

Administrative Building Energy Audit

December 4, 2007

Executive Summary

The Administrative Building was built in 1972. It has a combined energy usage of \$1.32 per sq. ft. per year, which is moderate for county buildings. The Admin. Building is an all electric building. Recently the HVAC system was upgraded to include two new heat pumps for the second floor. The remaining HVAC system is badly deteriorated and in need of replacement. There are 20 window A/C units in the building and over 12 space heaters in use during the winter. This is an indication that there are serious problems maintaining comfort in the building. Possible energy savings for the building are in the range of 15-20%. This would mean a savings of at least \$3,000 to \$4,000 per year.

The largest opportunity for savings lies in providing a new efficient heating and cooling system for the building which would include an automated energy management system. This would allow the window A/C units to be removed and thus remove one large source of air infiltration. Storm windows need to be kept shut at all times, and missing storm windows replaced. An upgrade of the lighting system could yield large savings as well by installing energy efficient lighting and modern controls.

The Admin. Building is a prime target for energy improvements. With efficient systems and sound operating and maintenance it could earn a Energy Star rating to be among the top 25% of buildings of its type. Furthermore repair costs would be drastically reduced with new systems.

Submitted by: Curtis Putnam

Recommendations from Energy Audit of Admin. Bldg.
12-4-2007

- Current heating and A/C system is malfunctioning and beyond repair. Replace with engineered system. (Evidence: 20 window A/C units being used and nearly as many space heaters in place.)
- Thermostats malfunctioning
- Zone valves worn and failing
- Piping for system near end of useful life
- Install an automated energy management system
- Seal all windows permanently shut.
- Seal all storm windows permanently shut.
- Repair cracked windows
- Replace missing storm windows
- Consider replacing windows with double pane non-operable glazing
- Insulate water heater
- Consider reducing lighting in hallways by 50%
- Consider reducing lighting in non-task areas by 50%
- Remove two bulbs and disconnect ballast in 4 lamp fixtures.
- Consider reducing ambient lighting and using task lighting
- Consider switching to T-8 lighting for efficiency

2. ANNUAL ELECTRIC USE AND COST
 Include Electrical Demand, if applicable

Building		Address		Year of Record		Utility		Building size (sqft)	
Administrative Bldg.		132 Main St Palmyra, VA 22983		From 01/01 To 12/31/07		Dominion Virginia Elec		15,300	
Account Number		Meter Number		Minimum Power Factor W/O charge		KW-KVA Demand		P.F. * and Demand Cost***	
1404067564		0115036629							
Maximum kW Demand W/O charge		KW/h/gross sq.ft. **		Annual (EUI) BTU/sqft (000)		Energy Cost		Fixed Service Cost	
1	2	3	4	5	6	7	8	9	10
Meter Read From	Meter Read Date To	KWh* Used	KWh/gross sq.ft. **	Annual (EUI) BTU/sqft (000)	Energy Cost	KW-KVA Demand	Fixed Service Cost	P.F. * and Demand Cost***	Total Cost
6-24	7-25	22,440			1,485.67				
7-25	8-23	20,160			1,396.54				
8-23	9-22	19,200			1,393.44				
9-22	10-23	16,680			1,322.41				
10-23	11-22	29,160			2,145.66				
11-22	12-22	29,760			2,133.40				
12-22	1-24	33,480			2,220.00				
1-24	2-22	45,120			2,932.91				
2-22	3-23	21,840			1,468.46				
3-23	4-24	20,640			1,417.11				
4-24	5-23	12,240			876.38				
5-23	6-22	20,040			1,455.50				
TOTAL		299,760	19,003	64,860	20247.58				

Annual Cost = \$1.3234/sqft.

Comments:

Conversion: 3413 BTU/kWh

*KW - Kilowatts, KVA - Kilo-Volt-ampere, KWH - Kilowatt hour, P.F. - Power Factor

**Total annual kWh divided by the building's gross sq. ft.

***If demand and/or power factor are metered and billed, energy cost here.

11. ENERGY SAVINGS

INSTRUCTIONS: This section is to be completed by the auditor after the walk-through portions of the audit. First, check the boxes which state the range of the percent of energy consumption which would be saved by implementing the operation and maintenance items recommended in section 2 of this book. Second, calculate the range of energy and cost savings by multiplying the estimated percentages by the annual electrical and fuel consumption date on this audit report.

Check two boxes in each category:

Range of Electrical Savings [] 0% [] 5% [] 10% 15% 20% [] 25% [] Other _____

Range of Fuel Savings ~~N/A~~ [] 0% [] 5% [] 10% [] 15% [] 20% [] 25% [] Other _____

Calculate ranges of energy and cost savings:

Range of Electrical Savings								
	% Range	Annual Electrical consumption kWh	=	Range of Electrical savings kWh	% Range	Annual Electrical dollars spent	=	Range of Electrical Dollar savings
Lower Bound	15	X 290,760	=	43,614	15	X \$20,248	=	\$ 3,037,20
Upper bound	20	X 290,760	=	58,152	20	X \$20,248	=	\$ 4,049,60

Range of Fuel Savings								
	% Range	Annual fuel consumption Btu	=	Range of fuel savings Btu	% Range	Annual Fuel dollars spent	=	Range of Fuel Dollar savings
Lower Bound		X	=			X	=	
Upper bound		X	=			X	=	

The auditor is not responsible if actual savings resulting from the implementation of the energy conservation opportunities listed in this section do not fall between the roughly estimated ranges which are specified.

Total Range of operation and maintenance energy savings (total all fuels):

From 43,614 Btu to 58,152 Btu.
 (lower bound) (upper bound)

Comments: