Treasurer's Office Energy Audit
December 17, 2007
Executive Summary

The Treasurer's office was originally built in 1913 with an addition put on in 1951. It has an energy usage of $1.23 per sq. ft. per year, which is moderate for County buildings and for buildings of its type. It is heated with an oil fired boiler and cooled with two A/C split units with three window A/C units in the basement. Consumer complaints about comfort are frequent and 10 or more space heaters are in use during winter. Possible energy savings for the building are in the range of 10-15%. This would mean a savings of $900 to $1400 over the next year.

The largest opportunity for savings lies in upgrading to programmable thermostats and adjusting temperatures during off hours, weekends and holidays. Some opportunity exists in replacing ballast in lights with electronic ballast and delamping some fixtures by 50%. Adding occupancy sensors to seldom used areas could save energy. Storm window should remain closed. Temperatures should be set to remain in the range of 68-72°F in the winter and from 78-75°F in the summer.

Submitted by: Curtis Putnam

Recommendations from Energy Audit of Treasurers Office.
11-29-2007

- Close and permanently seal all storm windows.
- Permanently seal all windows.
- Replace any cracked or broken windows.
- Insulate roof.
- Instruct personnel to close interior shading devices to reduce night heat loss in winter and to reduce solar gain during the summer. Place reminders where appropriate.
- Install and automated energy management system that will control all spaces in accordance with usage.
- Install programmable, pre-set solid state electric thermostats.
- Adjust thermostats to 68 °F during the heating season and 78 °F in the cooling season.
- Reduce thermostat settings by a minimum of 10°F at nights, and holidays during heating season.
- Shut down air conditioning units on weekends and holidays.
- Remove obstruction to air inlet in boiler room.
- Test boiler efficiency regularly and keep a log of test results.
- Cover window units during winter.
- Insulate hot water tank.
- Switch off lights when daylight is sufficient.
- Clean windows.
- Consider not replacing burned out bulbs or lamps and disconnecting ballasts in areas where delamping is possible. For example, in a four lamp fixture, allow two lamps to remain, disconnecting appropriate ballasts.
- Replace defective ballasts with electronic ballast.
- Consider lowering fixtures to increase illumination levels on the task area, and permit a reduction in the number of fixtures.
- Reduce overall illumination and install task lighting.
- Add occupancy sensors to circuits in seldom used areas, e.g. bathrooms and storage areas.
- Disconnect vending machines on weekends and holidays. (consult with vending company)

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

Building Treasurer's #2	Address 34 Palmyra Way Palmyra VA 22963	Year of Record From Aug 06 / July 07 To
Account Number 1024205005	Meter Number S/N- 05753287	Utility Dominion VA
Maximum kW Demand W/O charge N/A	Minimum Power Factor W/O charge N/A	Building size (sqft) 7,229

1	2	3	4	5	6	7	8	9	10
Meter Read Date From	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
6-22	7-25	9262			674.46				
7-25	8-23	8016			593.98				
8-23	9-22	6697			517.47				
9-22	10-23	4986			407.61				
10-23	11-22	4914			391.89				
11-22	12-22	4470			339.00				
12-22	1-24	4331			309.10				
1-24	2-22	4817			341.43				
2-22	3-23	4235			306.82				
3-23	4-29	5683			426.79				
4-29	5-23	5300			411.98				
5-23	6-22	9126			722.24				
TOTAL		71,837	9.937	33916	$5442.77				

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.

3. ANNUAL NON-ELECTRIC ENERGY USE AND COST

Photo copy this form for additional fuel types

Building	Address	Year of Record From / To
Treasurer's (2)	34 Palmyra Way	Aug 06 / July 07
Account Number	**Meter Number**	**Utility**
944/3260		Tiger Fuel
Building Size (sq ft)	**Fuel Type**	**Specify Units**
	#2 Heating	gal

Billing Period From	To	Fuel consumption	Conversion Factor	MMBTU	Annual (EUI) Btu/sq.ft.	Cost $
	10-31	1000gal	138,690	138.690		2031.88
	1-31	507	138,690	70.316		1030.26
	4-30	207	138,690	28.709		420.40
TOTAL		1714		237.715	32,883	$3482.54

***Conversion Factors**

Natural Gas	100,000 Btu/therm
Natural Gas	1,030 Btu/cubic feet
Liquified Petroleum	(LP bottled gas) 95475 Btu/gallon
Kerosene	134,000 Btu/gallon
Distillate Fuel Oil	138,690 Btu/gallon
Residual Fuel Oil	149,690 Btu/gallon
Coal	24.5 million Btu per Standard short ton
Wood	8,680 Btu/pound
Steam	970 Btu/pound
Other	Consult standard Engineering Reference Manual

Comments: Elec = $5,442.77
Fuel = 3482.54
$8,925.31 / 7,229 = $1.2346/sq Ft.

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% [X]10% [X]15% [ ]20% [ ]25% [ ]Other____

Range of Fuel Savings [ ]0% [ ]5% [X]10% [X]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	10	X	71,837	=	7,184	10	X	$5442	=	$544.20
Upper bound	15	X	71,837	=	10,775	15	X	$5442	=	$816.30

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	10	X	237,715,000	=	23,771,500	10	X	$3483	=	$348.30
Upper bound	15	X	237,715,000	=	35,657,250	15	X	$3483	=	$522.45

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 48,298,492 (lower bound) Btu to 72,447,325 (upper bound)

$ 892.60 to $ 1338.75

Comments: