on implementing the most cost effective measure first (highest SIR), then the EEM with the second highest SIR, then the third, etc. Implementation of an EEM out of the order will affect the savings of the other EEM's. The savings may in some cases be higher and in other cases, lower. For example implementing a reduced operating schedule for inefficient lighting will result in relatively high savings. Implementing a reduced operating schedule for newly installed efficient lighting will result in lower relative savings, because the efficient lighting system uses less energy during each hour of operation. If some of the recommended EEMs are not implemented, savings for the remaining EEMs will be affected, in some cases positively, and in others, negatively. If all EEM's are implemented, their order of implementation is irrelevant, because the total savings after full implementation will be unchanged. If an EEM is calculated outside of the AkWarm© model, the interactive effects of that EEM are not reflected in the savings figures of any other EEM.

Assumptions and conversion factors used in calculations:

The underlying assumptions used in the calculations made in this audit follow:

- 3413 BTU/kWh
- 60% load factor for all motors unless otherwise stated
- 134,000 BTU/gallon of #1 fuel oil

2.4 *Limitations of Study*

All results are dependent on the quality of input data provided, and can only act as an approximation. In some instances, several methods may achieve the identified savings. This report is not a design document and the auditor is not proposing designs, or performing design engineering. A design professional who is following the EEM recommendations and who is licensed to practice in Alaska in the appropriate discipline, shall accept full responsibility and liability for the design, engineering and final results.

Budgetary estimates for engineering and design of these projects is not included in the cost estimate for each EEM recommendation; these costs can be approximated at 15% of the materials and installation costs.

3. BOB KORN MEMORIAL POOL

3.1 *Building Description*

This building was constructed in or around 1973 and an HVAC renovation occurred in 1983. According to plans, the boiler was replaced in 1987, and it appears the boiler was replaced again in 2007. Original 1973 building plans and the 1983 renovation plans were available. These plans and the auditor's measurements and observations were used as the basis for this audit.

See Appendix A for a schedule of mechanical components, large motors, plumbing fixtures, appliances and plug loads.

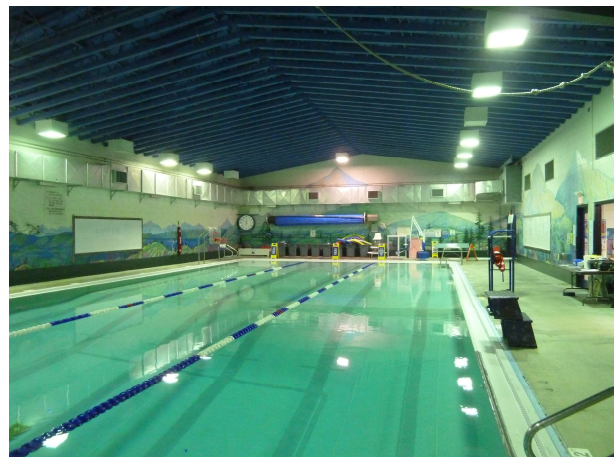
Description of Building Shell & Pool

This building is constructed on a 4" concrete slab surrounding the pool. The walls are 8" CMU's with 1-1/2" of rigid foam applied to their exterior, covered with horizontal vinyl siding. The interior CMU walls are painted. The walls of the west wing (containing locker rooms, lobby and offices) are constructed using 2" x 6" wood studs 16" oc, whose cavities are filled with R-19 fiberglass batt. The exterior of these walls is also finished with horizontal vinyl siding, the interior with painted gypsum.

The painted metal, pitched roof covers 3" of rigid foam insulation which is supported by plywood sheathing supported by wood and metal scissors trusses in the low section of the natatorium and 12" x 48" glue laminated beams in the clearstory section of the natatorium. The same roof surface over the west wing is supported by 2" x 10" joists. The interior ceilings in the natatorium are exposed sheathing or tongue and groove car decking, the ceilings in the lobby/office area and locker rooms are tongue and groove wood (presumed to be cedar).

Entry doors are store front with double pane glass in metal frames. Emergency exit doors are solid surface metal, presumed to have a honeycomb core. There is only one window in the building, it is adjacent to the main entry door and utilizes double pane glass in a metal frame.

Overall, the building shell appears to be in average condition considering its age.



Pool

The 134,000 gallon, 36' x 75' pool varies in depth from 3' to 12'. It has an aluminum shell with a plastic liner and uses a salt system with an auxiliary UV system for sanitation. The pool water temperature setpoint is 80F, it measured 80.7F during the survey and read 79F on the pool water controller digital readout. The natatorium RH measured 64%, the dew point measured 67.9F and the dry bulb temperature measured 82F (thermostat read 83F).

Heating, Cooling, Ventilation and Controls

The Heating Plants used in the building are:

B-1

Nameplate Information:	Viessman VD2-700
Fuel Type:	#1 Oil
Input Rating:	3,059,000 BTU/hr
Steady State Efficiency:	88 %
Idle Loss:	1 %
Heat Distribution Type:	Glycol
Boiler Operation:	All Year
Notes:	Oil fired Vitorond 200, 3,059 MBH input, 2,693 MBH output, max. 35% turndown, 180F setpoint, SN 7134287500010103, mfg 2005; Riello RL/2 burner, 1.5 HP motor, SN 06D 951430000001

Distribution: Heat is distributed in this building by (5) Grundfos constant speed circulation pumps. They appear to serve the following areas, and all pumps are presumed to run continually:

- Pre-heat coil in AHU-1
- Main heating coil in AHU-1
- Heating coil in AHU-2
- DHW generators
- Hydronic baseboard and unit heaters

Controls: The boiler has internal, proprietary controls, presumed to have an outside air temperature reset, but it is not known if this feature is in use. The boiler controls also manage the DHW temperature, as the hot water generators are integral to the Viessman system.

Each perimeter fintube baseboard heater is controlled by a thermostatic control valve; the vestibule valve is non-functional, as it is missing parts (image at right). The locker room unit heaters are controlled by manual thermostats but both units were turned off during the site survey, due to the fact that they are noisy and blow air directly on wet bathers.

AHU's: The 1983 sequence of operations does not indicate when or for how long AHU-1 or AHU-2 operate. They were data logged (see Appendix G) and both were



found to run continually during the logging period so their fan motors are are uncontrolled. Their heating coil valves are controlled by the programmable thermostat in the office (AHU-2) and the manual thermostat in the natatorium (AHU-1)

Natatorium: The sequence of operations specifies that one of the clearstory exhaust fans is to run any time AHU-1 is operating. 60F is to be maintained in the AHU-1 pre-heat chamber (this has been adjusted down to 50F) with the OSA dampers open to 50% and by modulating the pre-heat coil control valve. Mixed air temperature is to be maintained at 60F by modulating the main heating coil and the RA and OSA dampers. A humidistat controls the second and third clearstory exhaust fans (EF-3 was found to be manually turned off) and over-rides the mixed air control to open the OSA dampers and allow more OSA if the humidity is higher than the set point, which is specified as 70% in the sequence of operations. The actual RH was found to vary from 35% to 70%. (A typical RH set point should be 55%.)

Office & Lobby area: There was no available sequence of operations for AHU-2 which, as previously mentioned, runs continually. There are occupant complaints of little or no heat from the air diffusers in these areas. A sampling of air flows found them to be within 10% of what is specified on building plans, but the SA temperature is 20F below what should be supplied which could indicate a problem either with the heating coil, thermostat or hydronic control valve. Upon visual inspection, the heating coil in AHU-2 appears to be significantly clogged with dirt which will cause a high static pressure (and higher motor load), and given the condition of the outside of the coil, it is most likely that the inside fluid channels are also clogged, which would reduce the temperature of SA.

There is no cooling in the building.

Domestic Hot Water System

DWH is produced by two hot water generators located in the boiler room. Gauges indicated 136F and 141F water temperatures at the time of the survey. Pre-mixed hot water temperature at the shower heads was measured at 107F. There is a re-circulation pump located in the boiler room which appears to run continually.

Appliances

An under-counter refrigerator is located in the laundry room along with a clothes washer and electric clothes dryer.

Plumbing

There are (4) flushometer type, WC's (toilets) in this facility, all with manual valves. They appear to use more than 3 gpf. There are (3) lavatory sinks which appear to use 1.5 to 2.0 gpm. All lavatory faucets have manual valves. There are 6 each shower heads in the men's and women's locker rooms, 4 of which (in the men's locker) have 4 gpm heads and 2 of which have 1.5 gpm heads. There is a single urinal in the facility; it appears to use 1 gpf.

Interior Lighting

The interior lighting in this building is a mixture of T12 florescent lamps with magnetic ballasts, Metal Halide high bay lighting in the natatorium, CFL and incandescent A-type screw-in bulbs and BR30 incandescent reflector bulbs. There is a single fixture using T8 lamps with an electronic ballast in the storage area off of the lobby. There are no interior lighting controls in use.

Exterior Lighting

There are (4) HPS entry soffit fixtures, which are presumed to use 175w lamps; they are reported to be controlled by a photocell sensor.

Motors

The large motors in this facility include the 5 HP pool water circulation pump and the 10 HP supply fan motor in AHU-1. The pool circulation pump has a nominal efficiency of 87.5% and has just been replaced, so is not a candidate for a premium efficiency replacement. The nameplate on the 10 HP fan motor was not accessible, so its efficiency rating is unknown.

Major Equipment and Plug Loads

The equipment schedule and a partial listing of plug loads is found in Appendix A.

3.2 Predicted Energy Use

3.2.1 Energy Usage / Tariffs

The AkWarm© model was calibrated on an annual basis, to match the actual electric and fuel oil baseline consumption data. After calibration, the AkWarm© model predicts the annual usage of each fuel as shown in the fuel use bar charts below. The raw utility source data, in addition to being used for AkWarm© calibration, is evaluated and benchmark analysis is performed in Appendix B.

The utility company's providing energy to the building, and the class of service provided by each, are listed below:

Electricity: Cordova Electric Cooperative - Commercial – Sm

Fuel Oil data was provided by the City of Cordova, through accounting ledgers.

The average cost for each type of fuel used in this building is shown below in Table 3.1. These Energy costs include all surcharges, subsidies, demand charges, taxes and utility customer charges and are based on the cost data provided by the electric utility and the City of Cordova.

Table 3.1 Average Energy Cost	
Description	Average Energy Cost
Electricity	\$ 0.1435/kWh
#1 Oil	\$ 2.99/gallons

Electric utility providers measure consumption in kilowatt-hours (kWh) and maximum demand in kilowatts (kW). One kWh usage is equivalent to 1,000 watts running for one hour. One kW of electric demand is equivalent to 1,000 watts running at a particular moment.

Fuel oil consumption is measured in gallons, but unless there is a cumulative meter on the day tank, data provided for analysis is typically gallons delivered, not gallons consumed. It is assumed that all of the oil delivered during the benchmark period was consumed during the benchmark period. One gallon of #1 fuel oil provides approximately 134,000 BTU's of energy. #1 fuel oil is typically more expensive than #2 oil, but has a lower gel point, so can be used in colder climates.

3.2.1.1 Total Energy Use and Cost Breakdown

At then-current rates, the City of Cordova has spent an average of \$76,498 annually over the last 3 years for electricity and other fuel costs for this building.

	Elec. Consumption (kWh)	Cost	Elec. Demand (kW)	Cost	Total Electric Cost	Fuel Oil consumption (gal)	Cost	Total Cost	Total kBTU's
2013	145,521	\$17,313	327.8	\$2,809	\$20,842	23,904	\$97,219	\$118,061	3,651,954
2014	136,796	\$16,991	326.4	\$2,797	\$19,875	19,212	\$73,034	\$92,909	3,002,921
2015	142,796	\$16,754	320.9	\$2,772	\$20,485	19,802	\$59,241	\$79,725	3,101,261
3-year average	141,704	\$17,019	325	\$2,793	\$20,401	20,973	\$76,498	\$96,898	3,252,045

Figure 3.1 below reflects the estimated distribution of costs across the primary end uses of energy based on the AkWarm© computer simulation. Comparing the “Retrofit” bar in the figure to the “Existing” bar shows the potential savings from implementing all of the energy efficiency measures recommended in this report.

Figure 3.1

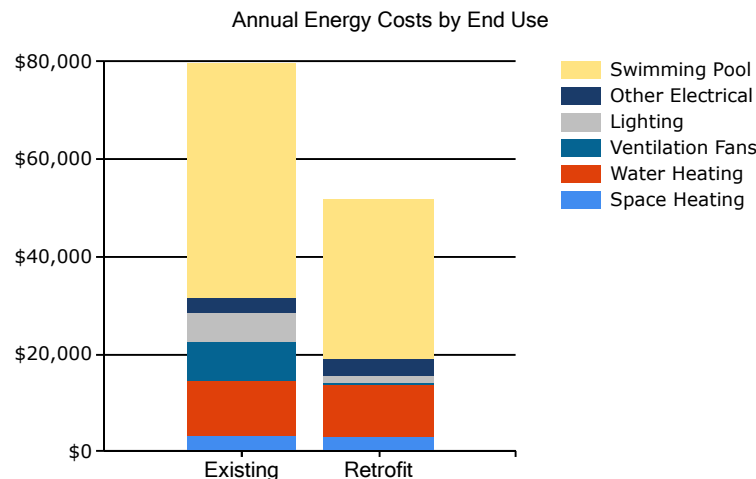


Figure 3.2 below shows how the annual energy cost of the building is distributed between the different fuels used by the building. The “Existing” bar shows the breakdown for the building as it is now; the “Retrofit” bar shows the predicted costs if all of the energy efficiency measures in this report are implemented.

Figure 3.2

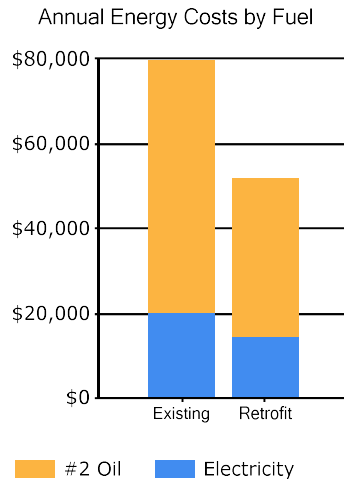
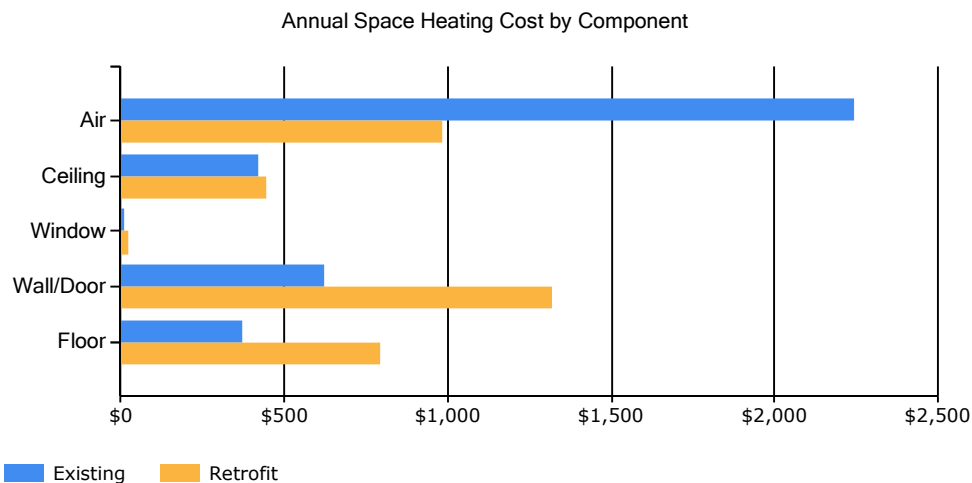


Figure 3.3 below addresses only Space Heating costs. The figure shows how each heat loss component contributes to those costs; for example, the figure shows how much annual space heating cost is caused by the heat loss through the Walls/Doors. For each component, the space heating cost for the Existing building is shown (blue bar) and the space heating cost assuming all retrofits are implemented (yellow bar) are shown. “Air” is ventilation introduced into the building plus infiltration and/or exfiltration, i.e. air leakage into or out of the building. Infiltration is typically through open doors and windows, un-caulked or loose fitting windows and joints, damaged door weather stripping and/or unsealed wall, ceiling or floor penetrations. Exfiltration can result from over-pressurizing a building which forces heated (or cooled) air out through these same gaps. “Air” is typically a significant source of heat or cooling loss in almost all buildings.

Figure 3.3

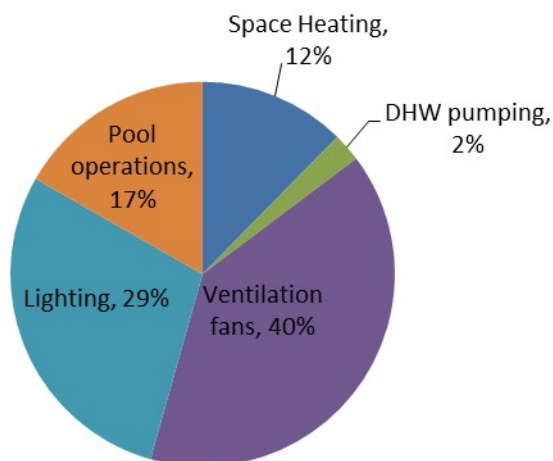


The tables below show the AkWarm© estimate of the monthly fuel use for each of the fuels used in the existing building. For each fuel, the fuel use is broken down across the energy end uses. Note that DHW refers to domestic hot water.

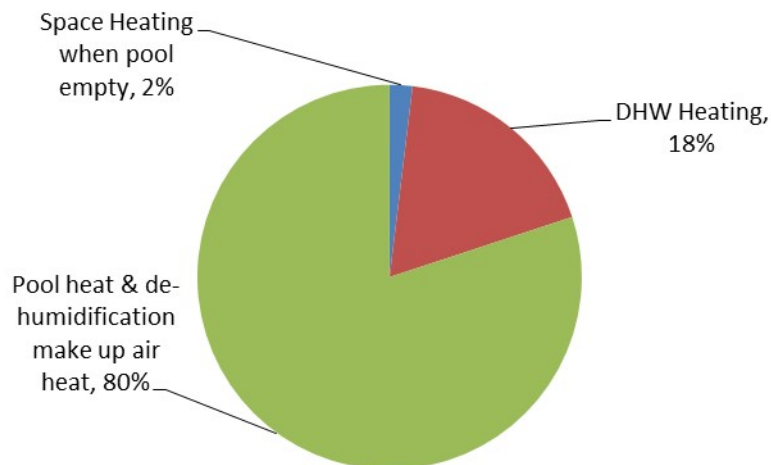
Electrical Consumption (kWh)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Space_Heating	1498	1365	1498	1450	1500	1450	1498	1498	1450	1498	1450	1498
Space_Cooling	0	0	0	0	0	0	0	0	0	0	0	0
DHW	288	262	288	279	288	279	288	288	279	288	279	288
Ventilation_Fans	4832	4403	4832	4676	4498	4676	4832	4832	4676	4832	4676	4832
Lighting	3503	3192	3503	3390	3503	3390	3503	3503	3390	3503	3390	3475
Other_Electrical	2217	2020	2217	2146	0	2146	2217	2217	2146	2217	2146	2217
Swimming_Pool	0	0	0	0	0	0	0	0	0	0	0	0

Fuel Oil #2 Consumption (Gallons)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Space_Heating	0	0	0	0	379	0	0	0	0	0	0	0
DHW	312	285	312	302	205	302	312	312	302	312	302	312
Swimming_Pool	1470	1340	1470	1423	0	1423	1470	1470	1423	1470	1423	1470

Distribution of Electric Consumption



Distribution of Fuel Oil Consumption



3.2.2 Energy Use Index (EUI)

EUI's are calculated by converting all the energy consumed by a building in one year to BTU's and multiplying by 1000 to obtain kBTU. This figure is then divided by the building square footage.

"Source energy" differs from "site energy". Site energy is the energy consumed by the building at the building site only. Source energy includes the site energy as well as all of the losses incurred during the creation and distribution of 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, and allows for a more complete assessment of energy efficiency in a building. The type of energy or fuel purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the best measure to use for evaluation purposes and to identify the overall global impact of energy use. Both the site and source EUI ratings for the building are provided below. Site and source EUI's are calculated as follows:

$$\text{Building Site EUI} = \frac{(\text{Electric Usage in kBtu} + \text{Gas Usage in kBtu} + \text{same for other fuels})}{\text{Building Square Footage}}$$

$$\text{Building Source EUI} = \frac{(\text{Electric Usage in kBtu} \times \text{SS Ratio} + \text{Gas Usage in kBtu} \times \text{SS Ratio} + \text{same for other fuels})}{\text{Building Square Footage}}$$

Where "SS Ratio" is the Source Energy to Site Energy ratio for the particular fuel.

Table 3.2 - Bob Korn Memorial Pool EUI Calculation⁴

Energy Type	Building Fuel Use per Year	Site Energy Use per Year, kBTU	Source/Site Ratio	Source Energy Use per Year, kBTU
Electricity	142,789 kWh	487,339	3.340	1,627,713
#2 Oil	19,804 gallons	2,732,896	1.010	2,760,225
Total		3,220,235		4,387,938
BUILDING AREA		7,755	Square Feet	
BUILDING SITE EUI		415	kBTU/Ft ² /Yr	
BUILDING SOURCE EUI		566	kBTU/Ft²/Yr	
* Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued March 2011.				

Building Benchmarks			
Description	EUI (kBtu/Sq.Ft.)	EUI/HDD (Btu/Sq.Ft./HDD)	ECI (\$/Sq.Ft.)
Existing Building	415.2	46.12	\$10.28
With Proposed Retrofits	266.1	29.55	\$6.68
EUI: Energy Use Intensity - The annual site energy consumption divided by the structure's conditioned area.			
EUI/HDD: Energy Use Intensity per Heating Degree Day.			
ECI: Energy Cost Index - The total annual cost of energy divided by the square footage of the conditioned space in the building.			

⁴ These electric, oil and EUI figures are based on the calibrated Ak-Warm-C model, not actual energy consumption, so there is slight differences between these figures and actual figures since it is not possible to calibrate a model to 100% of actual.

4. ENERGY EFFICIENCY MEASURES – EEM'S

4.1 Summary of Results

All of the EEM's considered for this building are summarized in Table 1.1 above. Please refer to the individual measure descriptions in Section 4.3 for more detail. Any additional detail regarding calculations and cost estimates for analyzed measures is provided in Appendix D.

Table 4.1 Bob Korn Memorial Pool, Cordova, Alaska ENERGY EFFICIENCY MEASURES							
Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR	Simple Payback (Years)	CO ₂ Savings
1	Ventilation (This EEM is combined with EEM #15 since included in the proposed HVAC upgrade)	1.) Add schedule controls to AHU-2 reduce operating hours to when building is occupied. Estimated cost \$4,000 2.) replace EF's in locker rooms with humidity sensing models, reduce operation by 65%. Estimated cost \$600. 3.) replace AHU-1, EF-1 & EF-2 with Desertair system used to de-humidify, then heat the space, OSA and pool water with recovered heat. Cost is included in EEM#XXX. Pool water heat savings is identified under EEM #X.	\$7,670	\$4,600	19.68	0.6	79,460.4
2	HVAC And DHW	1.) add DHW re-circulation pump timers to CP-5 & CP-7 (HWG circulation pump and DHW re-circulation pump) to reduce HWG & DHW circulation to the only when pool is open.	\$800	\$1,000	13.06	1.3	6,848.5
3	Lighting - Power Retrofit: Lobby night light	Replace with LED (4) 14W Module	\$152 + \$5 Maint. Savings	\$154	5.50	1.0	1,616.1
4	Lighting - Power Retrofit: Locker rooms, night lights	Replace with 4 LED (21) 14W Module	\$333 + \$16 Maint. Savings	\$375	5.02	1.1	3,539.8
5	Lighting - Power Retrofit: Boiler room - turned on all day	Replace with 3 LED 14W Module	\$47	\$83	4.73	1.8	496.6

Table 4.1
Bob Korn Memorial Pool, Cordova, Alaska
ENERGY EFFICIENCY MEASURES

Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR	Simple Payback (Years)	CO ₂ Savings
6	Lighting - Power Retrofit: Lobby, offices, laundry	Replace with 5 LED (4) 14W Module (2)	\$290 + \$20 Maint. Savings	\$769	3.93	2.5	3,073.4
7	Lighting - Power Retrofit: Locker rooms	Replace with 21 LED (21) 14W Module	\$521 + \$105 Maint. Savings	\$1,968	3.11	3.1	5,529.9
8	Lighting - Combined Retrofit: Natatorium	Replace with 18 LED 119W Module and Remove Manual Switching and Add new Occupancy Sensor	\$2,355 + \$180 Maint. Savings	\$13,560	2.89	5.3	25,034.3
9	Lighting - Power Retrofit: Offices, laundry & family bathroom	Replace with 5 LED (4) 14W Module	\$225 + \$20 Maint. Savings	\$837	2.46	3.4	2,396.8
10	Lighting - Power Retrofit: Small office off lobby	Replace with LED (2) 10W Module	\$4	\$14	2.22	3.8	39.5
11	Lighting - Power Retrofit: AHU Fan & EF Fan rooms - Incand	Replace with 3 LED 10W Module	\$3	\$21	2.10	7.0	31.4
12	Lighting - Power Retrofit: Exterior	Replace with 4 LED 56W Module	\$287 + \$20 Maint. Savings	\$1,780	1.57	5.8	2,996.9
13	Lighting - Power Retrofit: Storage rooms	Replace with 3 LED 10W Module	\$3	\$21	1.13	7.4	30.2
14	Setback Thermostat: Locker rooms	Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Locker rooms space.	\$25	\$300	1.13	12.0	184.5
15	Natatorium de-humidificaiton (Combined with EEM #1 since included in the proposed HVAC upgrade)	De-Commission AHU-1, EF-1,2 & 3 and Install Desertair system to ventilate and de-humidify natatorium and for chloramine extraction, use recovered heat to heat space and pool water. Estimated costs are \$150,000 for parts, \$100,000 for mechanical, electrical & general contracting, \$25,000 for engineering.	\$14,917 + \$1,000 Maint. Savings	\$275,000	1.06	17.3	90,343.8

Table 4.1
Bob Korn Memorial Pool, Cordova, Alaska
ENERGY EFFICIENCY MEASURES

Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR	Simple Payback (Years)	CO ₂ Savings
	TOTAL, cost-effective measures		\$27,632 + \$1,366 Maint. Savings	\$300,482	1.51	10.4	221,622.0
The following measures were <i>not</i> found to be cost-effective:							
16	Lighting - Combined Retrofit: Storage area off lobby	Replace with LED (2) 14W Module and Remove Manual Switching and Add new Occupancy Sensor	\$21 + \$5 Maint. Savings	\$264	0.83	10.2	222.8
17	Lighting - Controls Retrofit: Boiler room - turned on all day	Improve Manual Switching	\$11	\$165	0.58	14.4	121.8
18	Lighting - Controls Retrofit: Offices, laundry & family bathroom	Remove Manual Switching and Add new Occupancy Sensor	\$45	\$680	0.55	15.2	476.3
19	Lighting - Controls Retrofit: Locker rooms	Remove Manual Switching and Add new Occupancy Sensor	\$111	\$2,000	0.54	18.0	1,182.0
20	Lighting - Power Retrofit: Chemical room	Replace with 3 LED 14W Module	\$3	\$103	0.43	33.3	32.9
21	Lighting - Power Retrofit: Boiler room - other	Replace with 3 LED 4W Module	\$3	\$83	0.31	26.9	32.9
22	Lighting - Power Retrofit: AHU Fan & EF Fan rooms - CFL	Replace with 6 LED 10W Module	\$1	\$42	0.28	50.7	8.7
23	Lighting - Controls Retrofit: Small office off lobby	Remove Manual Switching and Add new Occupancy Sensor	\$4	\$170	0.18	47.5	38.1
24	Cathedral Ceiling: House	Add R-19 to existing insulation.	\$148	\$39,723	0.09	269.3	1,088.5
25	Lighting - Combined Retrofit: Vestibule	Replace with LED 10W Module and Improve Manual Switching	-\$6	\$7	-7.67	999.9	-68.1
	TOTAL, all measures		\$27,972 + \$1,371 Maint. Savings	\$343,719	1.33	11.7	224,757.9

4.2 *Interactive Effects of Projects*

The savings for a particular measure are calculated assuming all EEM's listed above that measure have been implemented. If some EEM's are not implemented, savings for the remaining EEM's will be affected. For example, if ceiling insulation is not added, then savings from a project to replace the heating system will be increased, because the heating system for the building will be serving a larger load and consuming more energy.

In general, all projects are evaluated sequentially so energy savings associated with one EEM would not also be attributed to another EEM. By modeling the recommended project sequentially, the analysis accounts for interactive affects among the EEMs and does not "double count" savings.

Interior lighting, plug loads, facility equipment, and occupants generate heat within the building. When the building is in cooling mode, these items contribute to the overall cooling demands of the building. Therefore, lighting efficiency improvements will reduce cooling requirements in air-conditioned buildings and conversely, they will increase heating requirements in a heated building. Heating penalties and cooling benefits were included in the lighting project analysis.

4.3 EEM Detail with Auditors Notes (only EEM's calculated inside AkWarm© are shown)

4.3.1 Insulation Measures (*considered but not recommended*)

Rank	Location	Existing Type/R-Value			Recommendation Type/R-Value	
24	Cathedral Ceiling: House	Framing Type: Standard Framing Spacing: 24 inches Insulated Sheathing: None Bottom Insulation Layer: XPS (Blue/Pink Foam), 3 inches Top Insulation Layer: None Modeled R-Value: 17.8			Add R-19 to existing insulation.	
Installation Cost		\$39,723	Estimated Life of Measure (yrs)	30	Energy Savings (/yr)	\$148
Breakeven Cost		\$3,497	Savings-to-Investment Ratio	0.1	Simple Payback yrs	269
Auditors Notes: This EEM adds 4" (approx. R-20) additional rigid foam during roof replacement - cost of roof replacement is not included here. Eagle Contracting (roof vendor quoted the project in 2015) estimated \$7.50/SF for additional 4" of rigid foam during replacement; structural engineering may be required for fastening system specification.						

4.3.2 Window Measures (There were no improvements in this category)

4.3.3 Door Measures (There were no improvements in this category)

4.3.4 Air Sealing Measures (There were no improvements in this category)

4.3.5 Heating/Cooling/Domestic Hot Water Measure

Rank	Recommendation
2	1.) add DHW re-circulation pump timers to CP-5 & CP-7 (HWG circulation pump and DHW re-circulation pump) to reduce HWG & DHW circulation to the only when pool is open.
Installation Cost \$1,000 Estimated Life of Measure (yrs) 20 Energy Savings (/yr) \$800	
Breakeven Cost \$13,059 Savings-to-Investment Ratio 13.1 Simple Payback yrs 1	
Auditors Notes:	

4.3.6 Ventilation System Measures

Rank	Description			Recommendation		
1				1.) Add schedule controls to AHU-2 reduce operating hours to when building is occupied. Estimated cost \$4,000 2.) replace EF's in locker rooms with humidity sensing models, reduce operation by 65%. Estimated cost \$600. 3.) replace AHU-1, EF-1 & EF-2 with Desertair system used to de-humidify, then heat the space, OSA and pool water with recovered heat. Cost is included in EEM#XXX. Pool water heat savings is identified under EEM #X.		
Installation Cost		\$4,600	Estimated Life of Measure (yrs)	15	Energy Savings (/yr)	\$7,670
Breakeven Cost		\$90,524	Savings-to-Investment Ratio	19.7	Simple Payback yrs	1
Auditors Notes:						

4.3.7 Night Setback Thermostat Measures

Rank	Building Space			Recommendation		
14	Locker rooms			Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Locker rooms space.		
Installation Cost		\$300	Estimated Life of Measure (yrs)	15	Energy Savings (/yr)	\$25
Breakeven Cost		\$339	Savings-to-Investment Ratio	1.1	Simple Payback yrs	12
Auditors Notes:						

4.3.8 Lighting Measures

Rank	Location	Existing Condition	Recommendation			
3	Lobby night light	FLUOR (4) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with LED (4) 14W Module			
Installation Cost		\$154	Estimated Life of Measure (yrs)	6	Energy Savings (/yr)	\$152
					Maintenance Savings (/yr)	\$5
Breakeven Cost		\$847	Savings-to-Investment Ratio	5.5	Simple Payback yrs	1
Auditors Notes: Remove ballast in (1) fixture, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (4) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Maintenance savings \$5/fixture						

Rank	Location	Existing Condition	Recommendation			
4	Locker rooms, night lights	4 FLUOR (2) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with 4 LED (21) 14W Module			
Installation Cost		\$375	Estimated Life of Measure (yrs)	6	Energy Savings (/yr)	\$333
					Maintenance Savings (/yr)	\$16
Breakeven Cost		\$1,883	Savings-to-Investment Ratio	5.0	Simple Payback yrs	1
Auditors Notes: Remove ballast in (4) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (8) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Maintenance savings \$5/fixture						

Rank	Location	Existing Condition	Recommendation
5	Boiler room - turned on all day	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Replace with 3 LED 14W Module
Installation Cost	\$83	Estimated Life of Measure (yrs)	10
Energy Savings (/yr)			\$47
Breakeven Cost	\$392	Savings-to-Investment Ratio	4.7
Simple Payback yrs			2
Auditors Notes: Replace 3 (turned on every day) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr. Add (1) ceiling mounted occupancy sensor @ \$125 parts + \$45 labor.			

Rank	Location	Existing Condition	Recommendation
6	Lobby, offices, laundry	5 FLUOR (4) T12 4' F40T12 40W Standard (2) Magnetic with Manual Switching	Replace with 5 LED (4) 14W Module (2)
Installation Cost	\$769	Estimated Life of Measure (yrs)	12
Energy Savings (/yr)			\$290
			Maintenance Savings (/yr)
			\$20
Breakeven Cost	\$3,021	Savings-to-Investment Ratio	3.9
Simple Payback yrs			2
Auditors Notes: Remove ballast in (5) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (20) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Maintenance savings \$5/fixture			

Rank	Location	Existing Condition	Recommendation
7	Locker rooms	21 FLUOR (2) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with 21 LED (21) 14W Module
Installation Cost	\$1,968	Estimated Life of Measure (yrs)	12
Energy Savings (/yr)			\$521
			Maintenance Savings (/yr)
			\$105
Breakeven Cost	\$6,115	Savings-to-Investment Ratio	3.1
Simple Payback yrs			3
Auditors Notes: Remove ballast in (21) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (42) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) ceiling mounted occupancy sensors in EACH locker room @ \$125 ea parts + 1 hr labor each @ \$125/hr (requires electrician). Maintenance savings \$5/fixture. Datalogging showed mens locker to be unoccupied 83% when lights were on and 62% in womens locker.			

Rank	Location	Existing Condition	Recommendation
8	Natorium	18 MH 400 Watt Magnetic with Manual Switching	Replace with 18 LED 119W Module and Remove Manual Switching and Add new Occupancy Sensor
Installation Cost	\$13,560	Estimated Life of Measure (yrs)	22
Energy Savings (/yr)			\$2,355
			Maintenance Savings (/yr)
			\$180
Breakeven Cost	\$39,249	Savings-to-Investment Ratio	2.9
Simple Payback yrs			5
Auditors Notes: Replace (18) 400w MH fixtures with 119w LED's with integral dimming occupancy sensors @ \$450 ea parts + 2 hrs labor ea @ \$110/hr + \$1500 lift rental. Maintenance savings \$10/fixture.			

Rank	Location	Existing Condition	Recommendation
9	Offices, laundry & family bathroom	5 FLUOR (4) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Replace with 5 LED (4) 14W Module
Installation Cost	\$837	Estimated Life of Measure (yrs)	10
Energy Savings (/yr)			\$225
			Maintenance Savings (/yr)
			\$20
Breakeven Cost	\$2,058	Savings-to-Investment Ratio	2.5
Simple Payback yrs			3

Auditors Notes: Remove ballast in (7) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (20) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) switch mounted occupancy sensors in family bathroom and laundry room and ceiling mounted sensors in office @ \$125 ea parts + 1 hr labor @ \$45/hr. Maintenance savings \$5/fixture

Rank	Location	Existing Condition	Recommendation
10	Small office off lobby	FLUOR (2) CFL, A Lamp 20W with Manual Switching	Replace with LED (2) 10W Module
Installation Cost	\$14	Estimated Life of Measure (yrs)	10
Breakeven Cost	\$31	Savings-to-Investment Ratio	2.2
		Energy Savings (/yr)	\$4
		Simple Payback yrs	4
Auditors Notes: Replace (2) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost. Add fixture mounted occupancy sensor @ \$125 parts + 1 hr labor @ \$45.			

Rank	Location	Existing Condition	Recommendation
11	AHU Fan & EF Fan rooms - Incand	3 INCAN A Lamp, Std 60W with Manual Switching	Replace with 3 LED 10W Module
Installation Cost	\$21	Estimated Life of Measure (yrs)	20
Breakeven Cost	\$44	Savings-to-Investment Ratio	2.1
		Energy Savings (/yr)	\$3
		Simple Payback yrs	7
Auditors Notes: Replace (3) 60w incandescent bulbs with 9.5w LED's @ \$7ea and no labor cost.			

Rank	Location	Existing Condition	Recommendation
12	Exterior	4 MH 175 Watt Magnetic with Manual Switching	Replace with 4 LED 56W Module
Installation Cost	\$1,780	Estimated Life of Measure (yrs)	11
		Energy Savings (/yr)	\$287
		Maintenance Savings (/yr)	\$20
Breakeven Cost	\$2,800	Savings-to-Investment Ratio	1.6
		Simple Payback yrs	6
Auditors Notes: Replace (4) 175w MH fixtures with 56w LED fixtures @ \$400 ea + 1 hr labor each @ \$45/hr. \$5/fixture maintenance savings.			

Rank	Location	Existing Condition	Recommendation
13	Storage rooms	3 INCAN A Lamp, Std 60W with Manual Switching	Replace with 3 LED 10W Module
Installation Cost	\$21	Estimated Life of Measure (yrs)	10
Breakeven Cost	\$24	Savings-to-Investment Ratio	1.1
		Energy Savings (/yr)	\$3
		Simple Payback yrs	7
Auditors Notes: Replace (3) 60w incandescent bulbs with 9.5w LED's @ \$7ea and no labor cost.			

Rank	Location	Existing Condition	Recommendation
16	Storage area off lobby	FLUOR (2) T8 4' F32T8 32W Standard Instant with Manual Switching	Replace with LED (2) 14W Module and Remove Manual Switching and Add new Occupancy Sensor
Installation Cost	\$264	Estimated Life of Measure (yrs)	10
		Energy Savings (/yr)	\$21
		Maintenance Savings (/yr)	\$5
Breakeven Cost	\$218	Savings-to-Investment Ratio	0.8
		Simple Payback yrs	10
Auditors Notes: Remove ballast in (1) fixture, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (2) 32w T8 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add fixture mounted occupancy sensor @ \$125 parts + 1 hr labor @ \$45. Maintenance savings \$5/fixture			

Rank	Location	Existing Condition	Recommendation
20	Chemical room	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Replace with 3 LED 14W Module
Installation Cost	\$103	Estimated Life of Measure (yrs)	20
		Energy Savings (/yr)	\$3
Breakeven Cost	\$45	Savings-to-Investment Ratio	0.4
		Simple Payback yrs	33
Auditors Notes: Replace 4 (only 3 working during survey) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr.			

Rank	Location	Existing Condition	Recommendation
21	Boiler room - other	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Replace with 3 LED 4W Module
Installation Cost	\$83	Estimated Life of Measure (yrs)	10
		Energy Savings (/yr)	\$3
Breakeven Cost	\$26	Savings-to-Investment Ratio	0.3
		Simple Payback yrs	27
Auditors Notes: Replace 3 (only 2 working during survey) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr.			

Rank	Location	Existing Condition	Recommendation
22	AHU Fan & EF Fan rooms - CFL	6 FLUOR CFL, A Lamp 20W with Manual Switching	Replace with 6 LED 10W Module
Installation Cost	\$42	Estimated Life of Measure (yrs)	20
		Energy Savings (/yr)	\$1
Breakeven Cost	\$12	Savings-to-Investment Ratio	0.3
		Simple Payback yrs	51
Auditors Notes: Replace (6) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost.			

Rank	Location	Existing Condition	Recommendation
25	Vestibule	FLUOR CFL, A Lamp 20W with Manual Switching	Replace with LED 10W Module and Improve Manual Switching
Installation Cost	\$7	Estimated Life of Measure (yrs)	10
Breakeven Cost	-\$54	Savings-to-Investment Ratio	-7.7
		Energy Savings (/yr)	-\$6
		Simple Payback yrs	1000
Auditors Notes: Replace (1) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost. This lamp was burned out, so there will be negative savings from this EEM.			

Rank	Location	Existing Condition	Recommendation
17	Boiler room - turned on all day	3 INCAN Reflector, Std 65W BR30 with Manual Switching	Improve Manual Switching
Installation Cost	\$165	Estimated Life of Measure (yrs)	10
Breakeven Cost	\$96	Savings-to-Investment Ratio	0.6
		Energy Savings (/yr)	\$11
		Simple Payback yrs	14
Auditors Notes: Replace 3 (turned on every day) - 65w PAR36 lamps with 9.5w LED @ \$20 ea + total .5 hr labor @ \$45/hr. Add (1) ceiling mounted occupancy sensor @ \$125 parts + \$45 labor.			

Rank	Location	Existing Condition	Recommendation
18	Offices, laundry & family bathroom	5 FLUOR (4) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Remove Manual Switching and Add new Occupancy Sensor
Installation Cost	\$680	Estimated Life of Measure (yrs)	10
Breakeven Cost	\$375	Savings-to-Investment Ratio	0.6
		Energy Savings (/yr)	\$45
		Simple Payback yrs	15
Auditors Notes: Remove ballast in (7) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (20) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) switch mounted occupancy sensors in family bathroom and laundry room and ceiling mounted sensors in office @ \$125 ea parts + 1 hr labor @ \$45/hr. Maintenance savings \$5/fixture			

Rank	Location	Existing Condition	Recommendation
19	Locker rooms	21 FLUOR (2) T12 4' F40T12 40W Standard Magnetic with Manual Switching	Remove Manual Switching and Add new Occupancy Sensor
Installation Cost	\$2,000	Estimated Life of Measure (yrs)	12
Breakeven Cost	\$1,082	Savings-to-Investment Ratio	0.5
		Energy Savings (/yr)	\$111
		Simple Payback yrs	18
Auditors Notes: Remove ballast in (21) fixtures, re-wire end caps @ .75 hrs ea @ \$45/hr; replace (42) 40w T12 lamps with 14w T8 LED tubes @ \$30 ea, labor included in re-wire time. Add (4) ceiling mounted occupancy sensors in EACH locker room @ \$125 ea parts + 1 hr labor each @ \$125/hr (requires electrician). Maintenance savings \$5/fixture. Datalogging showed mens locker to be unoccupied 83% when lights were on and 62% in womens locker.			

Rank	Location	Existing Condition	Recommendation
23	Small office off lobby	FLUOR (2) CFL, A Lamp 20W with Manual Switching	Remove Manual Switching and Add new Occupancy Sensor
Installation Cost	\$170	Estimated Life of Measure (yrs)	10
Energy Savings (/yr)			\$4
Breakeven Cost	\$30	Savings-to-Investment Ratio	0.2
Simple Payback yrs			47
Auditors Notes: Replace (2) 23w CFL bulbs with 9.5w LED's @ \$7ea and no labor cost. Add fixture mounted occupancy sensor @ \$125 parts + 1 hr labor @ \$45.			

4.3.9 Refrigeration Measures (There were no improvements in this category)

4.3.10 Other Electrical Measures (There were no improvements in this category)

4.3.11 Cooking Measures (There were no improvements in this category)

4.3.12 Clothes Drying Measures (There were no improvements in this category)

4.3.13 Other Measures

Rank	Location	Description of Existing	Efficiency Recommendation
15		Natatorium de-humidification and ventilation	De-Commission AHU-1, EF-1,2 & 3 and Install Desertair system to ventilate and de-humidify natatorium and for chloramine extraction, use recovered heat to heat space and pool water. Estimated costs are \$150,000 for parts, \$100,000 for mechanical, electrical & general contracting, \$25,000 for engineering.
Installation Cost	\$275,000	Estimated Life of Measure (yrs)	20
Energy Savings (/yr)			\$14,917
			Maintenance Savings (/yr)
			\$1,000
Breakeven Cost	\$292,746	Savings-to-Investment Ratio	1.1
Simple Payback yrs			17
Auditors Notes:			

APPENDICES

Appendix A – Major Equipment List

ALL SCHEDULES COMPILED FROM PLANS OR ON-SITE NAMEPLATE OBSERVATION, WHERE
ACCESSIBLE e= estimated

AIR HANDLER SCHEDULE

SYMBOL	MFGR/MODEL	FAN CFM	MOTOR DATA HP/VOLTS/PH	REMARKS
AHU-1	unknown, no nameplate	12,000	10/208/3	Natatorium; on "hand"
AHU-2	unknown, no nameplate	2,070	1.5/208/1	Lobby & offices; on mechanical time clock

EXHAUST FAN SCHEDULE

SYMBOL	MOTOR MFGR/MODEL	CFM	MOTOR DATA HP/VOLTS/PH	REMARKS
EF-1	unknown, Dayton motor, south fan	3850	.5/115/1	Natatorium exhaust, located in clearstory fan room; controlled by humidistat; HOA switch on "auto"
EF-2	unknown, Dayton motor, middle fan	4500	.5/115/1	Natatorium exhaust, located in clearstory fan room; controlled by humidistat; HOA switch on "auto"
EF-3	unknown, Dayton motor, north fan	9600*	.5/115/1	Natatorium exhaust, located in clearstory fan room; controlled by humidistat; HOA switch "off"
EF-4	Brod & McClung-Pace Co, model SCF-114-AMI	2200	1/208/1	Locker rooms, toilet rooms, laundry room - no longer in use; SN 84-46958- 01
EF-5	Panasonic	e150	e85W/115/1	Women's locker; added to compensate for lack of EF-1
EF-6	Panasonic	e150	e85W/115/1	Men's locker; added to compensate for lack of EF-1
EF-7	Panasonic FV-08WQ1	e100	.14A/115/1	Chemical room
EF-8	unknown	e250	.08/115/1	Electrical room, manual wall switch

* no matter what order fans are turned on, the first fan turned on pulls approx. 3800 cfm, second fan turned on pulls approx. 4500cfm, third fan turned on pulls approx. 9600 cfm

PUMP SCHEDULE

SYMBOL	MFGR/MODEL	GPM @ HD	MOTOR DATA HP/VOLTS/PH	REMARKS
CP-1	Grundfos UP 43-75	36 @ 4'	215W/115/1	circ pump for heating coil in AHU-2
CP-2	Grundfos UMC 80-80	175 @ 15'	1000W/208/3	circ pump for AHU-1 main heating coil; on "hand"

CP-3	Grundfos UPS 50-80	40 @ 28'	610W/115/1	circ pump for AHU-1 pre-heat coil; on "hand"
CP-4	Grundfos UPS 50-160	80 @ 40'	1300w/208/3	main building heat circulation, located at HWG
CP-5	Grundfos 40-80/4	30 @ 25'	565W/208/1	HWG circulation pump
CP-6	Grundfos UPS 80-160 double	130 @ 40'	2050W/208/3	Main building heat circulation, located at boiler
CP-7	Grundfos UPS 15-58	8 @ 8'	80W/115/1	DHW circulation
CP-8	Grundfos UPS 32-80	40 @ 15'	280W/115/1	pool heat exchanger circulation pump
P-1	G&L Model SSH 23SH2J5F0; Baldor motor	433	5/208/3/87.5%, .78 PF	pool water circulation pump

BOILER SCHEDULE

SYMBOL	MFGR/MODEL	EFFICIENCY	MOTOR DATA HP/VOLTS/PH	REMARKS
B-1	Viessman VD2-700	88%	1.5/208/3 burner	Oil fired, Vitorond 200, 3,059 MBH input, 2,693 MBH output, 88% EFF, 35% max. turndown, 180F set point; SN 7134287500010103, mfg 2005; Riello RL burner, SN 06D 951430000001, 5.4-22.4 GPH

UNIT HEATER SCHEDULE

SYMBOL	MFGR/MODEL	CFM	MOTOR DATA HP/VOLTS/PH	REMARKS
UH-1	Dunham Bush model H-250-C, 20 MBH	e600	.05/115/1	Women's Locker room; manual thermostat; SN 930105306
UH-2	Dunham Bush model H-250-C, 20 MBH	e600	.05/115/1	Men's Locker room; manual thermostat
UH-3	Trane, model S-CU, size 42S, 15 MBH	590	e.17/115/1	Chemical room; manual thermostat; SN 1H-01344

HEAT EXCHANGER SCHEDULE

HX-1	unknown, shell & tube			pool water heat
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HOT WATER HEATER SCHEDULE

SYMBOL	MFGR/MODEL	GALLONS	NUMBER OF ELEMENTS	ELEMENT SIZE
HWG-1	Viessman Vitocell 300			temperature setpoint 143F (62C)

HWG-2	Viessman Vitocell 300			temperature setpoint 134F (57C)
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PLUMBING FIXTURES				
SYMBOL	FIXTURE	GPF	QUANTITY	REMARKS
	W.C.	e3.0	1	flushometer, manual valve, family bath
	W.C.	e3.0	3	flushometer, manually operated
	Urinal	e1.0	1	flushometer, manually operated
	Showers (6 per pole)	1.5	4	measured gpm in men's locker, measured 107F water temp – it is a assumed women's locker has same head configuration and water temp.
	Showers (6 per pole)	4.0	8	
	Lavatory	2.1	1	measured, family bath
	Lavatory	1.5	2	measured gpm in mens locker; assume womens same

PLUG LOAD SUMMARY				
SYMBOL	FIXTURE	QUANTITY	ESTIMATED CONSUMPTION	REMARKS
	Laptop	1	85w	
	Personal printers	2	85w	
	Personal fan	1	85w	pool office
	Microwaves	1	1000w	
	half size refrigerators (under counter)	1	225 kWh/yr	
	Colorado Lane Systems lane timer/display, model LED-R	6	230W/115/1	6-lanes
	Maytag clothes washer, model A7300	1	7A/115/1	SN 141127 DW
	GE electric clothes dryer, model DX4500EA0WW	1	4.4kW/208/1	SN MZ742012A
	Electric hand dryer, model MT103	2	20A/208/1	
	TV - flat screen	1	50w	lobby
POOL EQUIPMENT				
	Model EUV396 UV water purifier	1	574W/120/1	runs 24/7/365; SN 126168
	Dolphin Dynamic Pool cleaner	1		runs 8 hrs/day, 5 days/wk
	SuitMate, swimsuit water extractor	1	8.6A/115/1	SN 71456
	TMI Salt Pure, water sanitizing system, model NV8	1	15A/208/1	SN 120063, mfg 2013; 16.2 lbs/hr max salt output

Appendix B – Benchmark Analysis

A benchmark analysis evaluates historical raw consumption and cost data for each energy type. The purpose of a benchmark analysis is to identify trends, anomalies and irregularities which may provide insight regarding the building's function and efficiency and to create a baseline for the facility. 36-48 months of historical data is usually a sufficient period of time to gain an understanding of the building operation.

Electric consumption and cost data from 2013 through 2015 were available as was fuel oil cost data for the same period. The fuel oil costs were provided via accounting ledgers and only some of the entries had the number of gallons delivered. Section 1.4 above describes the source of price per gallon used to calculate the missing delivered gallons data.

Figure B.1 shows less than a 6% year over year change in electric consumption and other than the previously mentioned (in Section 1.2) 4692 gallon reduction in oil use from 2013 to 2014, oil consumption in 2014 and 2015 varies by less than 3%

Figure B.1 – Total Building Energy Costs

	Elec. Consumption (kWh)	Cost	Elec. Demand (kW)	Cost	Total Electric Cost	Fuel Oil consumption (gal)	Cost	Total Cost	Total kBTU's
2013	145,521	\$17,313	327.8	\$2,809	\$20,842	23,904	\$97,219	\$118,061	3,651,954
2014	136,796	\$16,991	326.4	\$2,797	\$19,875	19,212	\$73,034	\$92,909	3,002,921
2015	142,796	\$16,754	320.9	\$2,772	\$20,485	19,802	\$59,241	\$79,725	3,101,261
3-year average	141,704	\$17,019	325	\$2,793	\$20,401	20,973	\$76,498	\$96,898	3,252,045

Figure(s) B.2 – 36 Months of Electric Consumption and Demand

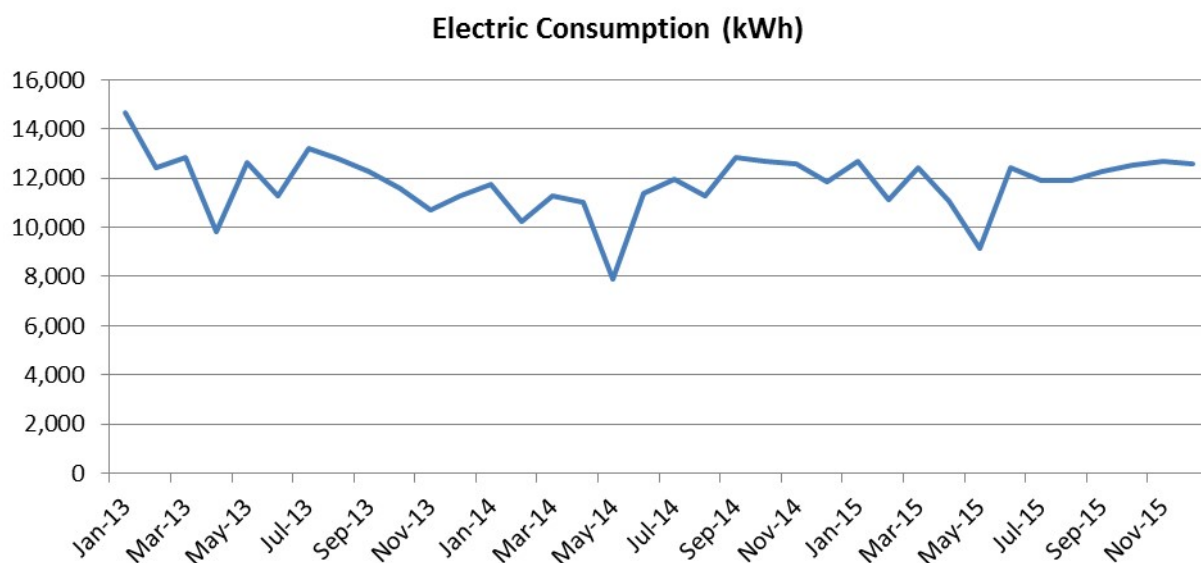


Figure B.2b
Electric Demand (kW)

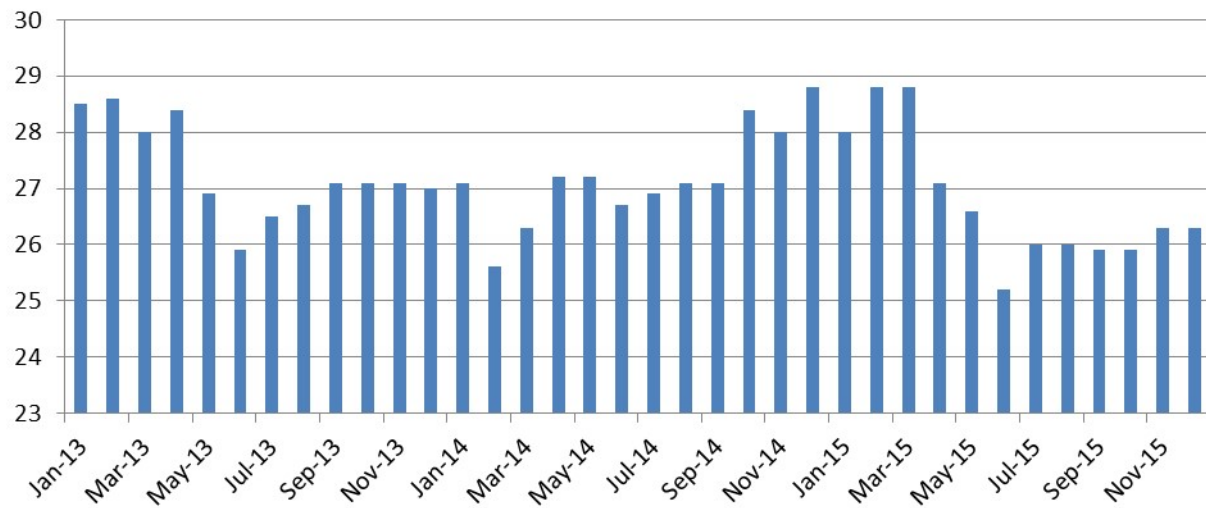


Figure B.2a shows consistent reduced consumption (i.e. downward) spikes in electric consumption in May of each year. This corresponds to the pool's annual shut down for maintenance. Figure B.2b shows higher demand during the winter months, which corresponds to higher light use during the darker period of the year.

Figure B.3 – 3 years of Electric Consumption

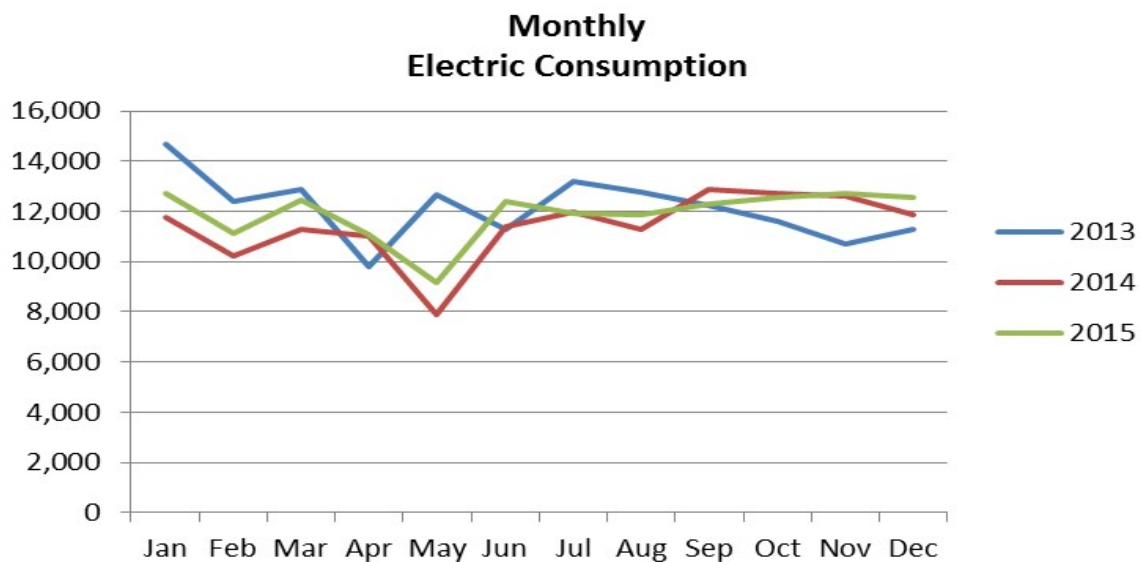


Figure B.3 shows little seasonal variation (other than the May shut down) and a very consistent year over year pattern.

Figure B.4

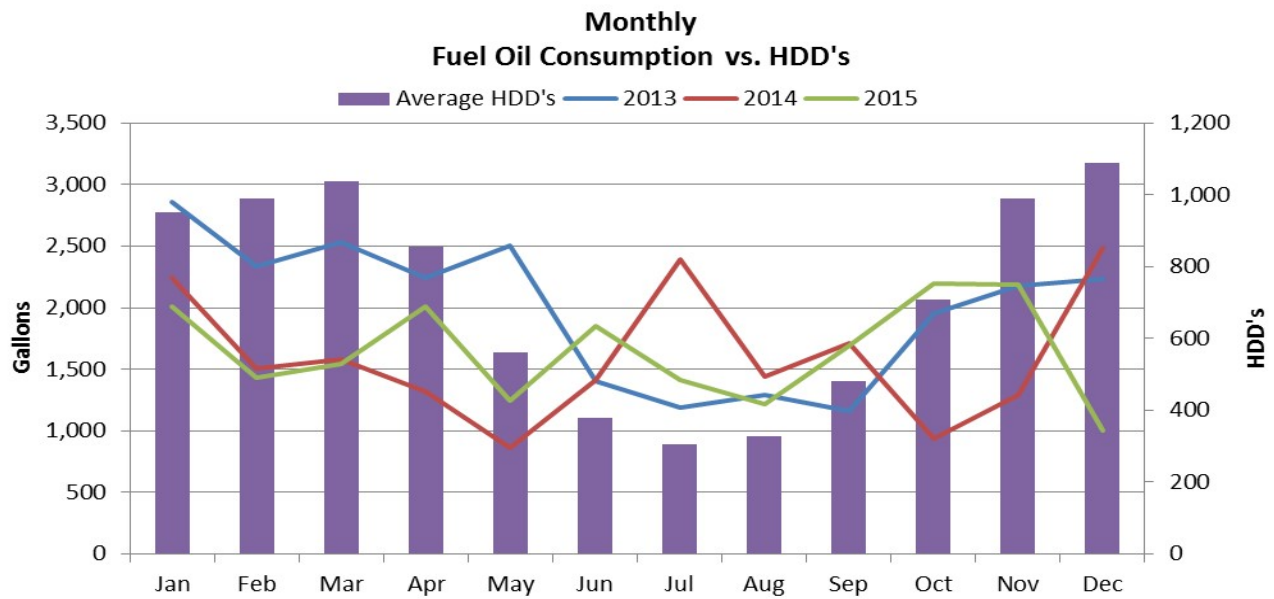


Figure B.4 shows monthly fuel oil deliveries and heating degree days (HDD's). Despite the fact that the chart represents deliveries and not consumption, the deliveries closely parallel HDD's. It is not possible to ascertain any additional insights without metering the day tank in the building.

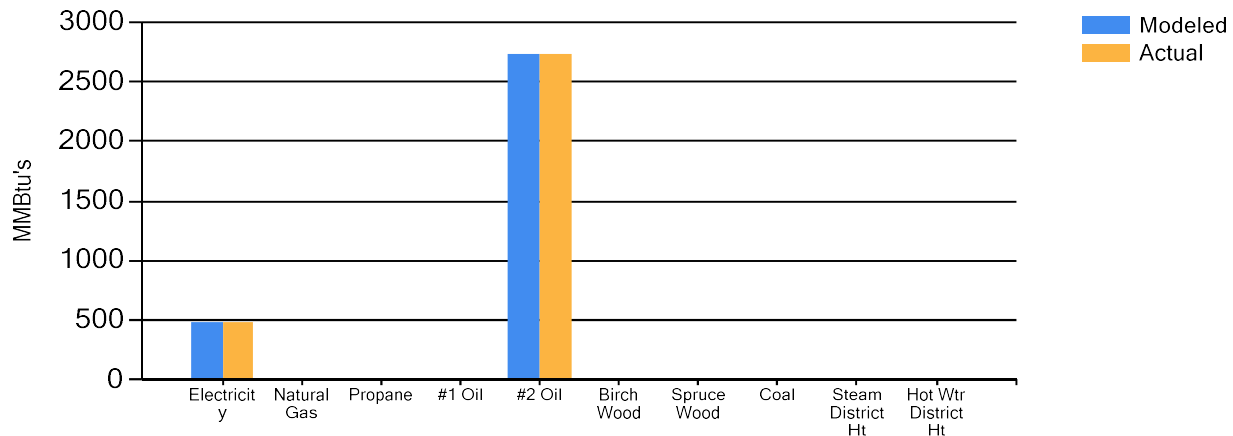
After performing the historical analysis above, a baseline period is selected, based on factors including the consistency of the data, the periods for which data was available and the current use and occupancy of the building versus its historical use and occupancy. The baseline period selected for electric consumption in this building is 2015. Figure B.6 tabulates these figures.

Figure B.6 – Baseline Energy Consumption and Costs

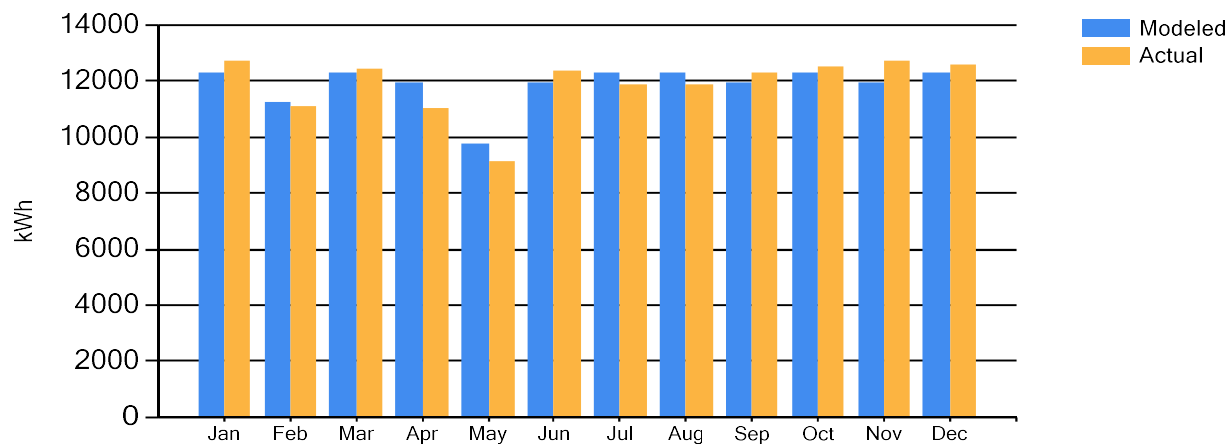
Used to Calibrate AkWarm					
	Elec (kWh)	Elec (kW)	Elec Cost	Oil (gallons)	Oil Cost
Jan	12,709	28	\$1,806	2,014	7087.52
Feb	11,116	28.8	\$1,639	1,431	5035.43
Mar	12,442	28.8	\$1,784	1,540	5389.04
Apr	11,048	27.1	\$1,617	2,013	7044.98
May	9,162	26.6	\$1,406	1,244	3732
Jun	12,403	25.2	\$1,749	1,852	5554.84
Jul	11,904	26	\$1,701	1,414	4241.44
Aug	11,886	26	\$1,699	1,218	3106
Sep	12,288	25.9	\$1,742	1,690	4310.23
Oct	12,554	25.9	\$1,771	2,196	5599.1
Nov	12,712	26.3	\$1,792	2,190	5585.42
Dec	12,572	26.3	\$1,777	1,002	2554.66
Totals	142,796	321	\$20,485	19,802	\$59,241

The Orange bars below show Actual fuel use, and the Blue bars are AkWarm©'s prediction of fuel use.

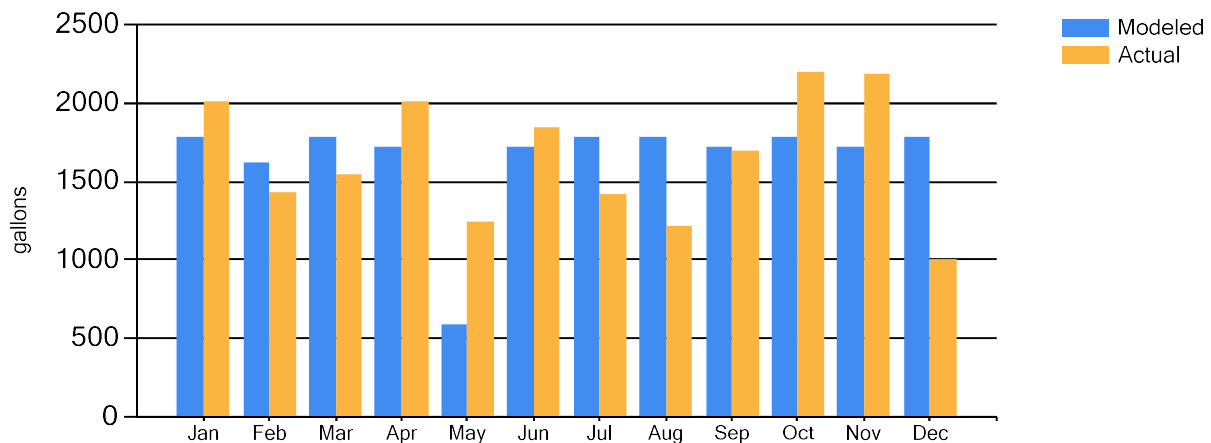
Annual Fuel Use



Electricity Fuel Use



#2 Fuel Oil Fuel Use ("Actual" monthly use is a normalized estimate based on weather conditions)



Raw Utility Data

Electric

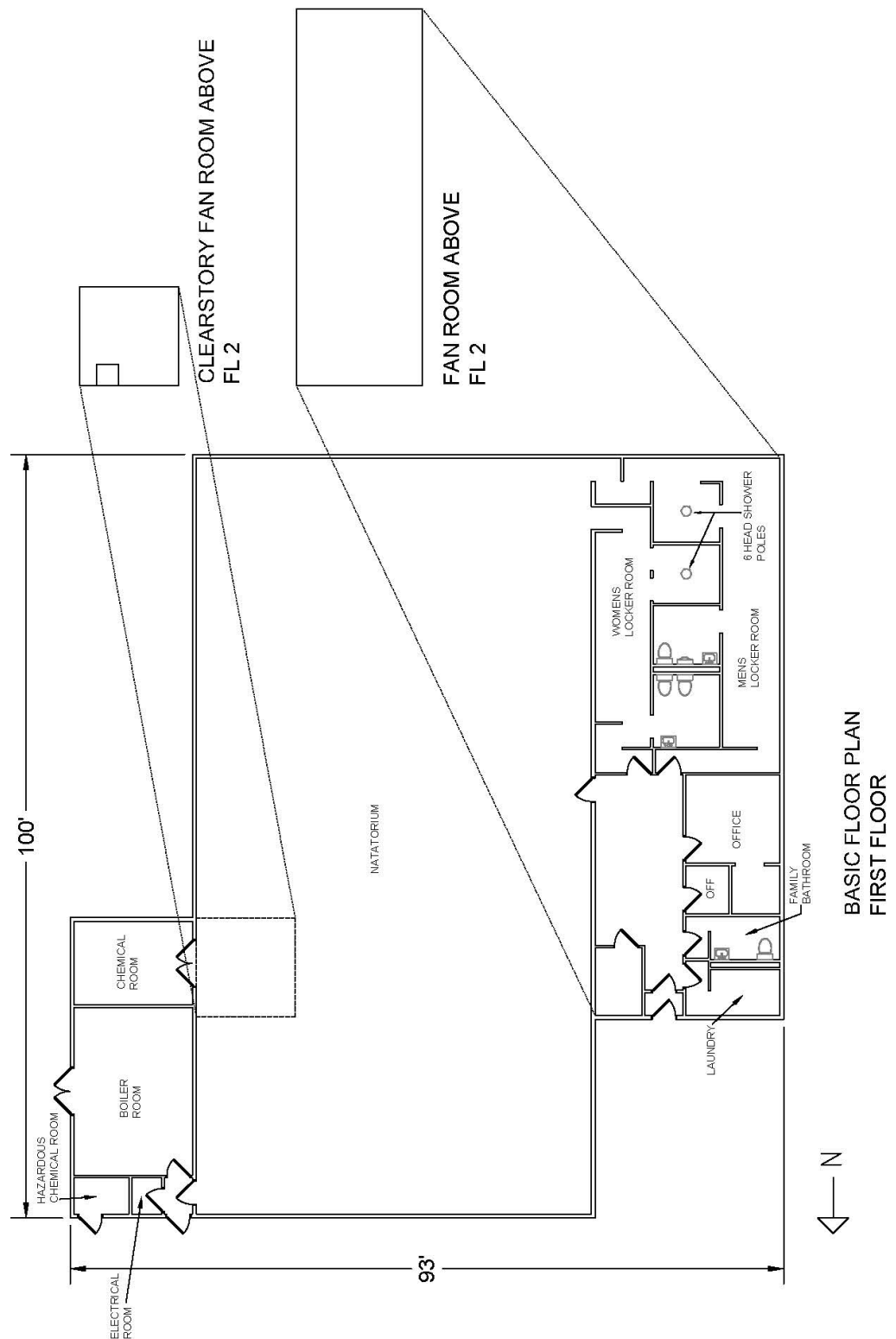
	ELECTRIC					
	kWh	Cost	kW	Cost	cust fees & tax	Total Elec Cost
Jan-13	14,683	\$1,722.64	28.5	\$244.25	\$60.00	\$2,026.88
Feb-13	12,410	\$1,473.77	28.6	\$245.10	\$60.00	\$1,778.87
Mar-13	12,850	\$1,521.94	28	\$239.96	\$60.00	\$1,821.90
Apr-13	9,800	\$1,188.00	28.4	\$243.39	\$60.00	\$1,491.39
May-13	12,661	\$1,501.25	26.9	\$230.53	\$60.00	\$1,791.78
Jun-13	11,290	\$1,351.14	25.9	\$221.96	\$60.00	\$1,633.10
Jul-13	13,190	\$1,559.17	26.5	\$227.11	\$60.00	\$1,846.27
Aug-13	12,788	\$1,515.15	26.7	\$228.82	\$60.00	\$1,803.97
Sep-13	12,264	\$1,457.78	27.1	\$232.25	\$60.00	\$1,750.03
Oct-13	11,613	\$1,386.50	27.1	\$232.25	\$60.00	\$1,678.75
Nov-13	10,698	\$1,286.32	27.1	\$232.25	\$60.00	\$1,578.57
Dec-13	11,274	\$1,349.39	27	\$231.39	\$60.00	\$1,640.78
Jan-14	11,743	\$1,400.74	27.1	\$232.25	\$60.00	\$1,692.99
Feb-14	10,245	\$1,236.72	25.6	\$219.39	\$60.00	\$1,516.11
Mar-14	11,274	\$1,349.39	26.3	\$225.39	\$60.00	\$1,634.78
Apr-14	11,025	\$1,322.12	27.2	\$233.10	\$60.00	\$1,615.23
May-14	7,877	\$977.45	27.2	\$233.10	\$60.00	\$1,270.55
Jun-14	11,400	\$1,363.18	26.7	\$228.82	\$60.00	\$1,652.00
Jul-14	11,968	\$1,425.37	26.9	\$230.53	\$60.00	\$1,715.91
Aug-14	11,261	\$1,347.96	27.1	\$232.25	\$60.00	\$1,640.21
Sep-14	12,858	\$1,522.82	27.1	\$232.25	\$60.00	\$1,815.07
Oct-14	12,708	\$1,506.40	28.4	\$243.39	\$60.00	\$1,809.78
Nov-14	12,588	\$1,493.26	28	\$239.96	\$60.00	\$1,793.22
Dec-14	11,849	\$1,412.34	28.8	\$246.82	\$60.00	\$1,719.16
Jan-15	12,709	\$1,506.51	28	\$239.96	\$60.00	\$1,806.47
Feb-15	11,116	\$1,332.09	28.8	\$246.82	\$60.00	\$1,638.90
Mar-15	12,442	\$1,477.27	28.8	\$246.82	\$60.00	\$1,784.09
Apr-15	11,048	\$1,324.64	27.1	\$232.25	\$60.00	\$1,616.89
May-15	9,162	\$1,118.15	26.6	\$227.96	\$60.00	\$1,406.11
Jun-15	12,403	\$1,473.00	25.2	\$215.96	\$60.00	\$1,748.97
Jul-15	11,904	\$1,418.37	26	\$222.82	\$60.00	\$1,701.19
Aug-15	11,886	\$1,416.40	26	\$222.82	\$60.00	\$1,699.22
Sep-15	12,288	\$1,460.41	25.9	\$221.96	\$60.00	\$1,742.37
Oct-15	12,554	\$1,489.53	25.9	\$221.96	\$60.00	\$1,771.50
Nov-15	12,712	\$1,506.83	26.3	\$225.39	\$60.00	\$1,792.22
Dec-15	12,572	\$1,491.51	26.3	\$225.39	\$60.00	\$1,776.90

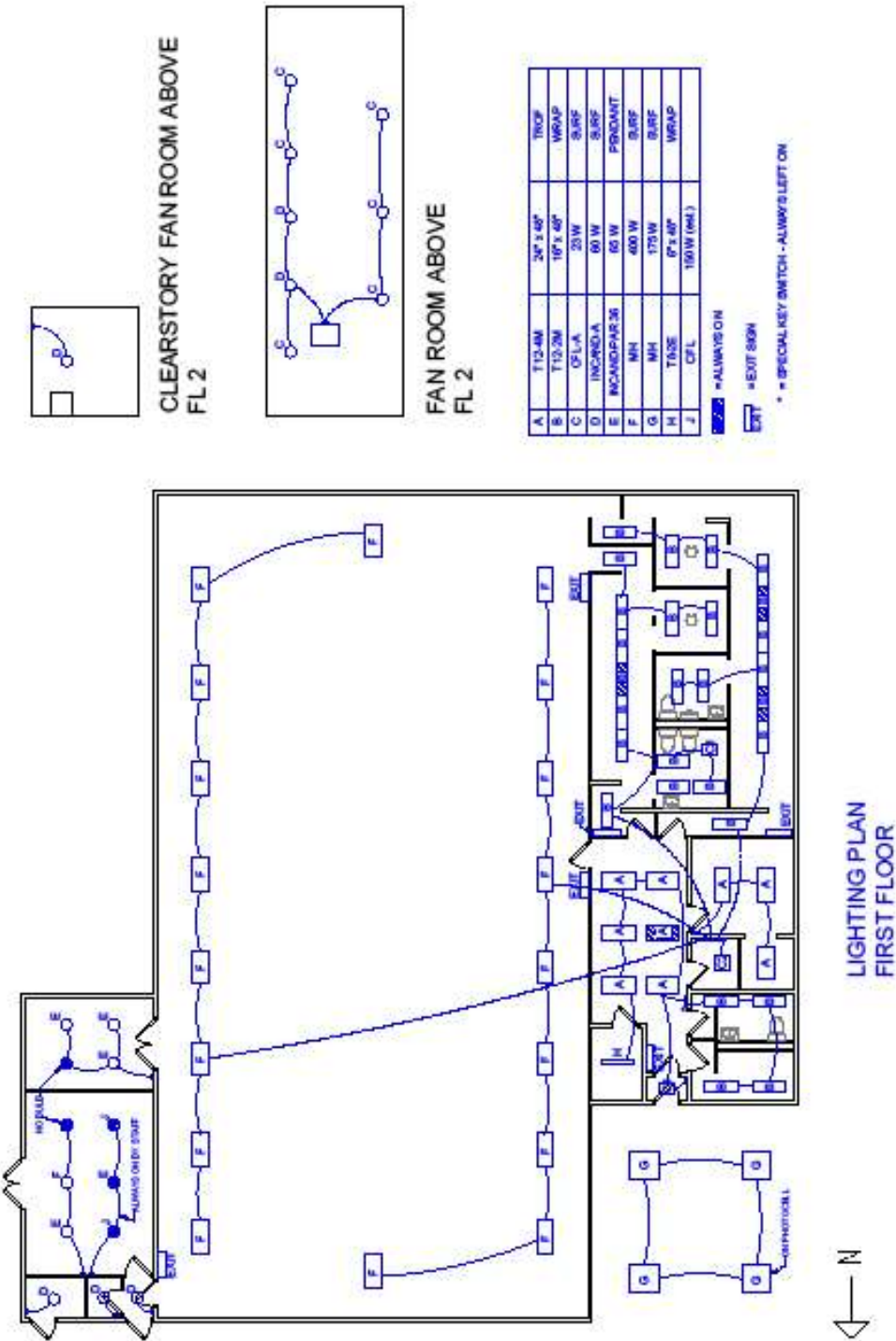
Fuel Oil

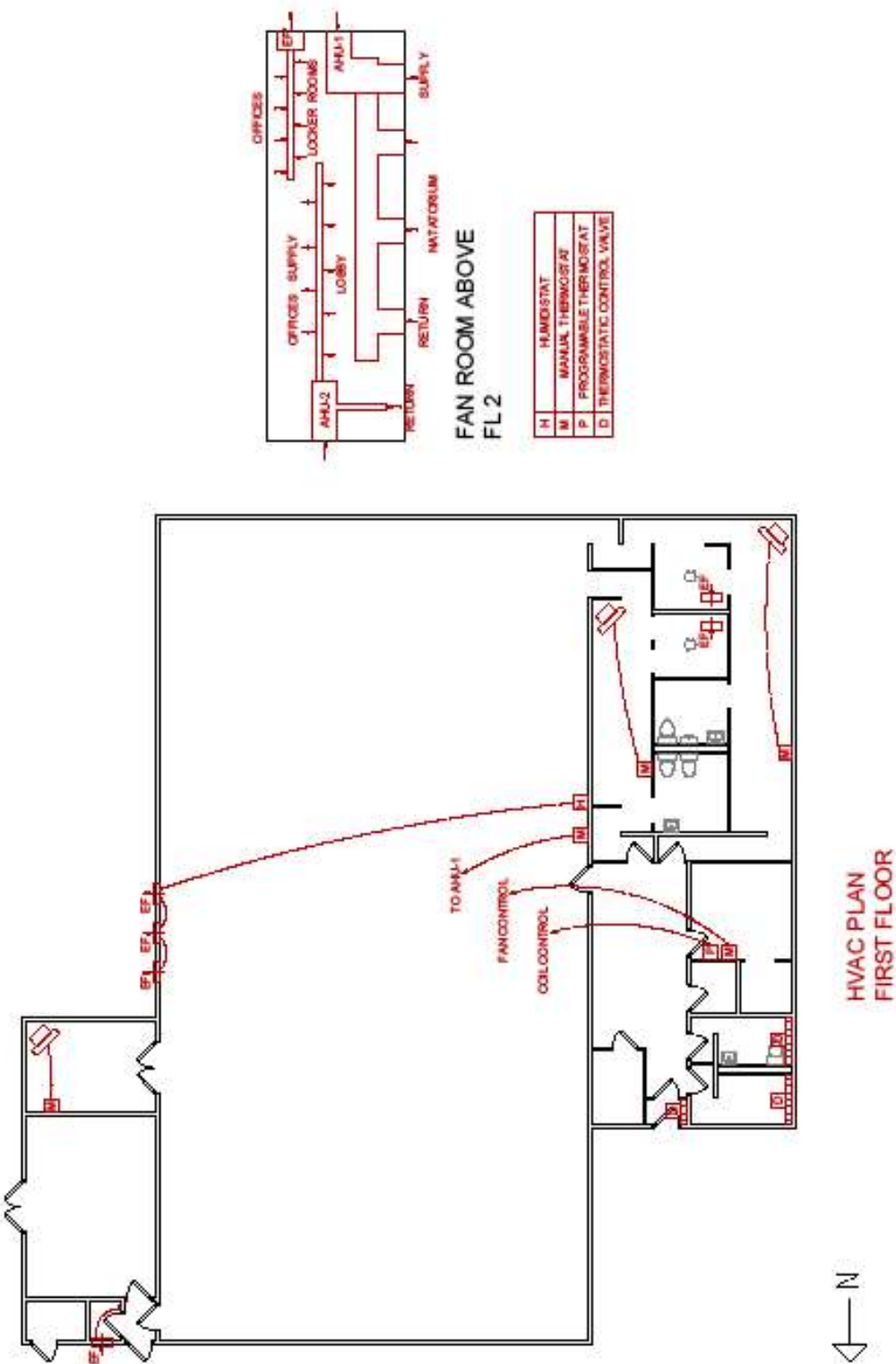
	gallons	Cost	cost/gallon	
Jan-13	2,862.4	\$11,650	\$4.07	
Feb-13	2,333.6	\$9,498	\$4.07	
Mar-13	2,532.9	\$10,309	\$4.07	
Apr-13	2,246.9	\$9,145	\$4.07	
May-13	2,501.3	\$10,180	\$4.07	
Jun-13	1,408.8	\$5,734	\$4.07	
Jul-13	1,186.7	\$4,830	\$4.07	
Aug-13	1,290.0	\$5,250	\$4.07	
Sep-13	1,165.3	\$4,743	\$4.07	
Oct-13	1,956.2	\$7,962	\$4.07	
Nov-13	2181.1	\$8,875	\$4.07	
Dec-13	2238.4	\$9,043	\$4.04	black is actual, from invoices, red is estimated
Jan-14	2248.3	\$9,218	\$4.10	
Feb-14	1511	\$6,195	\$4.10	
Mar-14	1586.1	\$6,444	\$4.06	
Apr-14	1,321.9	\$5,287	\$4.00	
May-14	859.1	\$3,436	\$4.00	
Jun-14	1,409.0	\$5,354	\$3.80	
Jul-14	2,397.5	\$9,111	\$3.80	
Aug-14	1,438.9	\$5,180	\$3.60	
Sep-14	1,712.9	\$6,166	\$3.60	
Oct-14	940.4	\$3,310	\$3.52	
Nov-14	1,296.1	\$4,562	\$3.52	
Dec-14	2,491.2	\$8,769	\$3.52	
Jan-15	2,013.5	\$7,088	\$3.52	
Feb-15	1,430.5	\$5,035	\$3.52	
Mar-15	1,539.7	\$5,389	\$3.50	
Apr-15	2,012.9	\$7,045	\$3.50	
May-15	1,244.0	\$3,732	\$3.00	
Jun-15	1,851.6	\$5,555	\$3.00	
Jul-15	1,413.8	\$4,241	\$3.00	
Aug-15	1,218.0	\$3,106	\$2.55	
Sep-15	1,690.3	\$4,310	\$2.55	
Oct-15	2,195.7	\$5,599	\$2.55	
Nov-15	2,190.4	\$5,585	\$2.55	
Dec-15	1,001.8	\$2,555	\$2.55	
				average cost for 2015
			\$ 2.99	

Appendix C – Building Schematics

(these are schematics based on building plans, observed information & assumptions)







Appendix D – Additional EEM and ECM Detail

D.1 EEM Cost Estimates

Installed costs for the recommended EEM's in this audit include the labor and equipment required to implement the EEM retrofit, but design and construction management costs are excluded. Cost estimates are typically +/- 30% for this level of audit, and are derived from one or more of the following:

- The labor costs identified below
- Means Cost Data
- Industry publications
- The experience of the auditor
- local contractors and equipment suppliers

Labor rates used:

Certified Electrician

\$125/hr

This level of work includes changing street light heads, light fixtures, running new wires for ceiling or fixture-mounted occupancy and/or daylight harvesting sensors, etc.

Common mechanical & electrical work

\$ 45/hr

Includes installing switch mounted occupancy sensors which do not require re-wire or pulling additional wires, replacing ballasts and re-wiring light fixtures, replacing florescent lamps and fixtures, replacing exterior HID wall packs with LED wall packs, replacing doors, repairing damaged insulation, etc.

Certified mechanical work

\$125/hr

Work includes boiler replacement, new or modified heat piping and/or ducting, adding or modifying heat exchangers, etc.

Non-professional technical work and logistics

\$45/hr

Includes identifying, sourcing, ordering, coordinating shipping and receipt of ordered parts, staging for work, etc. Depending on the size and complexity of the total building retrofit project, either a markup on the installed retrofit costs of 50% is used, or an estimate of hours required, at a rate of \$40/hr.

Maintenance activities

\$45/hr

Includes maintaining light fixtures, door and window weather stripping, changing lamps, replacing bulbs, etc.

D.2 Plumbing fixtures

The (4) toilets in this facility should be retrofitted with dual flush valves (see Appendix H). A dual flush toilet valve will typically pay back within 1-3 years, depending on usage.

All (12) of the shower heads should be replaced with low flow (1.5 gpm) models, even though several are already low flow; this is recommended for ease of maintenance and consistency in stocking inventory. The savings calculations are below and are included in Tables 1.1 and 4.1 as EEM #A1:

Water Savings for Shower Head replacement	
# of people/day	41.2
# days/year	355
# pre-swim showers (50%)	20.6
# post-swim showers (100%)	41.2
length of time pre-swim (min)	2
length of time post-swim (min)	12
no. of 1.5 gpm shower heads	4
no. of 4.0 gpm shower heads	8
average flow/showerhead	3.2
flow for new low flow showerheads	1.5
existing conditions - total gallons/yr	602,232
proposed conditions - total gallons/yr	285,268
savings (gallons)	316,964
savings (cost)	\$1,135
estimated cost (12 showerheads)	\$1,800
Payback (yrs)	1.6

D.3 Lighting and Lighting controls

Lighting technology in general, and LED technology in particular, is changing very rapidly in the commercial and residential sectors. This section is intended to provide general lighting and lighting controls information to the building owner.

Lighting controls include occupancy sensors, lighting management systems and daylight harvesting. Each is described below and sample products can be found in Appendix H.

Occupancy sensors

Occupancy sensors sense the presence of occupants, turn the lights on at a pre-determined level, and then turn the lights off after a programmed time period (typically from 2.5 to 30 minutes) of no occupancy. Line of sight, motion sensing **occupancy sensors** can be installed in existing single or duplex switch boxes, as well as on ceilings. **Dual technology sensors** are typically ceiling mounted in rooms, lavatories, mechanical rooms, corridors, vehicle bays and storage areas where obstacles may interfere with line-of-sight sensors. The second technology in these sensors activates lighting based on sound or changes in position, and work even when a person is fully obscured by an obstacle. **Zoned occupancy controls** are typically recommended for long corridors, large vehicle bays and large storage areas with multiple switches and lighting zones. Zoned controls are designed to activate and de-activate lighting by zone, by row, or even by fixture, based on the location of the occupant. **Step-Dim occupancy sensors** turn on a portion of room lights (usually 1/3 or 2/3) upon occupancy, and allow the occupant to manually turn on the rest of the lights. Step-dim occupancy sensors require that the lighting is wired to accommodate the step function. Occupancy sensors can reduce power consumption by 25-60%. Paybacks on occupancy sensors range from 1 to 5 years, depending on the light fixture consumption and occupancy of the room. Sample switch mounted, ceiling mounted, single technology and dual technology occupancy sensors follow. High bay, parking

garage and/or **parking lot LED lighting** is now available with **dimming, occupancy sensing** capability built into each fixture. When occupancy is sensed, the fixture activates at full brightness. After a programmed period of time of no occupancy the fixture dims to 25% or 50% of its full brightness.

When occupancy sensors are added to a room with linear florescent lighting, the recommended ballast is a programmed start ballast. An instant start or rapid start ballast will detrimentally affect lamp life when used with an occupancy sensor.

LED Tubes

As little as 24 months ago, a 21 watt, line voltage LED tube was the standard replacement for a 32 watt T8 or a 40 watt T12 lamp. Today high “Lumens per watt” LED tubes allow a 12 watt tube to replace a 32 watt T8 or a 40 watt T12 lamp and produce approximately the same amount of light. 12 months ago, all LED replacements required re-wiring the fixture to bypass the ballast and provide line voltage directly to the “tombstone” end caps.

Today, in addition to the 12w and 21w line voltage LED tubes, there are 14w LED tubes which will operate on instant start electronic ballasts with no fixture re-wiring required – although in a commercial environment, it is advisable to remove the ballast and re-wire the fixture rather than use the existing ballast. This is recommended because at some point the ballast will fail and the same amount of labor (as re-wiring the fixture in the first place) will be required to replace the ballast, and the cost of a new ballast will be incurred. It is advisable to have a qualified electrician confirm ballast compatibility and LED tube selection, and perform the fixture re-wiring.

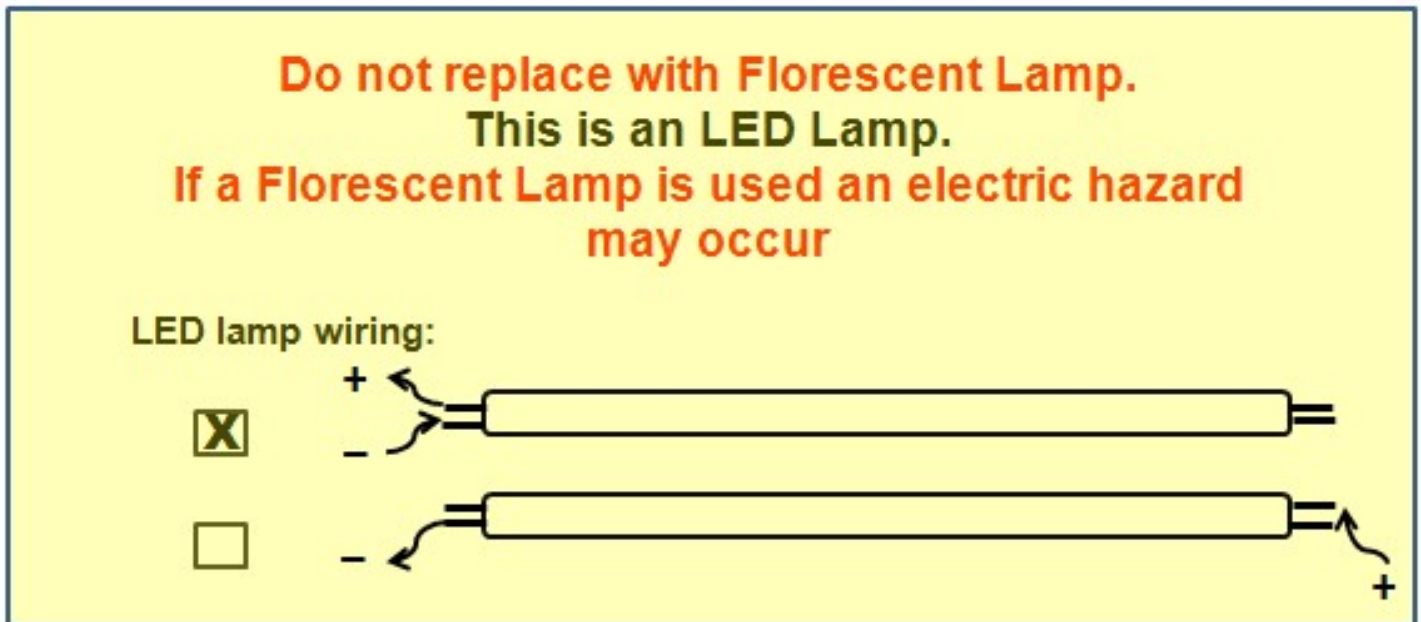
LED Screw-in bulbs

A-type, screw-in bulbs, typically using 9.5 watts, are now available at a cost of less than \$5.00 each. LED reflector bulbs, including BR30 (3.75” diameter) and BR36 (4.5” diameter) sizes, typically using 9.5 watts, are now available for less than \$12.00 each. All of these bulbs come in dimmable (more expensive) and non-dimming versions, and in a color spectrum which closely simulates incandescent light. See the Energy Star website at https://www.energystar.gov/index.cfm?c=lighting.pr_lighting_landing for additional information on lighting.



If a fluorescent lamp is installed in a fixture that has been re-wired for a line voltage LED lamp, it will short and may be a hazard. Therefore, after re-wiring a fixture, a warning label similar to the one that follows, should be put in an obvious location inside the fixture to prevent installation of the wrong kind of lamp.

**Sample Safety Sticker to install after re-wiring
florescent fixtures for LED lamps**



D.4 Additional Description of ECM's

No and low-cost EEM's are called Energy Conservation Measures (ECM's) and are usually implemented by the owner or by the existing operations and maintenance staff (they are also called O & M recommendations). ECM's can result in cost and consumption savings, but they also prevent consumption and cost increases, which are more accurately called "avoided costs" rather than cost savings. Listed below are a range of ECM's, some of which may be applicable to the subject building.

1. **Ongoing Energy Monitoring:** Extensive research by a number of organizations has validated the value of building system monitoring as an effective means to reduce and maintain lower energy consumption. A few of these organizations are the Lawrence Berkeley National Laboratories, the California Energy Commission and Texas A & M University.

HVAC "performance drift" is the deterioration of an HVAC system over time, resulting from a number of preventable issues. Performance drift typically results in a 5% to 15 % increase in energy consumption. Lawrence Berkeley National Laboratories identified these common contributors to performance drift:

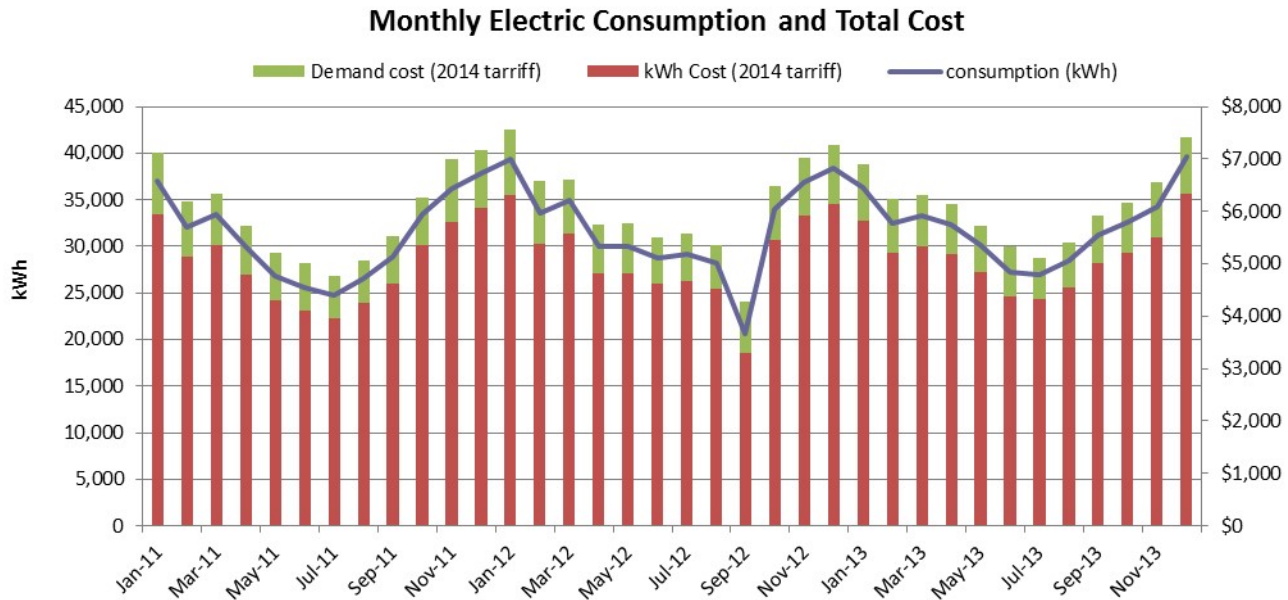
- Manually over-ridden automatic control settings including programmable thermostats, motor control switches, disabled variable frequency motor drives.
- Timer clocks not used or disabled
- Duct and/or valve leakage or dysfunction
- Pumps, fans or actuators not operating correctly
- Scheduling, resets and/or setbacks not matching building usage
- Degradation of sensors

A study of 60 commercial buildings by the same organization found that 40% had HVAC control problems, 15% had missing equipment and 25% had equipment that was not operating properly. The resulting inefficiencies created by problems like these may have been identified by this energy audit – although further investigation would be required to identify the specific causes. Any existing problems should be rectified per the EEM's recommended in this audit and a monitoring program should be implemented to prevent future performance drift.

It is recommended to implement a basic energy monitoring system for this building.

Monitoring Systems: There is a range of simple to very complex building monitoring systems commercially available, most utilize a user-friendly internet or network based dashboard. There are stand-alone systems as well as monitoring capability built into most DDC control systems. Some systems do not have the capability to monitor NG consumption. A small sampling of some commercially available stand-alone building monitoring systems includes:

Do it Yourself – A simple spreadsheet with an accompanying graph may be sufficient to alert a building owner that energy consumption has gone awry. All forms of energy consumed by the building (kWh, gallons of fuel, therms of gas, etc.) should be recorded on a monthly basis, and at least a rolling, 3 year historical trend should be carried. The figure below is an example.



Mach Energy – recurring “subscription model”; sensors are installed and proprietary software and internet based dashboards are used. Programs and software ranges from \$1995/building/year for entry level packages to \$5000+/building/year for comprehensive packages. <http://www.machenergy.com/>

Monnit – “product model”; sensors are purchased (cost from \$500-\$1500) and installed, basic network-based dashboard is free. A more comprehensive, higher level of functionality, internet-based dashboard for a building of this size is \$60-\$100/year. <http://www.monnit.com/>

ARIS - The Alaska Housing Finance Corporation offers free energy tracking software online. The Alaska Retrofit Information System can help facility owners track and manage energy use and costs. Once data is entered, through spreadsheet or online, several reports are available to rank energy use and energy cost indices, graph year over year use for individual buildings, and compare your buildings to other facilities with the same use, i.e., how does my library, or fire station compare in energy use to other communities libraries or fire stations. For more information contact Scott Waterman at swaterman@ahfc.us

BMON - AHFC has developed a building monitoring software to use with Monnit or other sensors. This software is free to any user, open source, can be modified to user needs, and can absorb and display data from multiple sources. It can manage multiple buildings, and can be installed by anyone with a little IT experience. This software is available at <https://code.ahfc.us/energy/bmon>.

2. **Create an organizational “energy champion” and provide training.** It can be an existing staff person who performs a monthly walk-through of the building using an Energy Checklist similar to the sample below. Savings from this activity can vary from zero to 10% of the building’s annual energy cost.

CHECKLIST - MONTHLY WALK-THROUGH OF EACH BUILDING	check
Thermostat set points and programming	
What are the inside and outside temperatures? Is it too hot or cold in the building?	
* Is a computer and display left on while the workstation is unoccupied?	
**Are unoccupied room lights on?	
Are personal heaters in use?	
Are doors or windows open with the heat on?	
Review monthly consumption data in monitoring system dashboard or spreadsheet	

* Consider adding an Isole plug load management device (Appendix C)

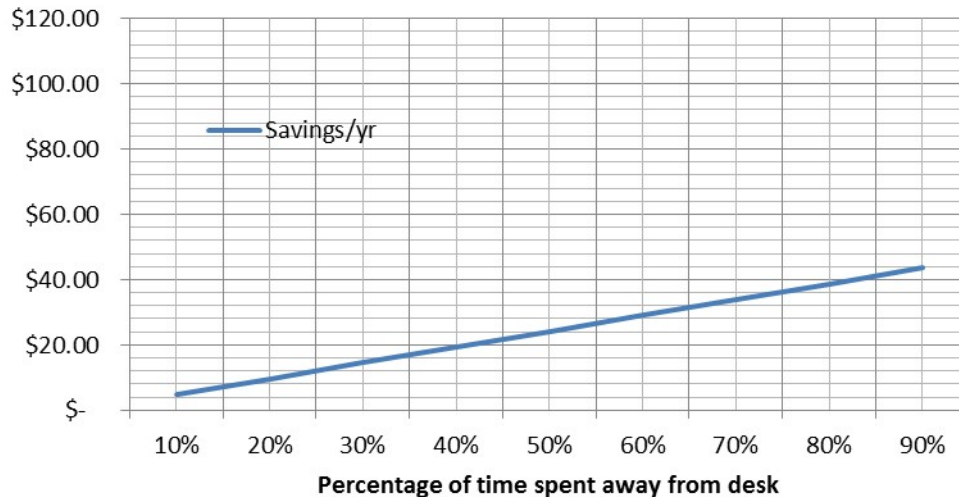
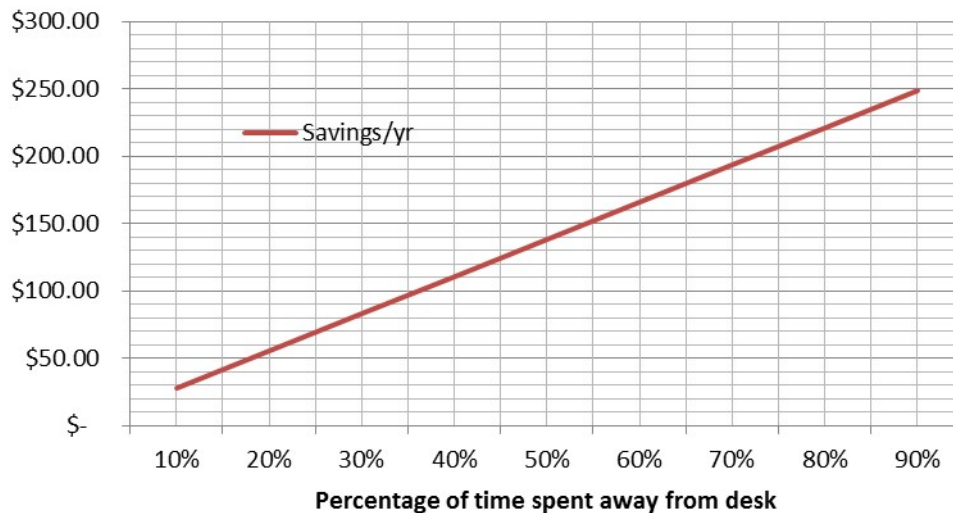
** Consider adding occupancy sensors (Appendix C)

- 3. Efficient Building Management:** Certain EEM's and ECM's are recommended to improve the efficiency of building management. As an example, all lights should be upgraded at the same time, all lamps should be replaced as a preventative maintenance activity (rather than as they fail, one at a time), lamp inventory for the entire building should be limited to a single version of an LED or fluorescent tube (if at all possible), and all appropriate rooms should have similar occupancy controls and setback thermostats.

Other examples of efficient building management include:

- If a building is only partially occupied and has adequate zoning, group occupants together in the same heating zone and turn down the heat and turn off lighting in the unoccupied zones.
- Conversion from an 8 hr. per day, 5-day work to a 10 hr. per day, 4-day work week, or conversion to a "work 1 day at home" and shutting down the office for 1 day per week will save energy
-

- 4. Air Infiltration:** All entry and roll up doors and windows should be properly maintained and adjusted to close and function properly. Additionally, weather stripping should be maintained if it exists or added if it does not. Heat loss around the lower portion of several doors is apparent in the IR images in Appendix F. Poorly maintained weather stripping or leaky doors or windows can add 1000 CFM of infiltration, which is calculated to add \$424/yr by AkWarm© to heating costs in this building.
- 5. Turn off plug loads** including computers, printers, faxes, etc. when leaving the office. For workstations where the occupant regularly leaves their desk, add an occupancy sensing plug load management device (PLMD) like The "Isole IDP 3050" power strip produced by Wattstopper. The graphs below demonstrate annual savings in Hoonah and Haines for various amounts of time spent away from the desk – it is not unusual to be away from the desk for 50% of the work day.

Single monitor, no personal htr**Two monitors, personal heater**

6. **HVAC Maintenance** should be performed annually to assure optimum performance and efficiency of the boilers, circulation pumps, exhaust fans and thermostats in this building. An unmaintained HVAC component like a boiler can reduce its operating efficiency by 3% or more.
7. **Replace key-switch controlling Laundry room lights:** Because a “key” is not handy, these lights are left on 24/7 for no reason – one of the fixtures in the lobby is a 24/7 night light. It is recommended to replace this switch with a normal manual light switch.
8. **Additional ECM recommendations:**
 - a. Maintain air sealing on the building by sealing all wall and ceiling penetrations including switch, electrical outlet and light fixture junction boxes and window and door caulking. Air sealing can reduce infiltration by 500-1000 cfm.
 - b. At their EOL, replace refrigeration equipment with Energy Star Versions.

Appendix E – Project Summary

ENERGY AUDIT REPORT – PROJECT SUMMARY	
General Project Information	
PROJECT INFORMATION	AUDITOR INFORMATION
Building: Bob Korn Memorial Pool	Auditor Company: Energy Audits of Alaska
Address: 609 Railroad Ave	Auditor Name: Jim Fowler, PE
City: Cordova	Auditor Address: 1231 W. Northern Lights Blvd
Client Name: Meghan Schinella	Suite #807
	Anchorage, AK 99503
Client Address: 609 Railroad Ave Cordova, AK 99574	Auditor Phone: (907) 269-4350
Client Phone: (907) 424-7200	Auditor FAX: () -
Client FAX:	Auditor Comment:
Design Data	
Building Area: 7,755 square feet	Design Space Heating Load: Design Loss at Space: 0 Btu/hour with Distribution Losses: 0 Btu/hour Plant Input Rating assuming 82.0% Plant Efficiency and 25% Safety Margin: 0 Btu/hour Note: Additional Capacity should be added for DHW and other plant loads, if served.
Typical Occupancy: 43 people	Design Indoor Temperature: 77.4 deg F (building average)
Actual City: Cordova	Design Outdoor Temperature: -2 deg F
Weather/Fuel City: Cordova	Heating Degree Days: 9,004 deg F-days
Utility Information	
Electric Utility: Cordova Electric Cooperative - Commercial - Sm	Natural Gas Provider: None
Average Annual Cost/kWh: \$0.144/kWh	Average Annual Cost/ccf: \$0.000/ccf

Annual Energy Cost Estimate									
Description	Space Heating	Space Cooling	Water Heating	Ventilation Fans	Lighting	Other Electrical	Swimming Pool	Service Fees	Total Cost*
Existing Building	\$3,668	\$0	\$11,174	\$8,121	\$5,919	\$3,430	\$47,430	\$0	\$79,743
With Proposed Retrofits	\$3,557	\$0	\$10,311	\$684	\$1,276	\$3,430	\$32,512	\$0	\$51,771
Savings	\$111	\$0	\$863	\$7,437	\$4,643	\$0	\$14,917	\$0	\$27,972

* These Total Cost and Savings figures do not include water/sewer costs or water savings by EEM #A1

Appendix F – Photographs and IR Images



AHU-1 inlet in center, exhaust vent at left; exhaust has been unused since the fan was de-commissioned



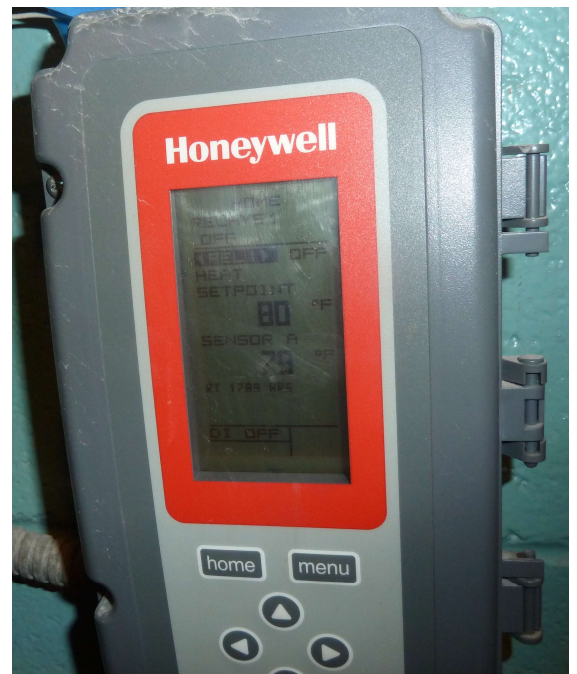
Hot water generators in background, boiler in foreground



Boiler appears to be in good condition



Filter pit and water temperature controller

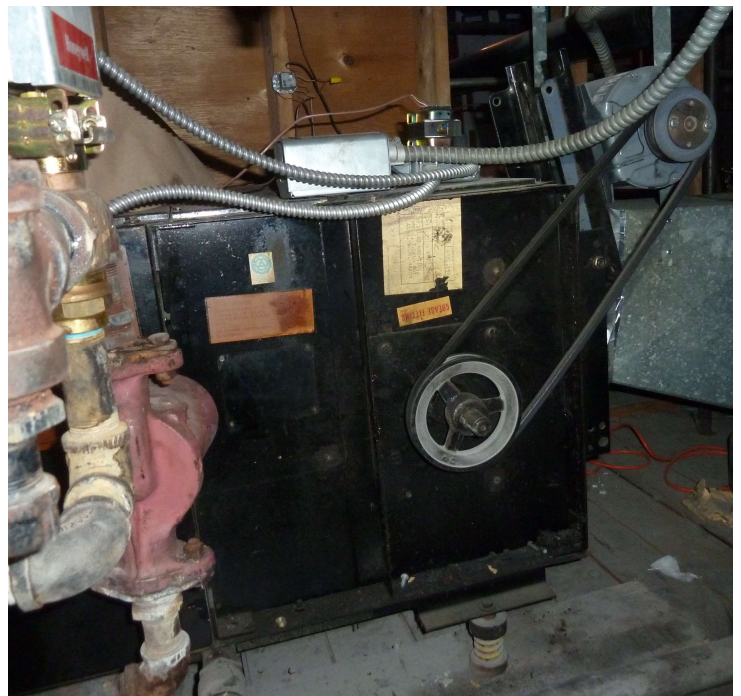




Salt system for water sanitization



AHU-2





Control panel for AHU-2 above; time clock for AHU-2 (right) is not in use



AHU-2 heating coil should be cleaned inside and out



AHU-1 primary heating coil



Pre-heat and main heating set points have been altered



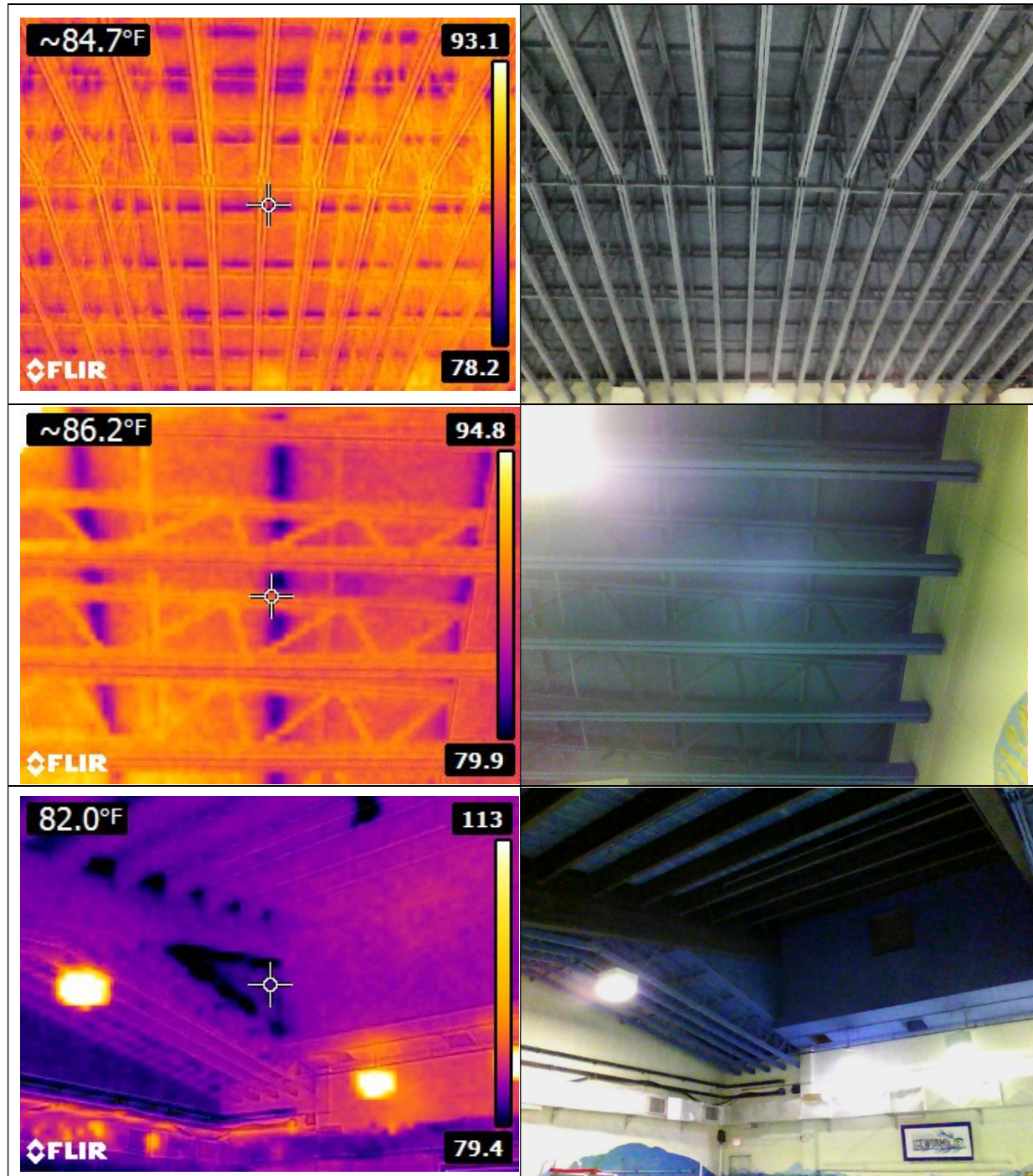
Clearstory exhaust fans; #3 is manually turned off, #2 and #1 seem to run continually



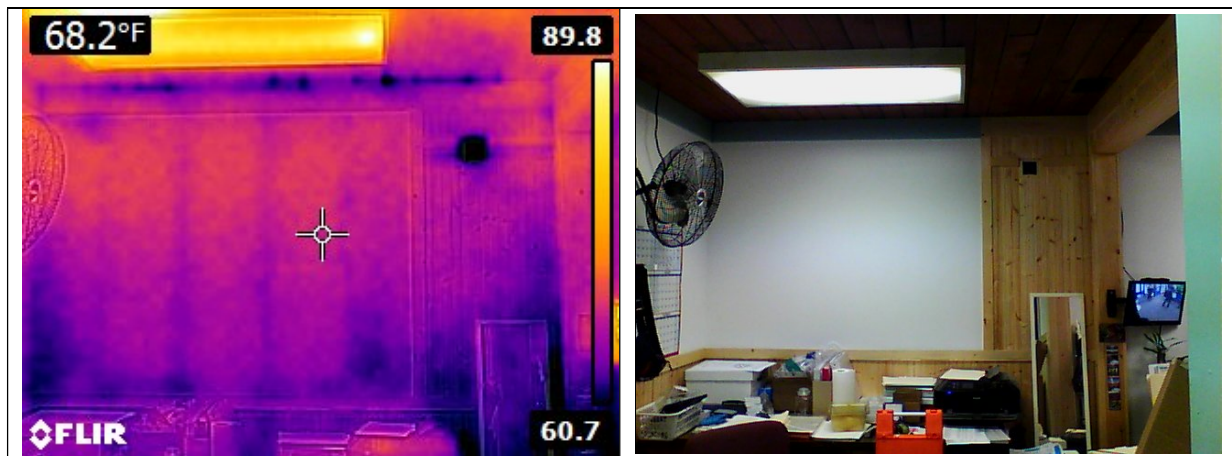
Typical manual thermostatic control valve on fin-tube baseboard heaters



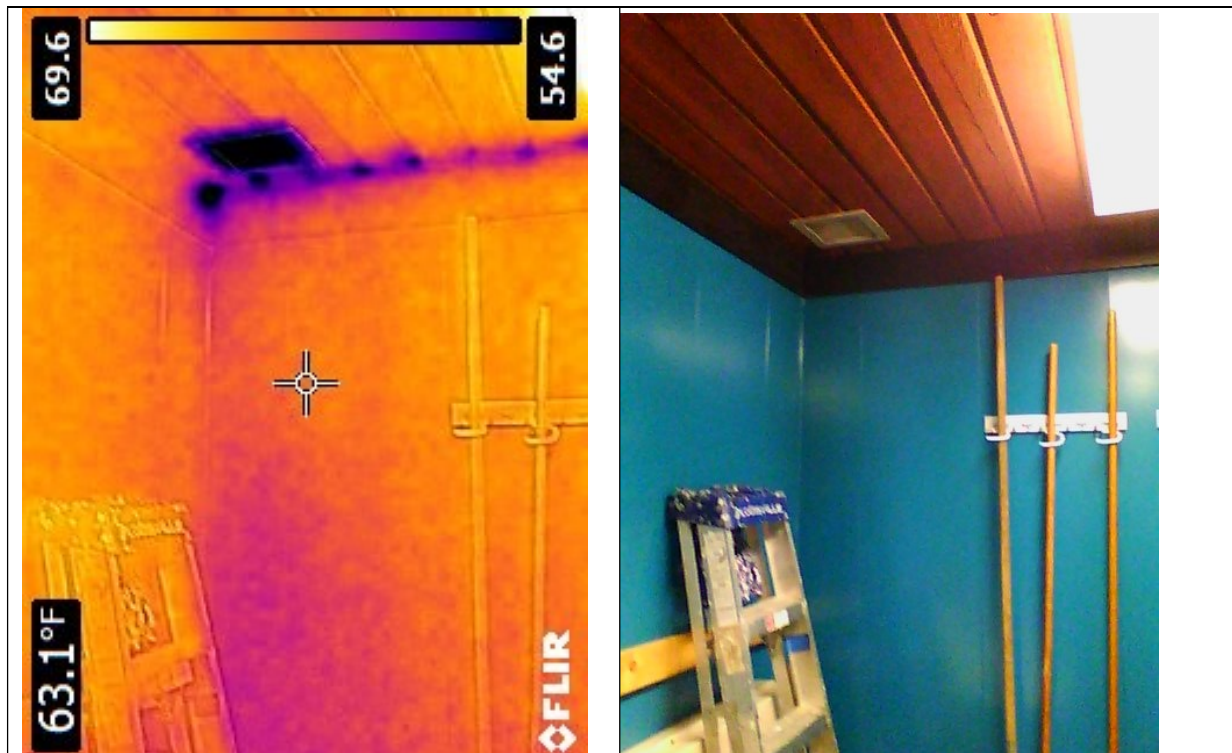
Unit heater typical of Men's and Women's locker rooms. Note wall switch is turned off due to occupancy complaints of noise and air blowing on wet bathers



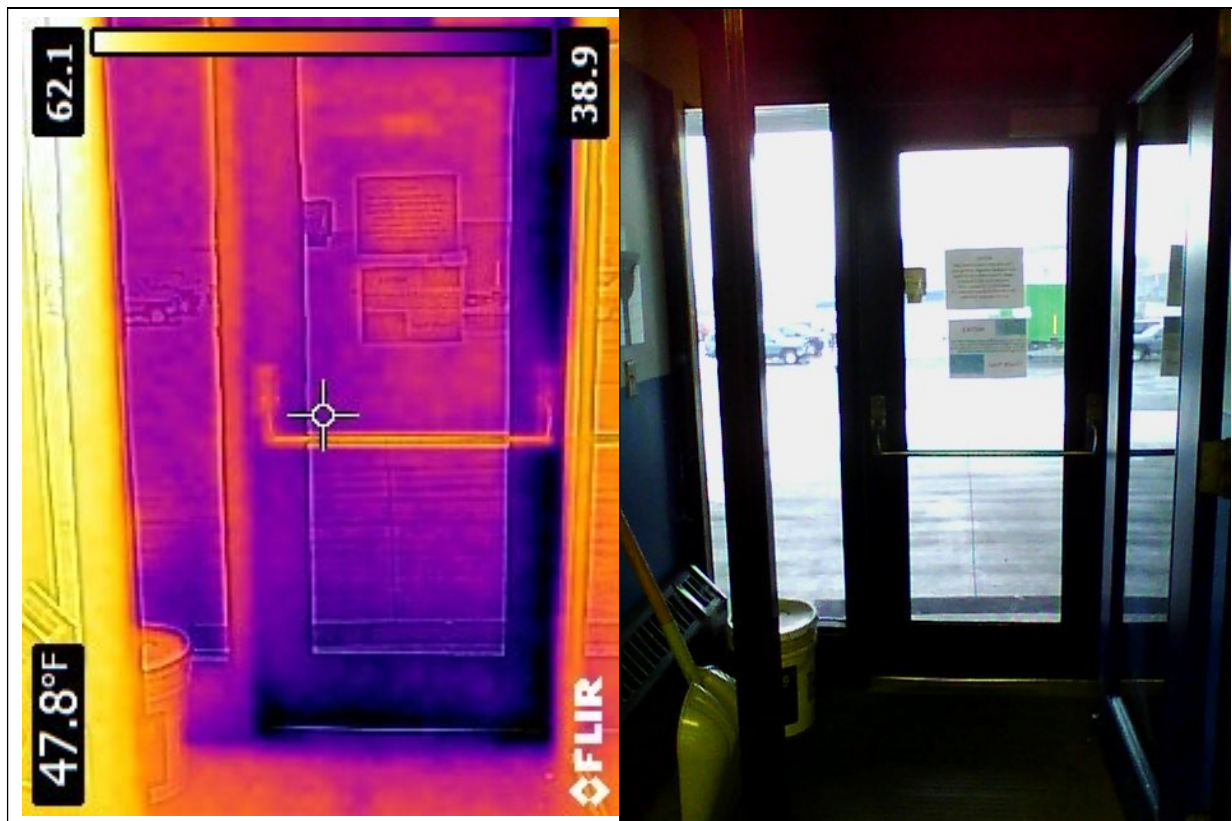
1. Rigid roof insulation has many poorly sealed joints and sections, resulting in a reduction of the overall insulation value



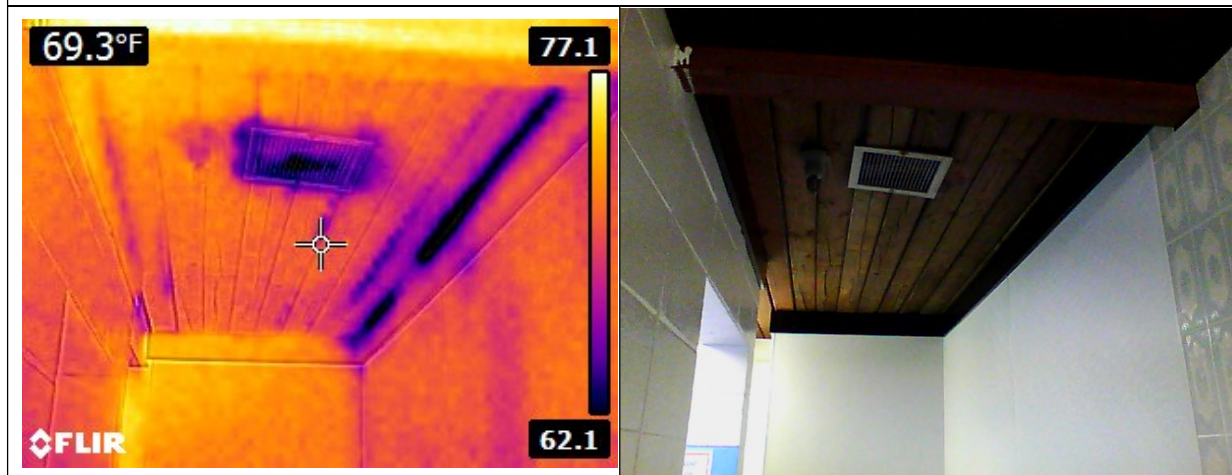
2. Heat loss wicking through studs is fairly normal. Infiltration through electrical outlets and switch covers should be eliminated by sealing all penetrations



1. Additional infiltration through de-commissioned exhaust ducting should be sealed. Poor insulation in corners is normal and difficult to rectify



2. Entry doors would benefit from new weather stripping and sweep

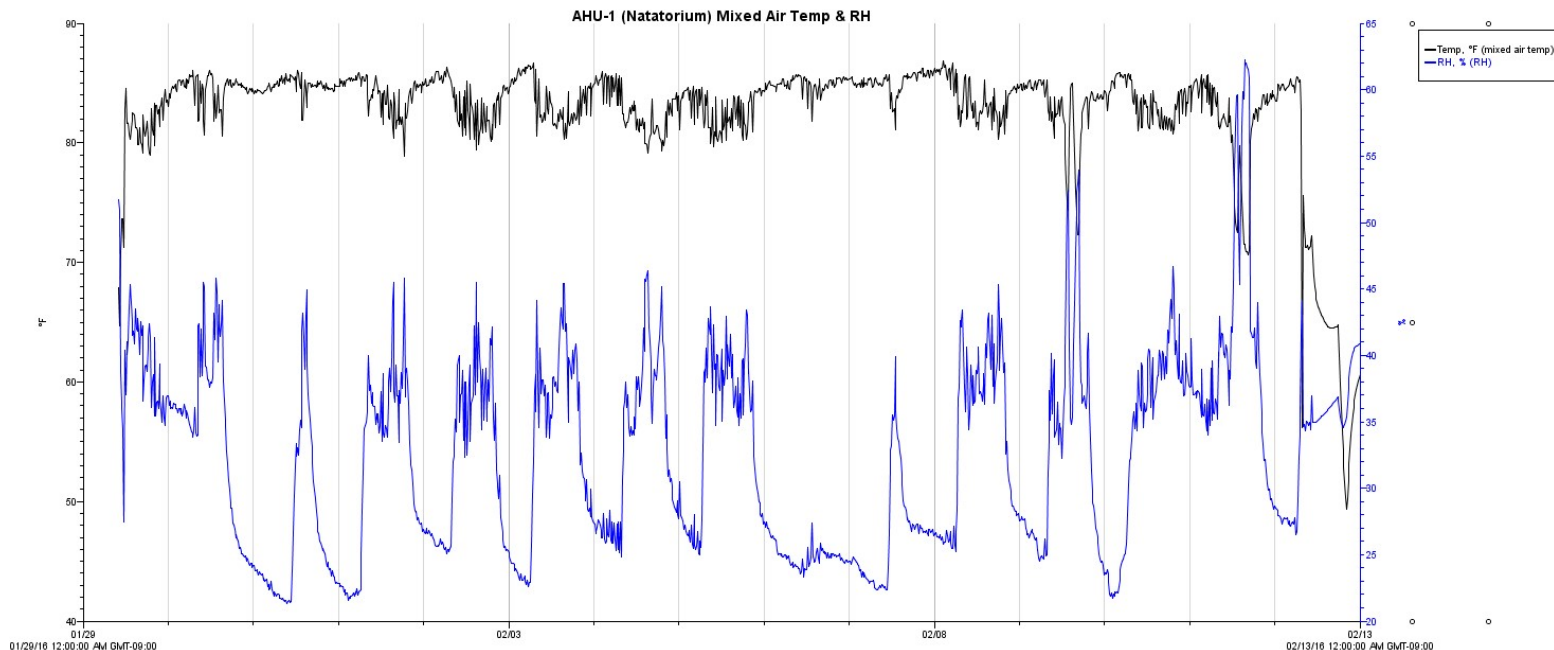


3. More infiltration through de-commissioned exhaust ducting; should be sealed

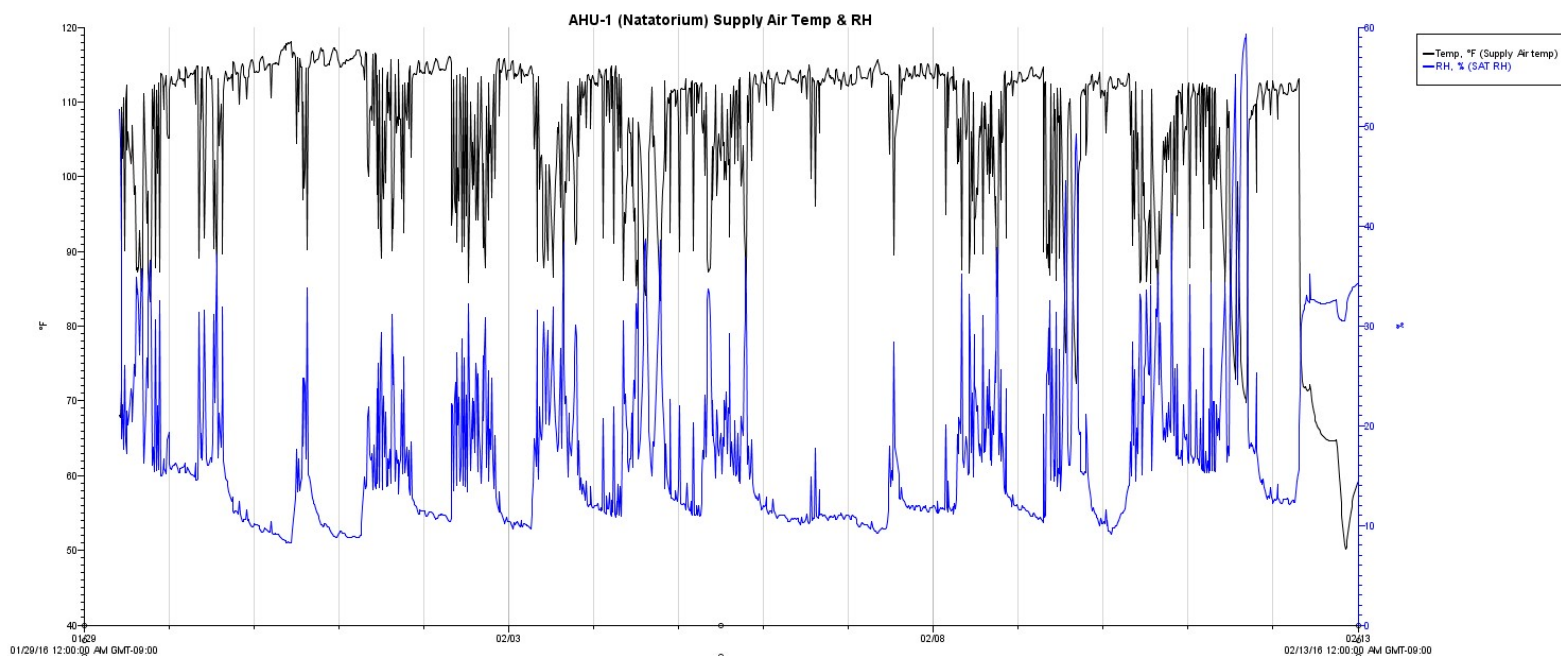
Appendix G – Data Logging Graphs

(Logging period was 1/29/16 through 2/11/16)

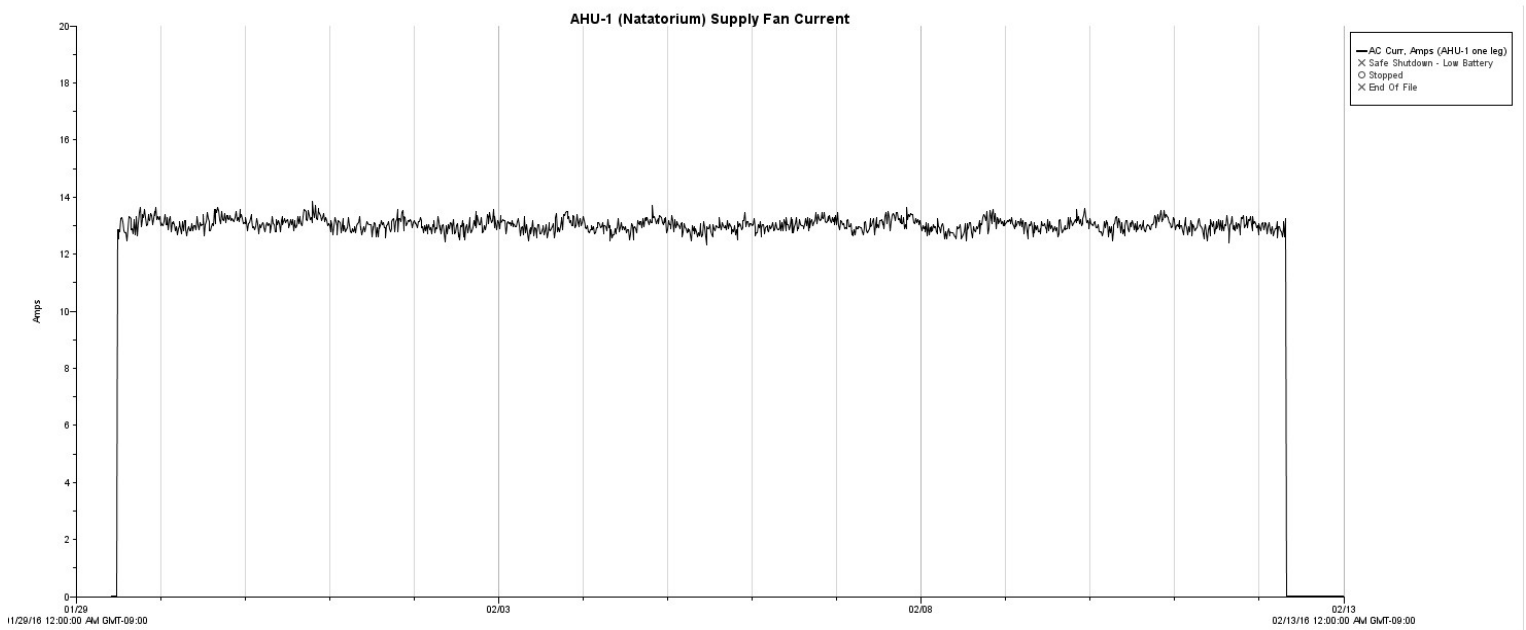
AHU-1 mixed air temp and RH



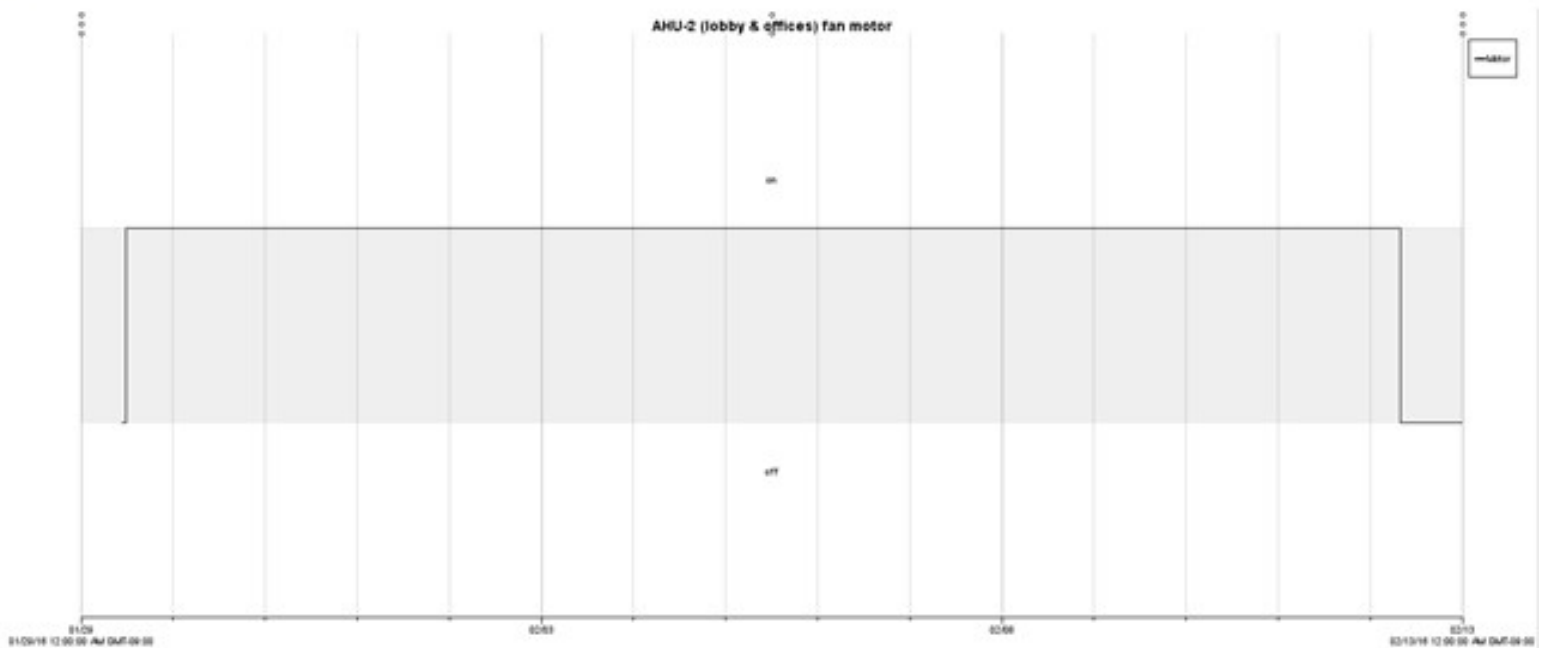
AHU-1 supply air temp and RH



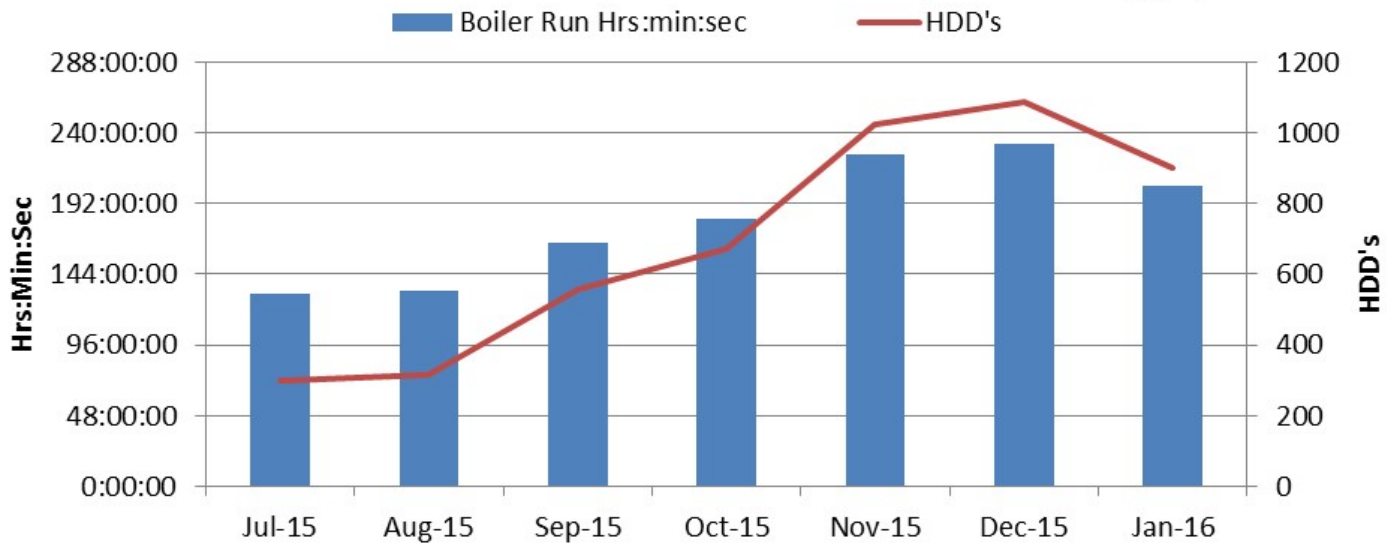
AHU-1 Current (indicates that the unit ran continually during the period)



AHU-2 motor on/off (indicates that motor was "on" continually during the period)

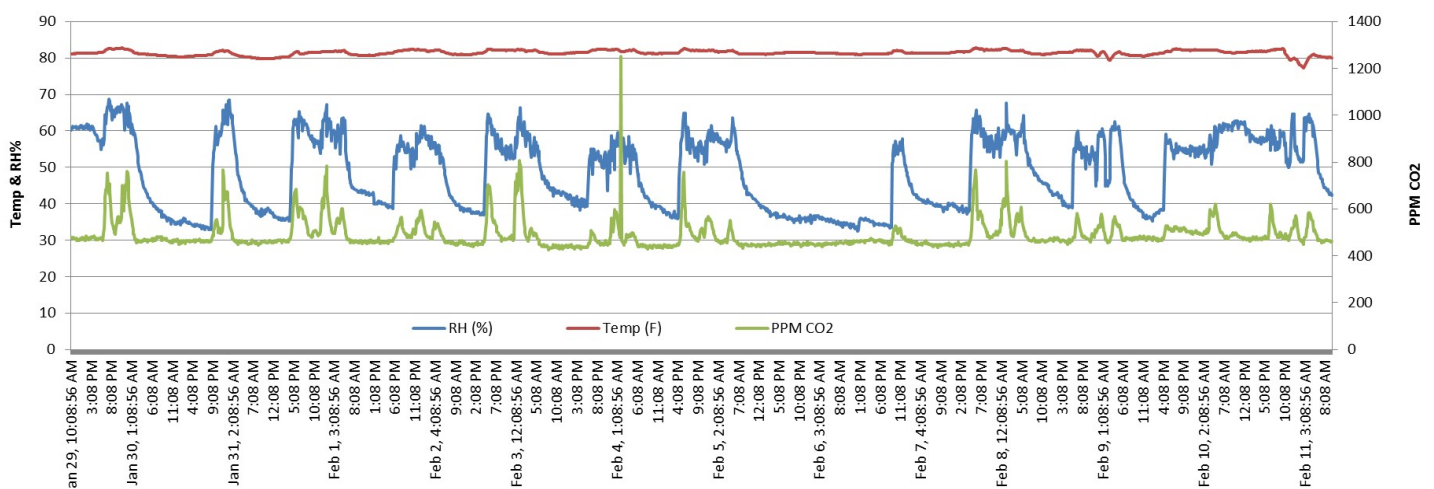


Cordova Pool Boiler burner motor run time (ACEP data logger)

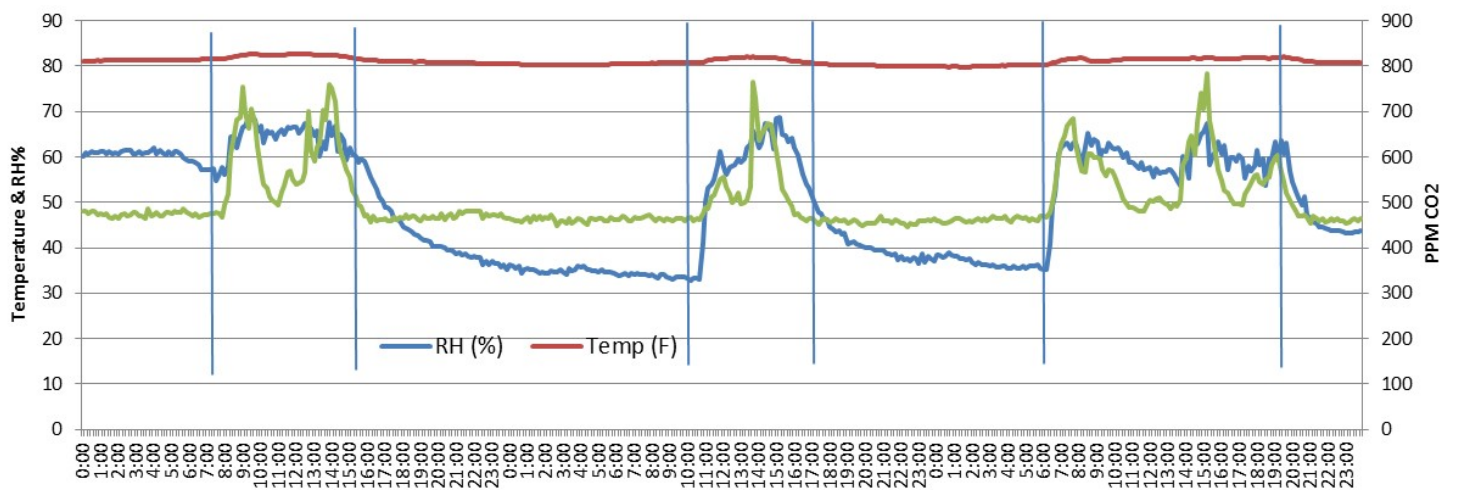


Outdoor CO2 level measured at 440 PPM. The time clock in the data logger was incorrect, it is corrected in bottom graph.

Natatorium RH, Temp & CO2 - 14 day period



Natatorium - time corrected - RH, Temp & CO2 - 3 day period



Appendix H – Manufacturer's Specifications & Cut Sheets

(These are samples only to provide building owner with an idea of recommended product types, electricians and/or mechanical contractors may recommend various other equipment.)

Retrofit dual flush valve for flushometer type toilet

The Fastest Way to Start Saving Water!

Dual-Flush Flushometer

Sloan's UPPERCUT® Dual-Flush Flushometer introduced dual-flush operation to the commercial marketplace — and facilities have been saving more water ever since. In fact, the UPPERCUT has been proven to reduce water usage by 30%. The UPPERCUT is one of only two Flushometers in the world to receive Cradle to Cradle™ design certification for its eco-effectiveness; the other is Sloan's Royal® model 111 Flushometer.



UPPERCUT®

UP for liquid waste

DOWN for solid waste

Patented*

SLOAN.
The Water Efficiency Company

*Dual-Flush Flushometers are available for commercial Flushometer style bowls**.*

- Lifting handle up initiates reduced flush (1.1 gpf), evacuating liquid and paper waste, saving a 1/2-gallon of water!
- Pushing handle down initiates full flush (1.6 gpf).
- Antimicrobial coating on distinctive green handle.
- Available as a retrofit kit for Sloan and other installed Flushometers.
- UPPERCUT Flushometers are among the many Sloan products that comply with the **Buy American Act**.
- Easy-to-understand instructions, etched on adhesive backed metal plates included with every Flushometer.

For more information, please visit www.sloanvalve.com or call 866-663-2289.

*Manufactured in the U.S.A. under U.S. Patent 7,607,635 with other patents pending.
**Can be used on all High-Efficiency commercial Flushometer bowls and any high-performance 1.6 gpf fixtures.

Low Flow Aerator – 1.5 gpm



PCA® Care Laminar Stream

FEATURES

- Provides a splash free crystal clear (non aerated) stream.
- Unique screenless 100% plastic Cascade® construction prevents lime build up.
- Color-coded to identify flow rate.
- Recommended for use in medical facilities to prevent airborne bacteria from entering the water stream.
- Pressure compensating for constant flow from 20 to 80 psi.
- Virtually unbreakable single piece insert ensures a longer useable life.
- Available housing finishes: unplated, chrome and PVD.
- Laser marked housings: statutory mark and custom logo.
- Rubber washer.

CERTIFICATION

ANSI/NSF 61

ASME A112.18.1M

CSA B125

Complies with VHA Directive 2002-073

PART NUMBERS* & PACKING

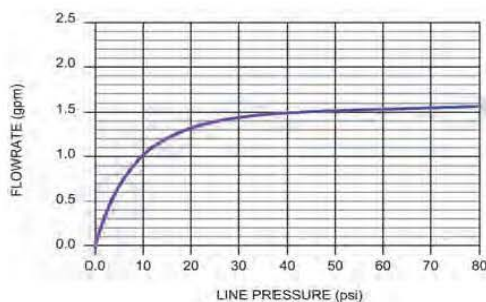
Designation	Part #	Packing
Insert only	A5.4162.0	3000
Regular male 15/16"-27	B1.7723.1	500
Regular female 55/64"-27	B1.7713.1	500
Reg. dual thread 15/16"-27 55/64"-27	B1.7773.1	500
Vandal proof male 15/16"-27	B9.7723.1	400
Vandal proof female 55/64"-27	B9.7713.1	400
Vandal proof dual thread	B9.77F3.1	400
Vandal key	BX.399C.1	

*Other combinations also available

COLOR CODE

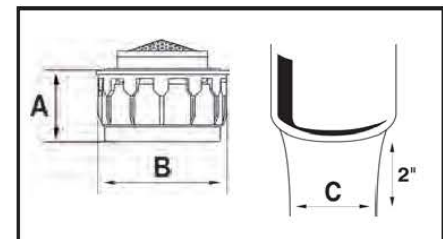
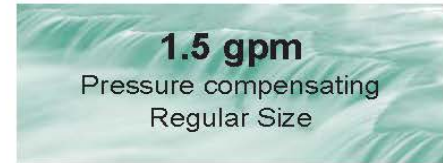
Dome: Orange Diffuser: Gray

FLOW RATE CURVE



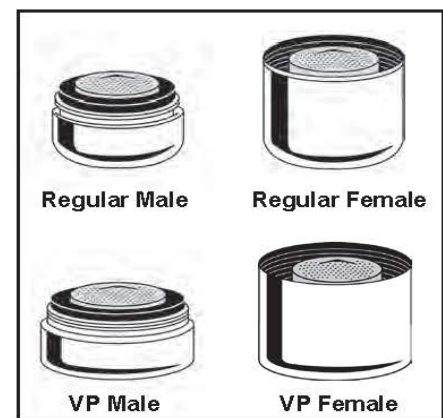
NEOPERL Inc., Waterbury, CT • Tel: (203) 756-8891 • Fax: (203) 755-5717 • www.neoperl.com

04/03 - Information subject to change without notice



DIMENSIONS

No	mm	In
A	12.00	.472
B	20.05	.789
C	≈ 13	≈ 1/2



TECHNICAL DATA

Materials: Body Acetal
O-ring EPDM
Washer EPDM
Working temperature: 150°F
Working pressure: 125 psi

Digital timer

For plug-in heaters, large copy/printers, TV's and anything with a "sleep" cycle – schedule to turn devices completely off during unoccupied hours

APC by Schneider Electric

United States [change]

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Product information Search

Solutions Products and Services Support Your Business Company

You are here: Home > Products > Surge Protection and Power Conditioning > Surge Protection Devices > SurgeArrest Essential

SurgeArrest Essential

APC Power-Saving Timer Essential SurgeArrest, 4 Outlet Wall Tap, 120V

Basic Protection Against Power Surges for Computers and Electronics

Includes: User Manual

Standard Lead Time: Usually in Stock

★★★★★
Be the first to [write a review](#)

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P4GC
Price *: \$18.99
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[RoHS](#) [Green Premium Product](#)

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Technical Specifications Product Overview Documentation Ratings and Reviews

Output	
Number of Outlets	4
Receptacle Style	NEMA 5-15R
Input	
Nominal Input Voltage	120V
Input Frequency	50/60 Hz
Input Connections	NEMA 5-15P 
Maximum Input Current	15A
Surge Protection and Filtering	
Surge energy rating	1080 Joules
EMI/RFI Noise rejection (100 kHz to 10 MHz)	40 dB
Peak Current Common Mode	72 kAmps
NM Surge Response Time (ns)	1 ns
Let Through Voltage Rating	< 400

Occupancy Sensing Plug Load Management Device

Realize energy savings by turning plug loads off

Why keep plug loads operating when no one is there to use them? Isolé ends the energy waste by turning plug loads on and off based on occupancy.

The **Isolé IDP-3050** consists of an eight-outlet power strip with surge protection and a personal occupancy sensor that utilizes the latest passive infrared (PIR) technology. When the sensor detects occupancy, it turns on controlled outlets. When the space becomes vacant, the sensor turns off these outlets automatically after the preset time delay expires.

Plug loads account for an increasing percentage of the total energy consumed by buildings—up to 15 to 20% in homes and commercial buildings. According to the EPA, “energy consumption by office equipment represents the fastest growing use of electricity in the country.”

How much energy can users save?

A single workspace can consume 1,500 kWh each year with an average cost of \$175 (and growing)! Add up the cost of every workspace and the amount is staggering. Isolé can dramatically cut this cost with energy savings of up to 50%.



Essential machines (hard drives, faxes) use uncontrolled outlets to remain operating continuously.



Equipment that isn't needed when the workspace is unoccupied (e.g., monitors, task lighting, printers) plug into controlled outlets that respond to the occupancy signals.

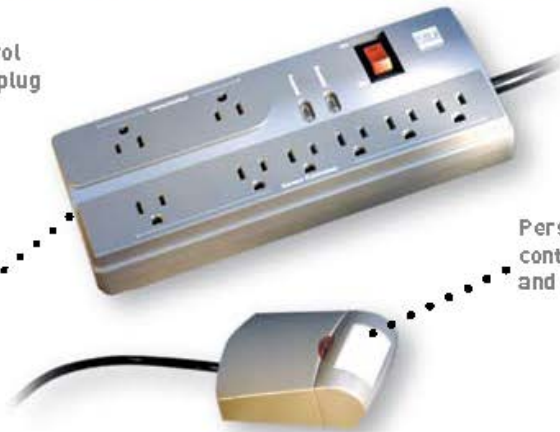




Isolé IDP-3050 Power Strip with Personal Sensor

Energy-saving control system for desktop plug load equipment

Eight-outlet power strip with surge protection



Six outlets are controlled by occupancy; two outlets are uncontrolled

Personal sensor signals controlled equipment on and off based on occupancy

Product Overview

Description

The Isolé IDP-3050 is an energy-saving control system that provides maximum surge and noise suppression while keeping plug load equipment off when there is no occupancy. It consists of an eight-outlet power strip and a personal occupancy sensor.

Operation

The IDP-3050 turns plug load devices on and off based on occupancy. The personal sensor connects to the eight-outlet power strip with the attached cable. The power strip contains six outlets controlled by occupancy and two outlets that are uncontrolled. The IDP-3050 automatically turns all controlled devices on when the workspace is occupied, and off when the workspace has been unoccupied for the user-defined time delay. Uncontrolled devices remain on regardless of occupancy.

Surge Suppression

The power strip provides a high degree of surge suppression that protects connected equipment against threats like power surges, lightning strikes and voltage spikes. It features a resettable circuit breaker and two LEDs that indicate that the outlet is wired and grounded properly and the surge protection is functioning.

Application

The IDP-3050 is ideal for controlling task lighting and computer monitors. Additional devices for the controlled outlets include space heaters, fans and other equipment that can be turned off during unoccupied periods. Devices such as CPUs and fax machines should be plugged into the uncontrolled outlets. Applications include workstations, open office cubicles, offices and engineering stations.

Features

Power Strip

- Eight outlets; six controlled, two uncontrolled
- Surge and noise suppression protects desktop equipment
- Ground protected for safety; will not operate without a grounded outlet
- Two LEDs to indicate: 1) correct wiring and grounding; 2) surge protection is functioning
- Installation requires no hardwiring
- Flat offset plug for wire management
- One uncontrolled outlet and one controlled outlet are wall-transformer-enabled
- Plugs into a standard three-prong outlet

Personal Sensor

- Uses latest passive infrared (PIR) technology to detect occupancy
- User-adjustable time delay of 30 seconds to 30 minutes
- Multi-level Fresnel lens for superior occupancy detection
- 120° coverage, up to 300 square feet
- ASIC technology reduces components and enhances reliability
- Instantaneous response time

WattStopper
www.wattstopper.com
800.879.8585

PROJECT _____

LOCATION/TYPE _____

Specifications

Power Strip:

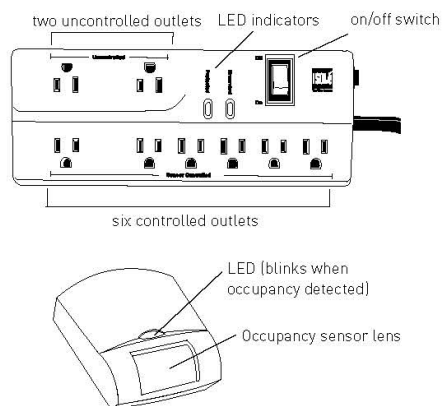
- Electrical rating: 120VAC, 12A, 50/60 Hz
- 12A dry contact relay
- Six-foot black cord
- Transformer provides power to sensor
- Mounts with screws or double-sided tape
- UL 1449 rating: 600V
- Circuit: High-energy, multistage hybrid
- Noise filtration: 0-25db (94.38%)
- Joule rating: 740 joules
- Maximum surge amperage: 48,000 Amps
- Protection modes: 500V L-N, 600V L-G, 600V N-G
- Response time: instantaneous
- Let-through voltage: 140V
- Initial clamping voltage: 200V
- UL and CUL listed; five-year warranty

Personal Sensor:

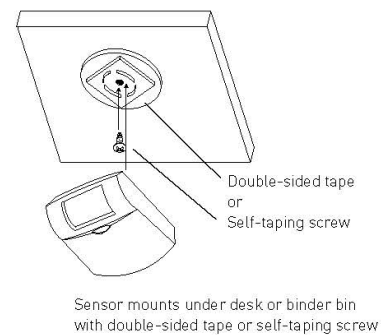
- Nine-foot connector cable
- Supply voltage: 12 VDC
- UL and CUL listed; five-year warranty

Controls & Mounting

Product Controls

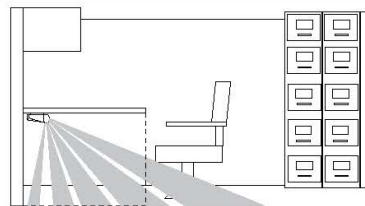


Personal Sensor Mounting

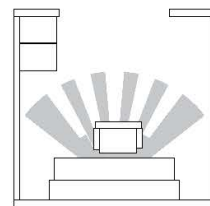


Coverage

Side Coverage



Overhead Coverage



Ordering Information

Catalog No.	Description
☐ IDP-3050-A	Eight-outlet power strip with personal sensor
☐ DI-110	Auto-on personal sensor
☐ CK1-1	20' extension cable w/single 1-1 connector (for single sensor and power strip)
☐ CK1-2	Two 10' extension cables w/duplex 1-2 connector (for multiple sensors and/or power strips)

Products are dark grey

Pub. No. 11907 rev. 9/2009

www.wattstopper.com
800.879.8585



Programmable, 7-day set-back, low voltage thermostat (with Wi-Fi capability)



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Honeywell 7-Day Programmable Thermostat Built-In Wifi

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Your Store: **Wasilla, AK**

Store Info | Change Store



Honeywell 7-Day Programmable Thermostat Built-In Wifi

Item #: 171234 | Model #: RTH6580WF1001

★★★★☆ 116 reviews | Write a review

\$130.90

In-use images; accessories not included

Additional Images | Demo

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FREE Store Pickup

Your order can be available for pickup in Lowe's Of Wasilla, AK today.

Change Store

Lowe's Truck Delivery

Your order will be ready for delivery to you from your selected store.

Parcel Shipping

Sent by carriers like UPS, FedEx, USPS, etc.

Honeywell 7-Day Programmable Thermostat Built-In Wifi **\$130.90**

Subtotal: \$130.90

Qty: 1

Add to Cart

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Related Items

Honeywell 7-Day Touch Screen Programmable... **\$163.90**

Honeywell 7-Day Touch Screen Programmable... **\$252.00**

Description | Specifications | Reviews | Community Q&A

Heating Only	Yes	Daylight Savings Time Ready	Yes
Cooling Only	Yes	Optional Battery-Free Operation	No
Compatible with Warm Air Furnace	Yes	Shape	Rectangle
Compatible with Central Air Conditioning	Yes	Height (Inches)	3.75
Compatible with Hot Water	Yes	Width (Inches)	5.75
Compatible with Steam or Gravity	Yes	Depth (Inches)	1.25
Use with Floor/Wall Furnace 24V or 750mV	No	UL Safety Listing	No
Use with Volt Gas Fireplace 24V or 750mV	No	CSA Safety Listing	No
Use with Pellet Stove for mV Thermostats	No	Single-Stage Heating	Yes
Use with Electric Baseboard 120V-240V	No	Single-Stage Cooling	Yes
Program Type	7-day	Multi-Stage Heating	Yes
Program Periods per Day	4.0	Multi-Stage Cooling	Yes
Auto System Change from Heat to Cool	Yes	Compatible with Heat Pump (No Aux.)	Yes
Touch Screen Programming	No	Compatible with Heat Pump (No EM)	Yes
Backlit Display	Yes	Compatible with Heat Pump (With Aux.)	Yes
Temperature Displayed	Current and setpoint/desired temperature	Compatible with Heat Pump (With EM)	Yes
High/Low Desired Temperature Limits	No	Iris Technology	No
Temporary Vacation Override	No	Remote Control Included	No
Hold Temperature Button	Yes	Built-In WiFi	Yes
Early-Start Comfort Function	Yes	Voice Activated	No
Filter Monitor	Yes		

12 watt LED T8 Tubes – fixture must be re-wired to remove ballast and provide line voltage to end caps



LED COB T8 4ft Tube, 12watt and 18watt



Features

- Super Lumen Output
- LED Chip COB LED
- Beam Angle 140°
- 50,000 Hrs Life
- 5 Year Warranty
- Frosted. No Visible LED's
- CRI >80
- 130 Lumens per Watt
- UL Rated
- DLC Listed* 18 watt only

130 lm/W
IES LM-79-08



Part #	Input Voltage	Lumens	Operating Temp.	CRI	Average Life
T8LDCOB12W	110V or 277V	1560	-20°C to 45°C	83	>50,000 Hrs
T8LDCOB18W	110V or 277V	2260	-20°C to 45°C	83	>50,000 Hrs



1751 Panorama Point Suite D, Lafayette, CO 80026 Ph: 303.225.7595 Fax: 303.225.5410 sales@bravo-lighting.com bravo-lighting.com

14 watt LED T8 Tubes – direct replacement for T8 Fluor with instant start ballast (re-uses existing ballast)

Easily
upgrade
to LED
from fluorescent.



PHILIPS INSTANTFIT LED T8 LAMPS



Philips InstantFit LED T8 Lamps are an ideal energy saving choice for existing linear fluorescent fixtures.

Perfect for a wide range of applications

- Full light output in spaces with temperatures down to -22°F (-30°C)
- Perfect for applications with frequent "on/off" switching cycles
- Buildings that desire to be mercury free

Easy to experience

- Instant on, no flicker or buzz
- Fits into existing linear fixtures
- Compatible with Instant Start ballasts¹ eliminating the need for rewiring and allows fixture to maintain original UL and CSA compliance

Energy savings

- Over 41% energy savings vs F32T8 electronic instant start systems²

Sustainable lighting solution

- No mercury allowing for non-hazardous waste disposal
- Emits virtually no UV rays or IR
- Glass-free for use in food areas and refrigerated food displays
- 4 year limited warranty³

(1, 2, 3, See back page for footnotes)



PHILIPS

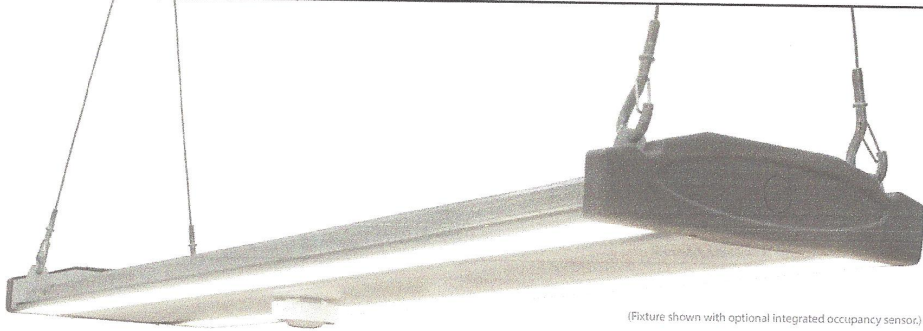
119w LED high bay fixture, with integral occupancy sensor – replacement for 400w HPS or MH



ESSENTIALS™ BAY SERIES v 2.0

2 LED MODULES (2M) FIXTURE OVERVIEW

TYPE



(Fixture shown with optional integrated occupancy sensor.)

ABOUT THE LUSIO ESSENTIALS BAY SERIES

The Lusio Essentials Bay Series is a family of high efficacy LED fixtures engineered to maximize performance and value. Essentials version 2.0 is introduced with the latest LED technology sorted to provide the same industry leading efficacy at 4000K or 5000K color temperatures. Separated finned aluminum heat sinks are designed to promote heat transfer from the LEDs by allowing air to pass. This keeps the LEDs cool so their useful life is extended. Ideally suited for one-for-one replacement of traditional fluorescent and HID light sources or new construction projects, the Lusio Essentials Bay Series can significantly reduce lighting costs and provide a very attractive return on investment. The Lusio Essentials Bay Series is backed by a 5-year warranty.

ESSENTIALS 2M FIXTURE DESCRIPTION

With a nominal 10-inch x 4-foot modular form, the Lusio Essentials Bay Series 2M fixture is equivalent in light output to 4-lamp T5HO fluorescent or 250W metal halide light fixtures and reduces power consumption by 53-62% to meet strict energy codes.

FIXTURE PERFORMANCE

	WATTAGE ¹	LUMENS ¹	EFFICACY ²	CRP ³
NL-BAFN: NO LENS, NO BAFFLE				
4000K/5000K ³	110	12,300	111.8	75
NL-BAFY: NO LENS WITH BAFFLE				
4000K/5000K ³	110	11,800	107.3	75
CA-BAFN: CLEAR ACRYLIC LENS, NO BAFFLE				
4000K/5000K ³	110	11,800	107.3	75
CA-BAFY: CLEAR ACRYLIC LENS WITH BAFFLE				
4000K/5000K ³	110	11,700	106.4	75
FP-BAFN: FROSTED POLYCARBONATE LENS, NO BAFFLE				
4000K/5000K ³	110	11,000	100.0	75

¹Typical at 120V and 25°C (77°F). ²Typical CRI. ³Consult factory for other CCT offerings. Lead times may be longer.

DIMENSIONS

INS (CMS) • LBS (KGS)

LENGTH ¹	WIDTH ¹	DEPTH ¹	WEIGHT	WEIGHT WITH BATTERY BACKUP
43-5/8 (110.8)	9-3/4 (24.8)	2-1/4 (5.7)	12 (5.4)	16 (7.2)

¹Dimensions listed are for the fixture only. See dimensional drawings for measurements with mounting hardware.

POWER FACTOR

120V	0.997
277V	0.952
347V	0.988
480V	0.969

TOTAL HARMONIC DISTORTION

120V	6.5%
277V	11.9%
347V	10.3%
480V	10.8%

FEATURES

POWER AND CONTROL

- **POWER INPUT:** 100-277V or 347-480V (50/60 Hz)
- **DIMMING:** Optional factory installed dimmable power supply (10-100% dimming) interfaces with standard third party 0-10V dimmers.
- **SENSORS:** Optional on-board, factory installed occupancy sensors available. See Lusio Accessories sheet for more information.
- **EMERGENCY BATTERY BACK-UP:** For 120-277V fixtures only, optional on-board, factory installed battery back-ups are available that produce 1,900-2,100 lumens for a minimum of 90 minutes.

LUMEN MAINTENANCE

- **L70 LIFE:** 90% lumen maintenance at 70,000 hours (77°F/25°C ambient); L70 predicted life is more than 200,000 hours

LISTINGS AND CERTIFICATIONS

- UL | CUL listed for safety (1598)
- UL | CUL dry/damp location listed
- RoHS compliant
- FCC Class B
- Lighting Facts (U.S. Department of Energy) certified
- DesignLights™ Consortium approved



FIXTURE

- **ENVIRONMENT:** Dry/damp locations. For interior applications.
- **HEAT SINKS:** Extruded aluminum heat sinks provide optimal thermal management, decreasing LED junction temperature and ensuring long life.
- **POWER SUPPLY ACCESS:** Center channel cover is hinged for easy access to power supplies and quick wiring.
- **OPTICS:** Two highly reflective white coated optics are available to enhance light output and reduce glare.
- **LENSES:** Recommended UV stable clear acrylic or frosted polycarbonate. Also available without a lens. Consult acrylic/polycarbonate chemical resistance chart for guidance in selecting the appropriate lensing material for your application.
- **WIRE GUARDS:** Optional wire guards can be field installed. See Lusio Accessories sheet for more information.
- **WARRANTY:** Limited 5-year warranty. See complete warranty coverage and exclusions details at www.LusioLighting.com.
- **REPLACEABLE LED LIGHT MODULES:** Allows field replacement of individual light modules.
- **AMBIENT OPERATING TEMPERATURES**
Cable, Loop/Hook, and Stem Mounted Fixtures
-31° to 131°F (-35° to 55°C)
Fixtures with Emergency Battery Back-ups and All Surface Mounted Fixtures
-31° to 122°F (-35° to 50°C)

PHOTOMETRIC AND DISTRIBUTION DATA IS TYPICAL FOR THIS FIXTURE. PERFORMANCE WILL VARY DEPENDING ON LED AND POWER SUPPLY. THIS FIXTURE IS MANUFACTURED TO AN OVERALL PERFORMANCE TOLERANCE OF +/- 8%.

18 Lusio Commercial and Industrial Lighting • www.LusioLighting.com • info@LusioLighting.com

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All specifications subject to change without notice. Visit www.LusioLighting.com for updates.

Jim Fowler

From: Don Williams <dwilliam@ncelec.com>
Sent: Tuesday, June 17, 2014 8:43 AM
To: jim@jim-fowler.com
Cc: Matt Helm
Subject: LUCIO Quote

Jim please see below for pricing, we quoted both ways with and without OCSS. Shipping 3-4 weeks. pricing is Prepaid into Anchorage

60 watt

Short, with and without occ sensors

20ea LW-LUSIO-ES2-2MS-40K-CA-BAFN-208-HOOK-OCC40-C6W \$ 427.50ea Total \$ 8550.00 (occ sensor)

20ea LW-LUSIO-ES2-2MS-40K-CA-BAFN-208-HOOK-C6W \$ 341.25ea Total \$ 6825.00

119 watt

4' with and without occ sensors

20ea LW-LUSIO-ES2-2M-40K-CA-BAFN-208-HOOK-OCC40-C6W \$ 537.50ea \$ 10,750.00 (occ sensor)

20ea LW-LUSIO-ES2-2M-40K-CA-BAFN-208-HOOK-C6W \$ 451.25ea \$ 9025.00

Any questions please let us know

Thanks
Don

LED Wall Pack replacement for entry lighting – replacement for 50w HPS or MH

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Home > LED Wall Pack Lighting > 17W LED Wall Pack



17W LED Wall Pack

\$74.90

WP3S-17 ▼

Quantity

1 ▲ ▼

Add to cart

Jarvis Corp 17W VWall Pack

Model Number: VWP3S-17

Important Links:

- [Specifications Sheet](#)

Applications:

- Security, doorway, pathway and perimeter lighting.
- Typical mounting height is 5-10 feet.
- Typical spacing is 2 times mounting height.

Key Features:

- Dark bronze housing
- 120V Input
- Comparable to a 50W metal halide light
- 17 Watts of power
- 5000K Daylight White Color Output
- Aluminum backing plate with conduit entrance on back.
- Polycarbonate enclosure and lens
- 120V dusk-to-dawn photocell Included
- 3 year factory warranty
- ETL Listed



**Manufactured by
Jarvis Corp LED Products
in Chicago, Illinois**

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LED Wall Pack – replacement for 100w HPS or MH



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Home > LED Wall Pack Lighting > 30W Forward Throw LED Wall Pack - Bronze



30W Forward Throw LED Wall Pack - Bronze

\$165.90

WP3FT-30-BRZ ▼

Quantity

1 ▲▼

Add to cart

Jarvis Corp

Model Number: WP3FT-30

30W Forward Throw LED Wall Pack.

Important Links:

- [Specification Sheet](#)
- [5-Year Manufacturer's Warranty](#)

Compatible Photocells/Dusk to Dawn Sensors Available for Purchase:

- [120V Button Photocell](#)
- [120V Stem Photocell](#)
- [208-277V Stem Photocell](#)

Applications:

- Security, doorway, pathway and perimeter lighting
- Typical mounting height is 8-12 feet
- Typical spacing is 2 times mounting height

Key Features:

- Universal input voltage (120-277V)
- Comparable to a 125W metal-halide light
- Dark bronze aluminum housing with prismatic lens
- Conduit entrances on back, side and bottom
- 30 Watts of power
- 5000K Daylight White Color Output
- Easily accepts photo cells (May require field drilling)
- ETL Listed

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now in: [recessed lighting](#) > [led recessed lighting](#) > [led retrofit modules for recessed lights](#) > 6 inch - 9.5 watt - 50 watt replacement - dimmable led downlight retrofit module - gu24 base - wet location - cree

Product Overview:

- GU24 Base
- ENERGY STAR®
- Excellent Color Rendering
- Dimmable to 5%
- Wet location approved
- 5-Year warranty
- [Learn More](#)

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M - F 8am - 6:00pm ET

Have a Question?
 Ask a Q&A about this product
[2 Questions | 2 Answers](#)

6 Inch - 9.5 Watt - 50 Watt Replacement - Dimmable LED Downlight Retrofit Module - GU24 Base - Wet Location - Cree

Item #

CR6-57LS-GU24

Rating

★★★★★ (0 Review)

Price

Reg. Price: \$46.90
Sale Price: \$29.90
You Save: 36% (\$17.00)

Availability

Usually ships the next business day

Quantity

1

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Product Overview:

- Use with NLEDR series
- Converts to GU24 base
- No tools required
- [Learn More](#)

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Email Us
24 / 7

800.392.4818
M - F 8am - 6:00pm ET

Have a Question?
 Ask a Question about this Product

GU24 Socket Adapter for LED Retrofit Modules

Item #

NRA-212

Rating

[Review this item](#)

Price

\$1.70

Availability

Usually ships in 3-4 business days

Quantity

1

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About our GU24 Socket Adapter for LED Retrofit Modules

Back to Top

> Description

> Product Reviews

> Questions & Answers

Description

Back to Top

Use this adapter to install LED retrofit modules in IC or Non-IC GU24 base housings.

- Use: allows [Nora Lighting LED retrofit modules](#) to connect to GU24 base IC or non-IC housings
- Easy to Install: no tools required. Simply remove the E26 medium screw base adapter from LED retrofit module and replace with the GU24 adapter.

Accessories

Nora Lighting LED Recessed Lights

7.3w and 9.6w A-type, screw-in LEDs, 40w & 60w equivalent

amazon Prime

Tools & Home Improvement ▾ LED light bulbs

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◀ Back to search results for "LED light bulbs"



Feit Electric - 60 Watt Replacement - Omni Directional - LED Dimmable - 3 Pack (144799)
by Feit Electric
★★★★★ ▾ 224 customer reviews | 39 answered questions

Price: **\$18.90** (\$6.30 / Pack) ✓ Prime

Note: Available at a lower price from other sellers, potentially without free Prime shipping.

In Stock.
Sold by Citadel Solutions LLC and Fulfilled by Amazon. Gift-wrap available.

- 3 Pack - Feit Electric
- 60 Watt Replacement - Uses 9.6 Watts
- Omni Directional - LED Dimmable
- Lasts over 22 Years
- Soft White - 2700k - Instant On

▶ See more product details

22 new from \$12.99 2 used from \$16.99

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STANLEY **IRWIN**
PROGRESS LIGHTING ▶ Learn more



Feit 7.3 Watt A19 Dimmable LED Light Bulbs 3-Pack (equiv to 40 watts)

by Feit Electric
★★★★★ ▾ 84 customer reviews | 6 answered questions

Price: **\$11.00** ✓ Prime

Only 1 left in stock.
Sold by Warehouse 33 and Fulfilled by Amazon. Gift-wrap available.

- Multi-Use Decorative
- Lasts 22.8 years
- Instant On
- Soft White 2700k, Full Range Dimming
- Mercury Free
- All round light Distribution

▶ See more product details

34 new from \$11.00 3 used from \$8.99

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STANLEY **IRWIN**
PROGRESS LIGHTING ▶ Learn more

13w LED Par30 bulb (2-pack)



Feit Electric 65 Watt LED BR30 Flood Track and Recessed - 2 Pack (144785)

by Feit Electric

★★★★★ 361 customer reviews | 50 answered questions

List Price: \$29.99

Price: \$18.47 (\$0.62 / BULBS) Prime

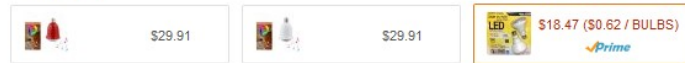
You Save: \$11.52 (38%)

Note: Available at a lower price from other sellers, potentially without free Prime shipping.

Only 4 left in stock.

Sold by RokBuy and Fulfilled by Amazon. Gift-wrap available.

Color: White



- It has an average life of 25,000 Hours. It is also Energy Star approved, RoHS Compliant and mercury free
- This High Powered 10.5 Watt Dimmable Performance LED is a direct replacement for a 65 Watt BR30.
- Usage: Track & Recessed Lighting
- Energy Star Approved
- Instant on to full brightness

[See more product details](#)

32 new from \$10.00 4 used from \$11.50

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Ceiling mounted occupancy sensors



Free ground shipping on orders over \$100
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Click the image to zoom.






2

Videos



Leviton Green Living Products

25% 20% 4x longer

0:00 / 2:22 YouTube

Ceiling Mount Self-Contained Occupancy Sensor, 1000W INC 500VA FL, 220VAC 50Hz, PIR, 360 Degree, 530 sq. ft. Coverage, White, ODC0S-I2W

Not yet rated. Be the first to write a review

Price: \$98.00

Have a question about this product?

Get free ground shipping on all orders over \$100! Here's how (restrictions apply)

[Offer Details](#) [Here's how \(restrictions apply\).](#)

Quantity:

Availability: Usually ships in 1 to 2 days

Product Details

Leviton's self-contained passive infrared ceiling occupancy sensor is the cost-effective choice for commercial and institutional installations, where installation of the recessed ceiling unit is difficult, inconvenient or costly. Available in 120V, 220V and 277V versions, the ODC0S-I is ideal for storage areas, small bathrooms, copy rooms, mop/sink closets or small spaces without wall switches. The self-contained ceiling sensor does not require an external control unit for power or switching the load on and off. 1000W INC 500VA FL, 220VAC 50Hz, PIR, 360-degree, 530 sq. ft. coverage, ceiling mount self-contained occupancy sensor, commercial grade - white.

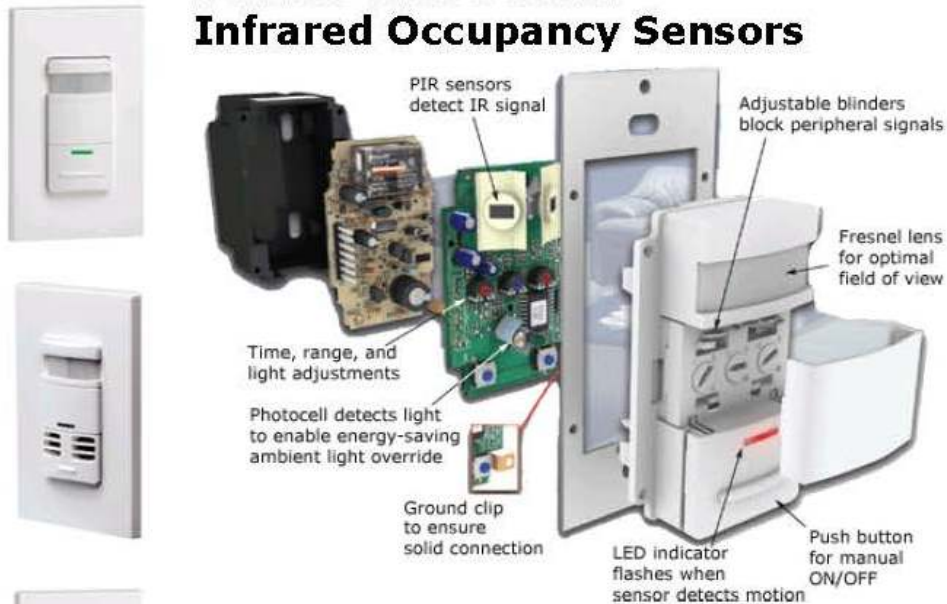
- * Sensor and switching relay in one unit
- * 360 degrees field of view with approximately 530 sq. ft. of coverage when mounted at 8 ft.
- * Adjustable Delayed OFF time setting between 20 seconds and 15 minutes allows custom adjustment for maximum savings
- * LED indicator light flashes when sensor detects motion - to verify power placement and function of sensor at installation
- * Segmented Fresnel lens contains 79 segments for optimum sensitivity and detection performance

For California residents, click [here](#) for Proposition 65 Warning.

Switch mounted occupancy sensors


[Occupancy Sensor Home](#)
[Buy Sensors](#)

Decora Wall-Switch Infrared Occupancy Sensors



Convenient switch and occupancy sensor combo in sleek Decora style unit. Advanced passive infrared technology provides highly accurate monitoring in a variety of commercial applications. The OSSMT Multi-Tech unit combines passive infrared and ultrasonic technologies to provide maximum sensitivity with immunity to false triggering.

Specifications and Features

Ambient light override prevents lights from turning on when there is ample natural light

- ODS0D-ID (Self-Adjusting)
- ODS0D-TD (Self-Adjusting)
- ODS10
- ODS15 (Self-Adjusting)
- OSSMT
- PR150
- PR180

Manual override turns light on at any time regardless of override setting

- All Units

Dual pushbuttons provide manual ON/OFF switching for 2 separate banks from a single unit

- ODS0D-ID
- ODS0D-TD

Exclusive automatic "walk-through sensing increases energy savings by shutting lights within 2-1/2 minutes after momentary occupancy

- ODS0D-ID
- ODS0D-TD
- ODS15
- OSSMT

Unit beeps to indicate load is going to be switched off automatically

- ODS0D-ID
- ODS0D-TD
- ODS10

Choice of "Conference Room" or "Classroom" modes for maximum performance and energy savings in a variety of installations



- ODS0D-ID

Manual delayed-off-time settings: 5, 10, and 20 minutes, with 30-second test mode

- ODS0D-ID
- ODS0D-TD

Manual delayed-off-time settings: 10, 20, and 30 minutes, with 30-second test mode

- ODS10
- IPP15

Manual delayed-off-time settings: 15 seconds to 15 minutes

- PR150
- PR180

Manual delayed-off-time settings: 30 seconds to 30 minutes

- OSSMT
- OSS10

Manual delayed-off-time settings: 30 seconds, 30 minutes, 10 hour, 2 hours

- OSSNL

Three-position service switch with off, auto, on

- ODS0D-ID
- ODS0D-TD
- ODS15

Single-pole and 3-way wiring

- OSSMT
- IPP15
- PR180

Elegant Decora styling complements any interior, uses Decora wall plates

- All Units

Fits in standard wallbox; units may be ganged

- All Units

Night Light mode or "Guide Light" feature

- OSSNL
- OSS10

Night Light dim feature

- OSSNL
- OSS10

Adjustable integral blinders with 180-degree to 32-degree field-of-view

- ODS0D-ID
- ODS0D-TD
- ODS10
- ODS15
- OSSMT
- OSSNL
- OSS10
- IPP15

Manual ON/Auto OFF operation for CEC Title 24 compliance

- ODS0D-ID
- ODS0D-TD
- ODS10
- ODS15
- OSSMT
- OSS10
- IPP15

Ideal for Use In:

ODS0D-ID/ODS0D-TD - Classrooms, multimedia and conference rooms, day care centers, office, lounges

ODS10-ID - Enclosed areas: small offices, conferences rooms, storage rooms, copy rooms, closets

ODS15-ID - Commercial areas: small offices, conference rooms, classrooms, stockrooms, lounges, restrooms, warehouses

PR150-1L - Wide variety of residential applications

PR180-1L - Large rooms, home offices, and a variety of light commercial and residential applications

OSSMT - Private and executive offices, conference rooms, storage areas, restrooms, classrooms, lounges, and training areas

OSSNL/OSS10 - Hotel restrooms, hospital restrooms, conference rooms, class rooms, small offices, lounges, storage areas, and bathrooms

High Bay, Zoned Occupancy Sensor

PRODUCT DATA



OSFHU Passive Infrared Fixture Mount High Bay Occupancy Sensor



BASIC OPERATION

The High Bay Occupancy Sensor is designed simply to automatically turn lights ON or OFF. The sensor utilizes Passive Infrared Technology (PIR) combined with Fresnel Lenses to determine when an area is occupied. This is determined when a heat source is detected and moves from one facet in the lens to another. The sensor recognizes this as motion and provides power to the light fixture. Simultaneously a timer is started and restarts with each motion, once expired, the lights will turn OFF.

The high bay sensor maximizes energy savings, incorporating false detection algorithms to eliminate false ON's by nuisance tripping or background environmental conditions. The sensor also optimizes energy savings and safety concerns during power loss scenarios by assuming a return to last known state of operation.

APPLICATIONS

The OSFHU High Bay Occupancy Sensor is specifically designed and assembled to reduce the amount of labor required during the fixture assembly process and at time of installation.

These sensors are for use in spaces where ceiling heights can vary from 8 to 40 feet, such as warehouses, manufacturing facilities, production, industrial area, and all other high ceiling applications.

It comes with three interchangeable lenses for use in either a 360° high-bay or 360° low-bay general area or an aisle way. The OSFHU provides reliable coverage up to 40 ft. mounting heights. The OSFHU is also available in a model for cold storage applications with temperatures as low as -40° F.

INSTALLATION

The OSFHU mounts directly to an industrial fluorescent fixture or an electrical junction box through a standard 1/2" knockout using the provided lock-nut. Wiring is connected inside the fixture body. To improve the field-of-view for deep body fixtures, a separate offset adaptor accessory (OSFLO or OSFOA) can be used to position the sensor below the fixture body. The adapter simply snaps into a 1/2" knockout on the end of the industrial fixture to attach the sensor. The OSFHU and OSFLO/OSFOA provides the most labor savings available with quick snap, 42" wire leads, and no power required to configure.

OSFHU

Leviton Mfg. Co., Inc. Lighting & Energy Solutions

201 N. Service Rd. Melville, NY 11747-3138 Tech Line: 1-800-824-3005 Fax: 1-800-832-9538 www.leviton.com/les
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PRODUCT DATA

FEATURES

Quicksnap: built into the 1/2" nipple, this locking mechanism allows for the fastest and easiest mounting not requiring a threaded lock-nut.

Reduce time and materials: easily reach the ballast at either end of the fixture without requiring more wire or connectors with the included 42" wire leads.

Fast, easy time delay setting: can be set at any time without requiring power to the sensor; time delay is variable from 30s-20m.

Instantly verify fixture operation and wiring connections: "instant ON" closing relay fires lamps in under 5 seconds.

High Inrush Stability (H.I.S. Technology):

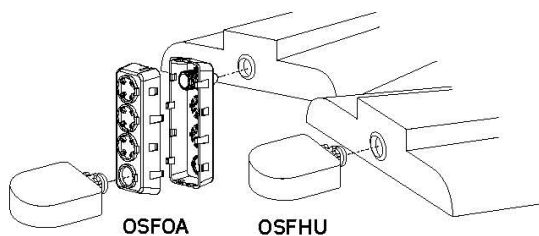
- Zero crossing circuitry optimizes relay operation for reliable, long-life operation
- Robust mechanical latching relay is durable for all load types

Auto temperature calibration: automatically adjusts the PIR sensitivity as ambient temperature rises to increase detection of heat movement through the field-of-view.

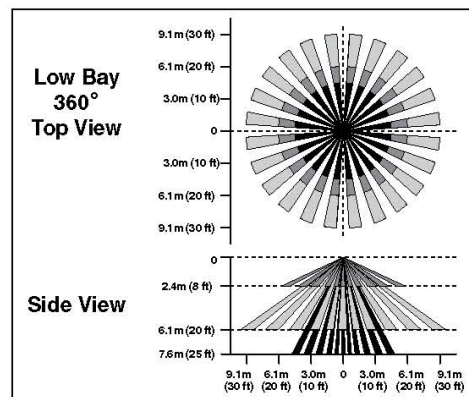
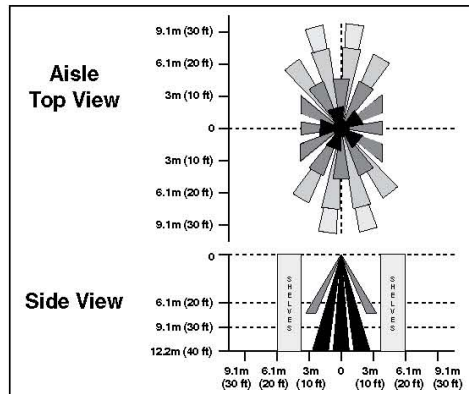
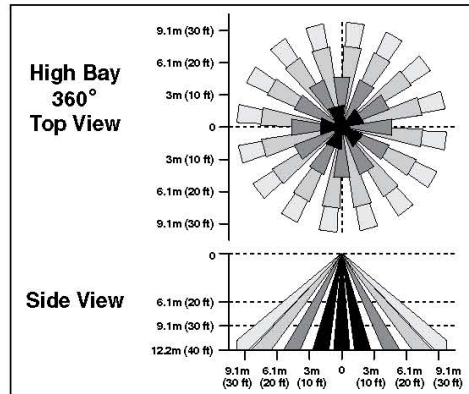
Return to last state: for safety and energy savings, the OSFHU contains a latching relay so that in the event power is lost to the device, the device will return to the last known state of the relay.

False detection intelligence: for increased energy savings and to mitigate nuisance tripping, the super bright LED indicates advanced detection has been activated and the lights will only turn ON when true occupancy has been determined.

ASSEMBLY WITH OFF-SET ADAPTOR

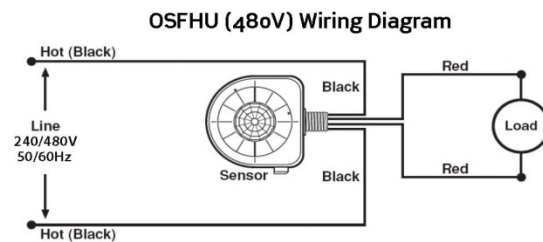
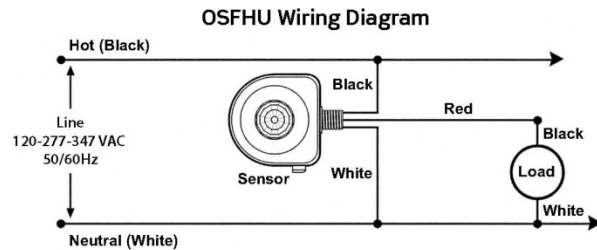


FIELD-OF-VIEW



**SPECIFICATIONS**

ELECTRICAL	
Input Voltage	120-230-277-347VAC; 240/480VAC (-I4W models)
Operational Frequencies	50/60Hz
Load Rating	800VA @ 120VAC Ballast 1200VA @ 277VAC Ballast 1500VA @ 347VAC Ballast 2000VA @ 480VAC Ballast Motor: 1/4 HP Load @ 120V
Standby Power Consumption	120V - 130mW - .13W 277V - 450mW - .45W 347V - 460mW - .46W
Time Delay	30 seconds-20 minutes (factory set to 30 sec - no power required to set)
Wire Designation	-ITW/-CTW models: Line-Black, Load-Red, Neutral-White -I4W/-C4W models: Line-Black, Load-Red, Load-Red
ENVIRONMENTAL	
Operating Temperature Range	14° F to 160° F (-10° C to 71° C)
Cold Storage Operating Temperature Range	-40° F to 160° F (-40° C to 71° C)
Storage Temperature Range	-14° F to 160° F (-25° C to 71° C)
Relative Humidity	20% to 90% non-condensing
PHYSICAL	
Dimensions	OSFHU: 3.50" H x 3.50" W x 1.25" D OSFOA: 5.50" H x 2.00" W x 2.00" D OSFLO: 4.325" H x 2.00" W x 2.00" D
Construction	High-impact, injection molded plastic housing
Color	White
OTHER	
Agency Listings	UL and CUL Listed (OSFHU models)
Warranty	Limited 5-Year

WIRING DIAGRAM**ORDERING INFORMATION**

CAT. NO.	DESCRIPTION
OSFHU-ITW	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses, White
OSFHU-CTW	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses for Cold Storage, White
OSFHU-I4W	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses, 480V, No Neutral, White
OSFHU-C4W	PIR Fixture Mount High Bay Sensor with 3 Interchangeable Lenses for Cold Storage, 480V, No Neutral, White
OSFOA-00W	Offset Adapter Accessory for OSFHU, 3 Position, White
OSFLO-00W	Offset Adapter Accessory for OSFHU, 1 Position, White
OSFCG-00W	Protective Cage for Fixture Mounted Sensors

NAFTA and Made in USA models available.

Leviton Mfg. Co., Inc. Lighting & Energy Solutions

201 N. Service Rd. Melville, NY 11747-3138 Tech Line: 1-800-824-3005 Fax: 1-800-832-9538 www.leviton.com/les
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OSFHU

DHW re-circulation pump with integral timer



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Grundfos Comfort System Hot Water Recirculator System , UP15-10 SU7P TLC, 595916, Comfort Valve

Item #: T9FB925935
Sold By: globalindustrial.com

Usually ships in 10 to 13 days

★★★★★ 2 reviews | Write a review

Price: \$287.95

Calculate Shipping

Quantity:

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Add to list

Product Information | Customer Review | Product Q&A

Grundfos Comfort System Hot Water Recirculator System , UP15-10 SU7P TLC, 595916, Comfort Valve

Grundfos Comfort System - Hot Water Recirculation System The water circulation system that eliminates cold water runoff at the faucet using a bypass valve and pump with a timer to control water flow. Hot Water Recirculation - Special Features- The ultimate in convenience is having hot water instantly available at sinks, appliances and bathroom faucets. The elimination of time spent waiting is especially convenient in areas where the installation of low flow showerheads and faucets are required by law. Hot water recirculation improves the efficiency and effectiveness of household appliances including washing machines and dishwashers by having hot water available instantly. Users can save energy by setting the 24 hour programmable timer to make hot water available during peak demand times, such as early morning and in the evening. The recirculation pump can be installed by a certified contractor in two hours. For the average home, hot water recirculation systems generally cost a few hundred dollars, including parts and installation. A wet rotor design for whisper-quiet and maintenance-free operation. Stainless steel rotor cladding and canister construction, an exclusive UP 15 series feature, ensures corrosion-resistance and extended product durability. A low-watt, two-pole motor combined with low-flow performance ensures minimum water heater operating costs, pipe and water heater wear and energy consumption. Significant water (and sewer) disposal savings, retaining the 12,000 to 38,000 gallons of water a typical U.S. home wastes annually waiting for hot water. Some fast-growing counties are making the installation of hot water recirculation pumps mandatory for all new construction projects.

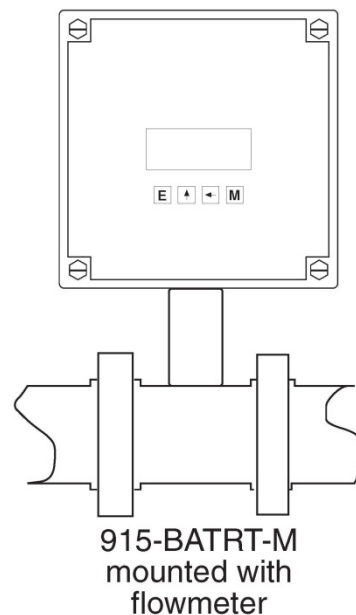
Product Specifications

BRAND	Grundfos
LENGTH INCHES	5-7/16
WIDTH INCHES	5-1/2
HEIGHT INCHES	6-1/4
COLOR	Red
CONSTRUCTION	Stainless
VOLTAGE	115
PHASE	1
INCLUDES	Timer and Line Cord
MANUFACTURER'S PART NUMBER	GF595916
MODEL	UP15-10 SU7P TLC
HEAD FEET	0-8
FLOW U.S. GPM	0-8-1/2
MAX. SYSTEM PRESSURE	145 PSI
MIN. FLUID TEMPERATURE	36°F (2°C)
MAX. FLUID TEMPERATURE	150°F (66°C)

Cumulative fuel oil flow meter

Sensor must be calibrated at factory for #1 diesel from .1 to 7 gph. Square plastic display is NEMA rated, round is explosion proof (not required). Display can be mounted directly on sensor. Sensor has female 1/2" NPT, factory can install 3/8" or other adapter, as required. Meter has flow rate and totalizer.

Battery or Loop Powered Ratemeter & Totalizer





Flowmetrics, Inc.

9201 Independence Avenue
Chatsworth, CA 91311

"Where Quality is Measurable"

(818) 407-3420
(800) 356-6387
Fax (818) 700-1961
Email: information@flowmetrics.com

Tangential Turbine Flowmeter - FMT Series

Special Features:

- Well suited to meet a variety of process media
- Capable of measuring extremely low flow rates as .001 GPM in liquids and .001 ACFM in gases
- High output and low drag magnetic pickoffs
- Zero drag modulated carrier pickoffs*
- Bearings to suit specialized applications
- NIST traceable calibration

*Modulated carrier pickoff requires a pre-amplifier – please refer to the PA/PC/PS/LS Brochure



General:

The Flowmetrics Tangential turbine flowmeter is a unique volumetric device. This uses a dual orifice design to direct a stream of fluid tangent to a low mass/balanced rotor and a precision bearing to provide maximum sensitivity. This arrangement permits the measurement of very low flow rates in either liquid or gas service under a variety of operating conditions with high degree of precision and reliability. This geometry also eliminates the need for flow straighteners and allows for greater repeatability.

The unit produces an electrical output with pulse frequency proportional to the flowrate. These pulse can be fed into digital data display, frequency to DC analog, totalizing or into one of many recording equipments available from Flowmetrics, Inc., to provide full fluid flow measurement capability.



9201 Independence Avenue
Chatsworth, CA 91311
USA

(800) 356 6387 • (818) 407-3420
FAX (818) 700-1961

June 14, 2013

Mr. Jim Fowler
Energy Audit of Alaska
Tel: 206 954 3614 /Fax:
E-mail: jim@jim-fowler.com

Our Ref: Quote # 1306221

Dear Jim,

We are pleased to quote the following flow meter & display, which will accurately Diesel #1 Fuel

1. P/N: FMT-8-7NX1-0.070-LD1L Price/each: US\$ 880
Turbine Flowmeter (FMT Series):
 - Process Connection: ½ " NPT (Female)
 - Calibration Range: 0.50 – 3 GPH for Diesel # 1 Fuel at ambient conditions
 - Accuracy: +/- 0.5% Reading
 - Materials of Construction: 316 Stainless Steel except with 440c stainless steel ball bearing
 - Magnetic pickup coil

2. P/N: 915BATRTM5A4 Price/each: US\$ 434
Digital Display:
 - Battery powered
 - Displays Rate and Total simultaneously
 - Mounted integral to flowmeter in a NEMA-4x enclosure

Delivery: 1 - 2 Weeks ARO
F.O.B. Factory
Quoted prices are firm for 60 days

Thank you for the opportunity to quote your requirements. Please do not hesitate to contact our office if you have any questions. We look forward to being of further assistance.

Very truly yours,

Irfan Ahmad
Sales/Application Manager
irfan@flowmetrics.com

Schedule, Events, and Programs

Visit ykfitness.org for the most up to date schedules and information.

We continue working on boosting staff for all operations positions, particularly Lifeguards and attended 2 career fairs during April. One at YKHC and the other a virtual fair help by LKSD.

We did not have anyone register for our April swim instructor training and only 2 registrants for our April LG class. We are offering another Lifeguard training course at the end of May. We are also actively hiring for our summer Healthy Activities Club staff.



On May 3rd we are partnering with the Kid's Don't Float program and the US Coast Guard to provide water and boating safety activities for Bethel students.



Ongoing



The Lifesavers Foundation continues to sponsor Free Teen Wednesdays Free Fridays for Seniors/Elders (age 60+), and Half Price Saturdays.



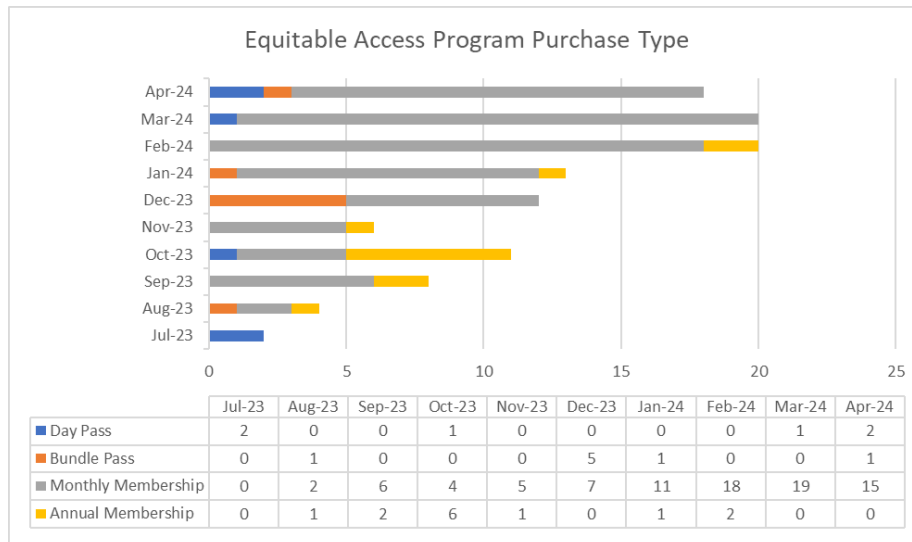
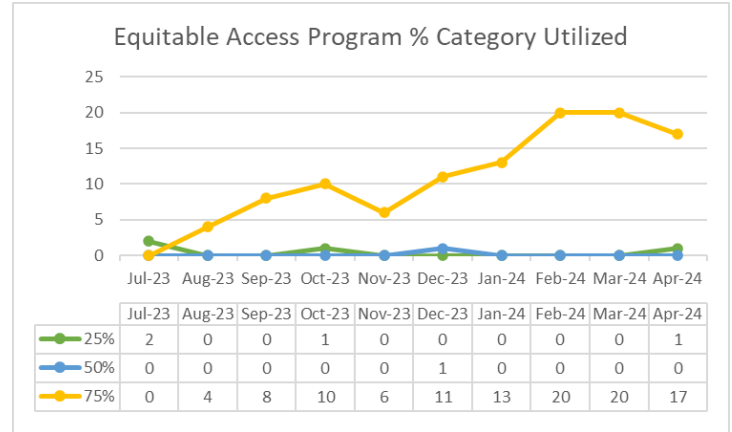
Equitable Access Program

We continue to offer the Equitable Access Program to provide discounted access to the facility for community members who may not be able to afford the full cost of facility access. Utilization of the Equitable Access Program has been growing slowly, but steadily since implementation, but plateaued in March and dipped slightly in April.

The table to the right shows the total number of purchases made per month utilizing each of the discount categories available. By far the bulk of purchases are under the 75% category.

The table below shows the types of purchases made by individuals utilizing the EAP. There was a boost in Annual Membership purchases during PFD Season and an overall drop off of purchasing during November, which we commonly see after PFD season.

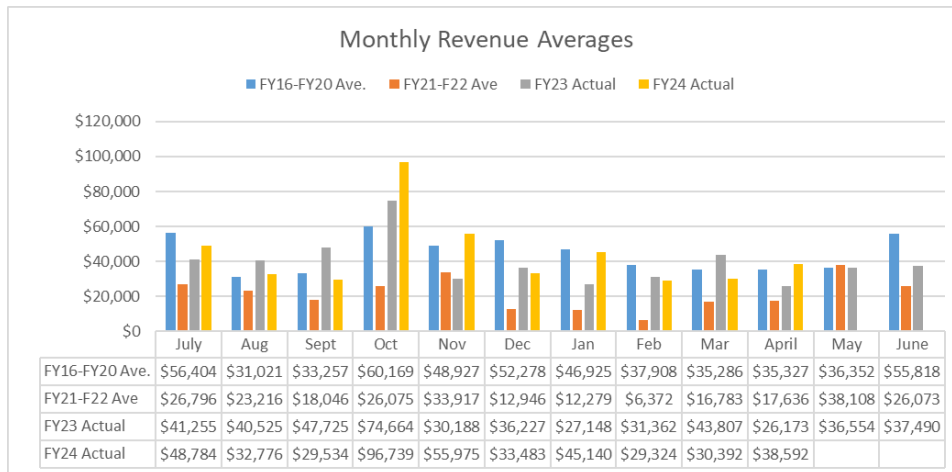
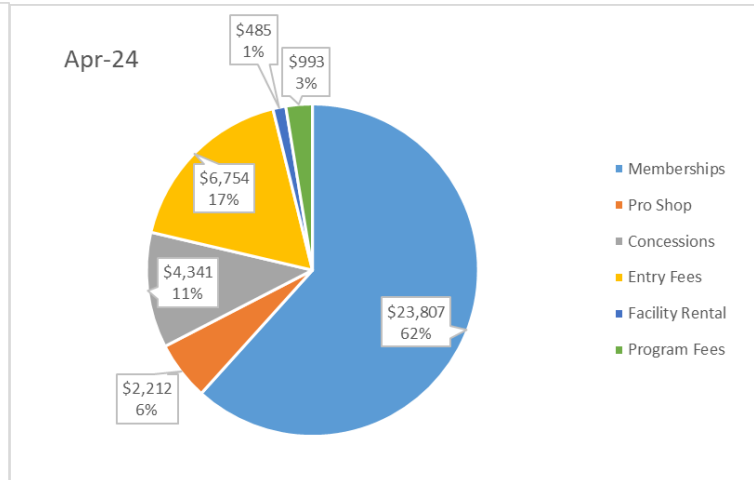
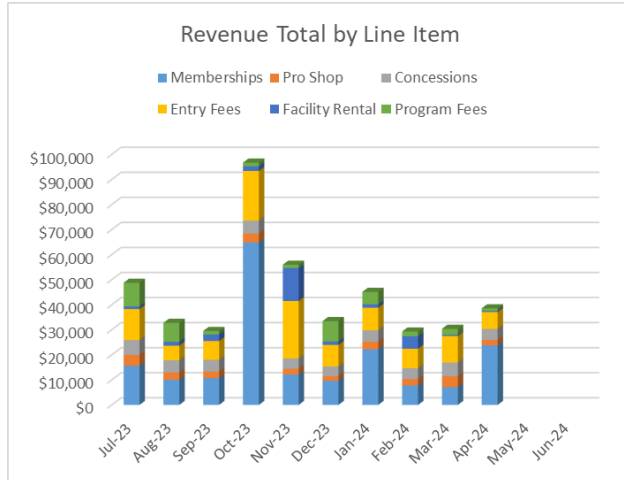
Purchasing has slowly increased from December 2023 – February 2024 in part due to increased marketing of the program. The most common purchases are monthly memberships. Membership purchasing traditionally slows during the spring and summer months, and we see a plateaued in March and slight dip in April. We anticipate that this trend will continue over the summer especially as we continue to struggle to provide recreational swimming for youth due to the ongoing lifeguard shortage.



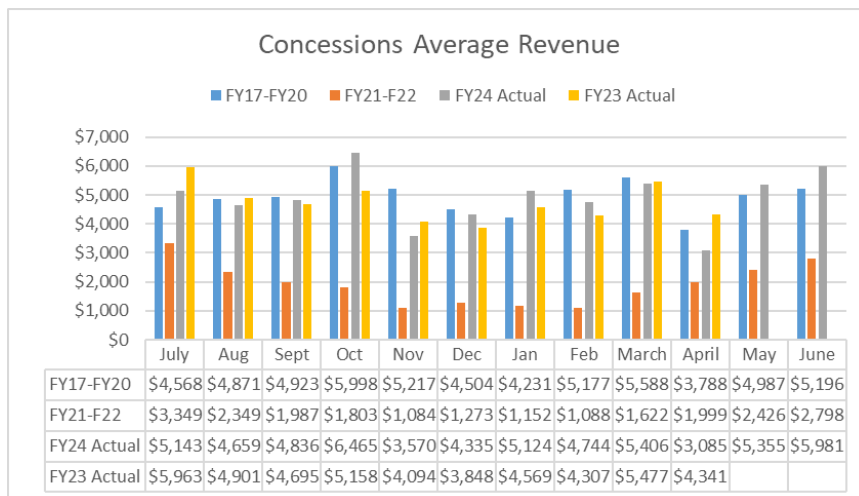
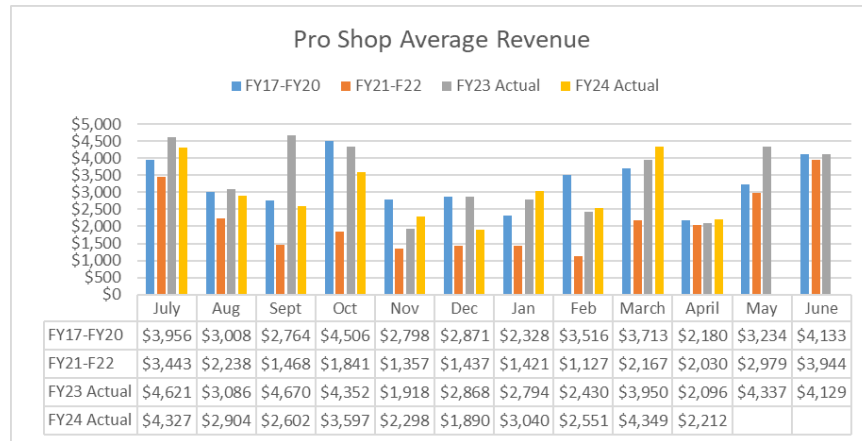
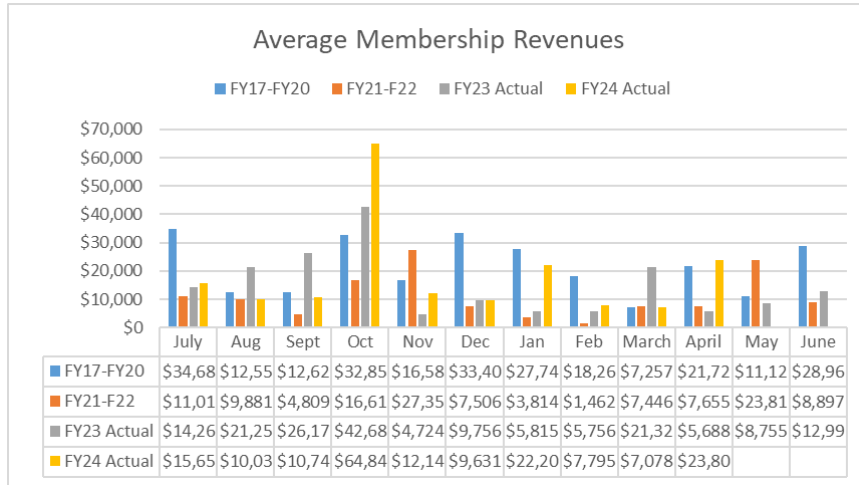
YKFC Report, FY24, 2024 April

Revenue

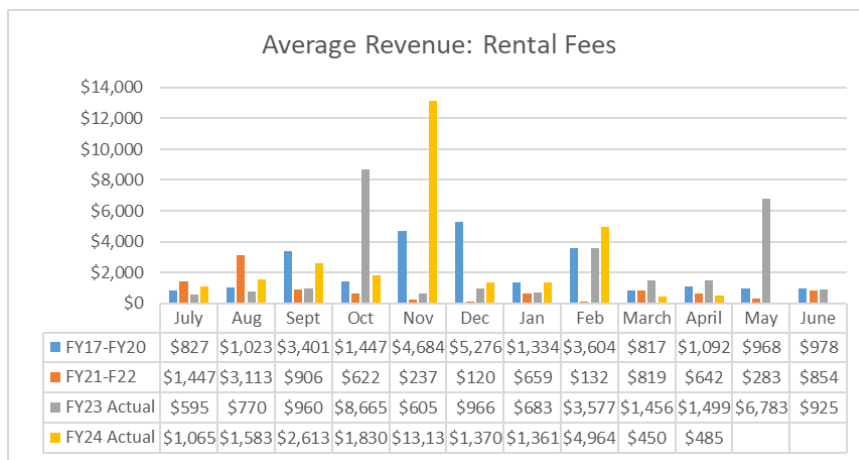
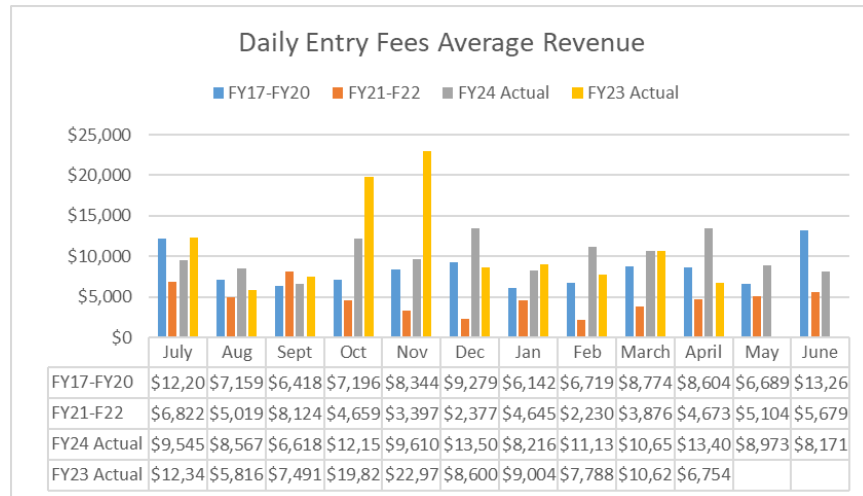
Code	Facility Revenue	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Total	FY24 Budgeted	%attained
43-9420	Memberships	\$15,651	\$10,036	\$10,742	\$64,844	\$12,142	\$9,631	\$22,204	\$7,795	\$7,078	\$23,807			\$183,929	\$250,000	74%
43-4360	Pro Shop	\$4,327	\$2,904	\$2,602	\$3,597	\$2,298	\$1,890	\$3,040	\$2,551	\$4,349	\$2,212			\$29,771	\$42,000	71%
43-4361	Concessions	\$5,963	\$4,901	\$4,695	\$5,158	\$4,094	\$3,848	\$4,569	\$4,307	\$5,477	\$4,341			\$47,353	\$60,000	79%
43-4362	Entry Fees	\$12,345	\$5,816	\$7,491	\$19,828	\$22,976	\$8,600	\$9,004	\$7,788	\$10,627	\$6,754			\$111,229	\$115,000	97%
43-4440	Facility Rental	\$1,065	\$1,583	\$2,613	\$1,830	\$13,135	\$1,370	\$1,361	\$4,964	\$450	\$485			\$28,855	\$26,000	111%
43-4369	Program Fees	\$9,434	\$7,538	\$1,391	\$1,482	\$1,329	\$8,145	\$4,962	\$1,919	\$2,410	\$993			\$39,603	\$50,000	79%
Misc (Grants, Donations, Etc.)														\$0	\$0	
Facility Revenue Total		\$48,784	\$32,776	\$29,534	\$96,739	\$55,975	\$33,483	\$45,140	\$29,324	\$30,392	\$38,592	\$0	\$0	\$440,739	\$543,000	81%



Revenue Comparisons by line Item: Facility access fees (memberships and passes) constitute the bulk of revenue.



YKFC Report, FY24, 2024 April

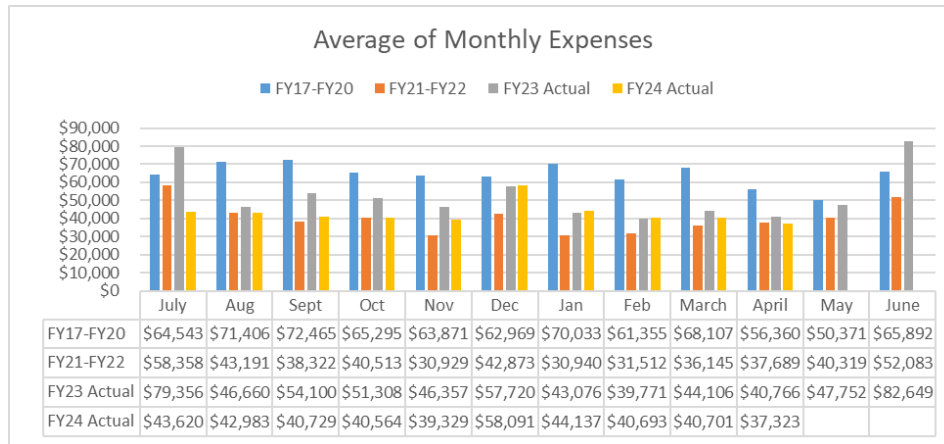


Expenses

	Expenses	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	Total	Budgeted	% used
	Wages & Benefits	\$37,934	\$37,727	\$35,473	\$33,975	\$33,989	\$53,210	\$37,966	\$35,853	\$36,585	\$32,187	\$374,899	\$609,921	61.47%
6060	Travel/Training	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000	0.00%
6100	Supplies	\$2,408	\$2,695	\$3,804	\$2,675	\$2,178	\$1,729	\$3,348	\$3,312	\$2,362	\$3,624	\$28,135	\$74,000	38.02%
6110	Building Maintenance	\$565	\$705	\$220	\$356	\$1,313	\$1,901	\$473	\$380	\$467	\$352	\$6,733	\$16,100	41.82%
6331	Software Licenses	\$511	\$345	\$312	\$1,201	\$833	\$347	\$551	\$330	\$318	\$453	\$5,202	\$500	1040.33%
6200	General Expenses	\$1,559	\$933	\$839	\$2,356	\$1,016	\$904	\$1,577	\$818	\$969	\$708	\$11,680	\$10,300	113.39%
6430	Allowance for Special Events	\$0	\$186	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$186	\$1,000	18.65%
6539	Unforeseen	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000	0.00%
	Non Budgeted /Grant Funded	\$642	\$392	\$80	\$0	\$0	\$0	\$221	\$0	\$0	\$0	\$1,335		
	TOTAL	\$43,620	\$42,983	\$40,729	\$40,564	\$39,329	\$58,091	\$44,137	\$40,693	\$40,701	\$37,323	\$428,169	\$715,821	59.82%

* Due to our 2 week pay period structure there are 2 months out of each year where 3 pay periods fall, skewing wage totals upwards for those months.

**Expense totals do not include purchases made by City of Bethel Property Maintenance or other direct city expenses.



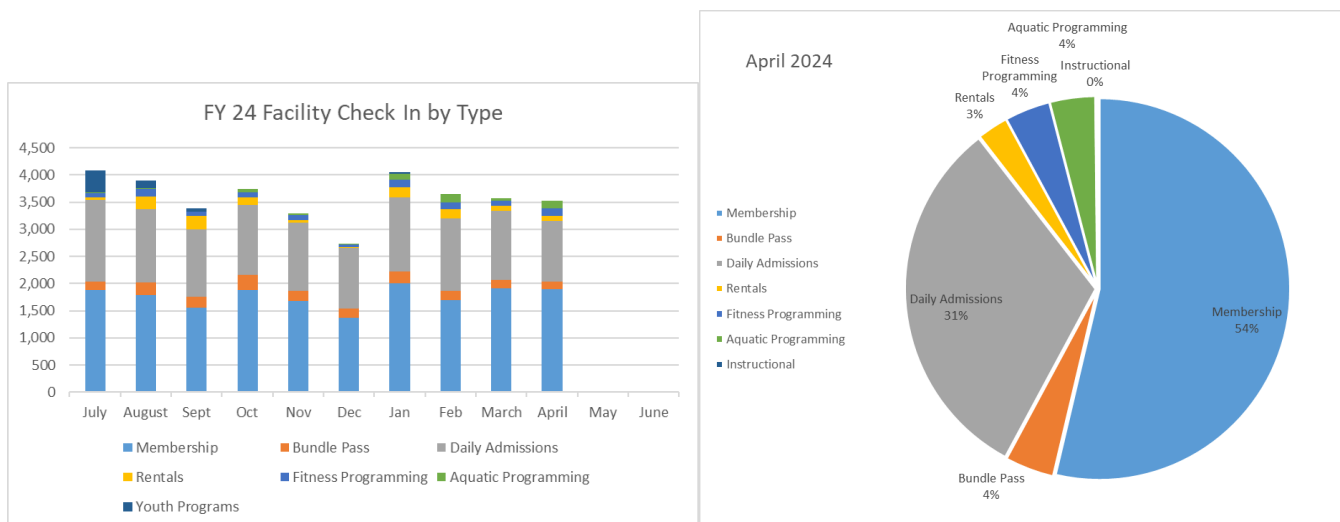
Facility Utilization

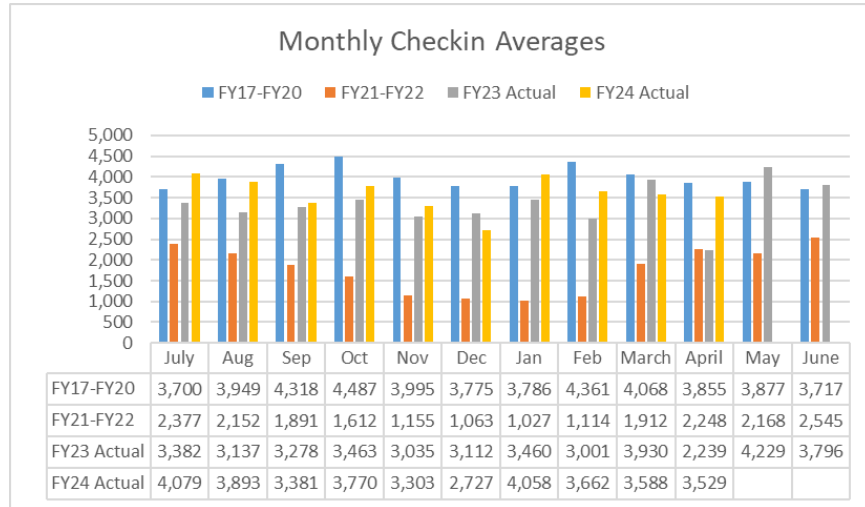
The Below Facility utilization numbers represent the total number of patrons who visited the facility over the course of the month based on the number of check -ins by members and bundle pass holders, the number of daily passes sold, and the number of participants who checked in for programs, activities, rentals, and events.

These numbers represent facility visits, not individuals, as most individuals visit multiple times per month.

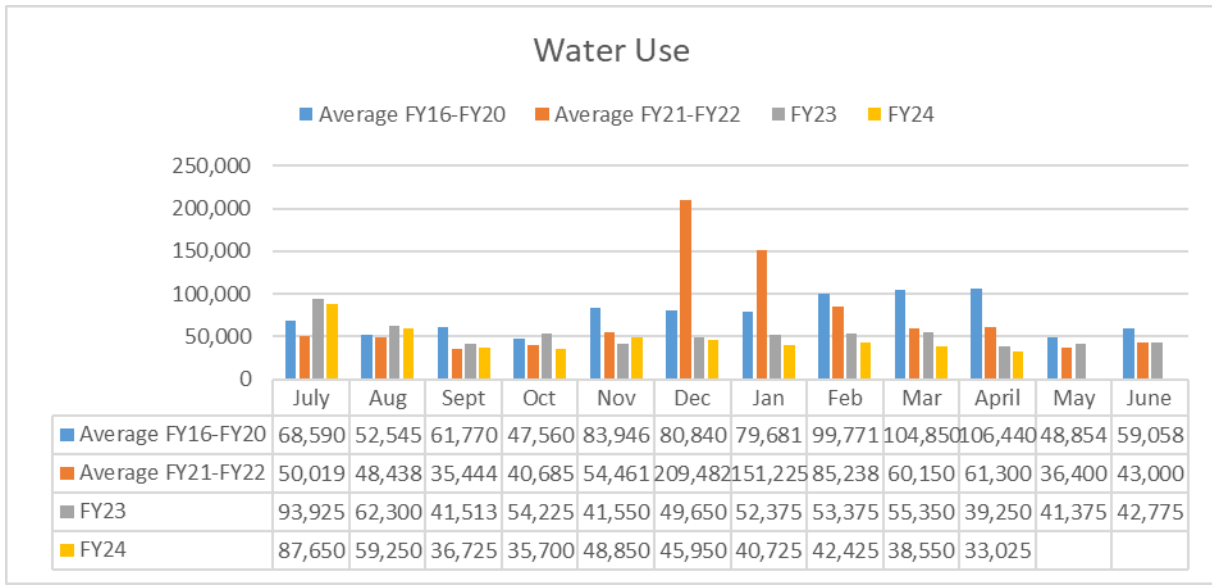
Facility Check-In FY24	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Total
Membership	1,880	1,794	1,560	1874	1682	1368	2003	1700	1,908	1,895			17,664
Bundle Pass	151	220	195	289	180	166	224	160	152	147			1,884
Daily Admissions	1,515	1,354	1,237	1284	1263	1118	1366	1346	1,287	1,116			12,886
Rentals	49	232	248	144	44	14	179	170	80	93			1,253
Fitness Programming	69	143	92	86	88	58	136	126	95	136			1,029
Aquatic Programming	15	18	0	69	36	3	112	150	53	136			592
Instructional	0	0	0	24	10	0	6	10	13	6			69
Youth Programs	400	132	49	0	0	0	32			0			613
Monthly Totals	4,079	3,893	3,381	3,770	3,303	2,727	4,058	3,662	3,588	3,529	0	0	35,990

Facility utilization for April was close to utilization for March and exceeded far utilization compared to April 2023 when we had a facility maintenance shutdown.





Water Use



*Note: Facility opened in November of 2014 (FY15). Starting during maintenance closure in Dec 2019/Jan 2020 hot water has been used to keep pipes from freezing resulting in higher-than-normal usage. Water was turned off in late March 2020 once outside temperatures were consistently above freezing temperatures. Problems again arose in Dec 2020 and water was used to assure there were no freeze ups of facility piping through early March 2021.