

MEMO



To: Clayton Cole, Slaterpaul Architects
Robert Lee, Slaterpaul Architects

Project: St. Andrew United Methodist Church

Re: DD Energy Analysis and Summary of Xcel Energy Incentives

Date: June 10, 2009

From: Mike Kaufman, ambient energy

Cc: Linda Morrison, ambient energy

A Design Development energy analysis has been completed to inform the building committee of the likely utility costs and energy efficient design of this project. The analysis has also been used to identify and estimate the applicable Xcel Energy rebate incentives. This memo identifies the applicable rebates and provides a summary of the utility cost analysis that has been completed.

In order to measure the energy performance of the new addition and existing retrofits, as well as estimate the Xcel Energy incentive rebates, two energy models have been produced. Both models include the existing building and the new addition. The design case model determines the performance of the existing building with planned retrofit improvements as well as the new addition designed per Design Development drawings. The base case model determines the performance of the existing building without planned improvements as well as the new addition following guidelines to be minimally compliant with ASHRAE Standard 90.1-2004.

The table below shows the summary of the projected annual energy cost and the energy use index for the base case and design case.

SUMMARY	Total Energy Use Index		Annual Utility Costs		
	kBTU/sf/yr	% reduction	\$/yr	% reduction	\$ reduction
Base Case - Existing Building and Base Addition	91.61		\$144,031		
Design Case - Updated Existing Building and Design Addition	73.93	19.3%	\$116,039	19.4%	\$27,992

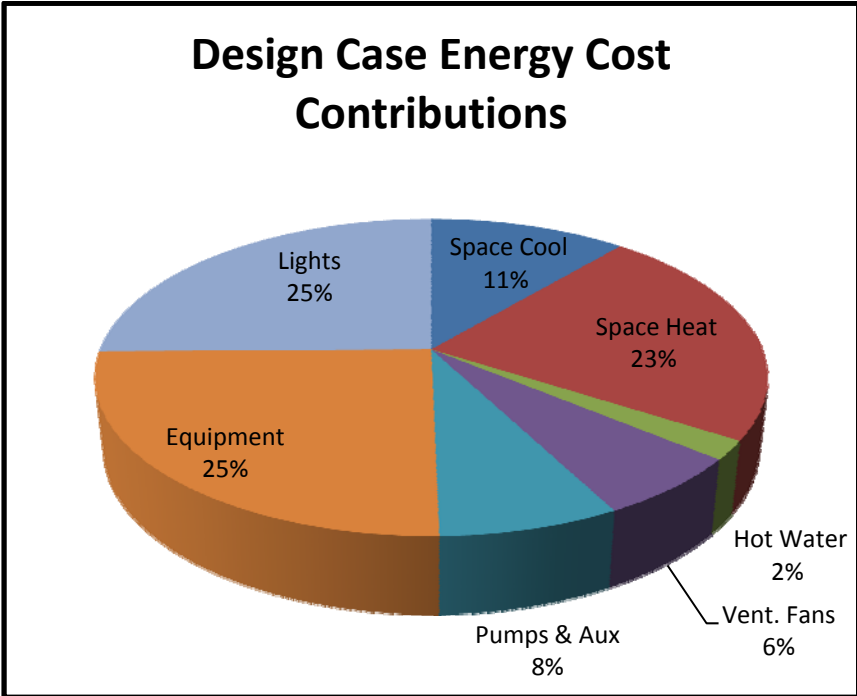
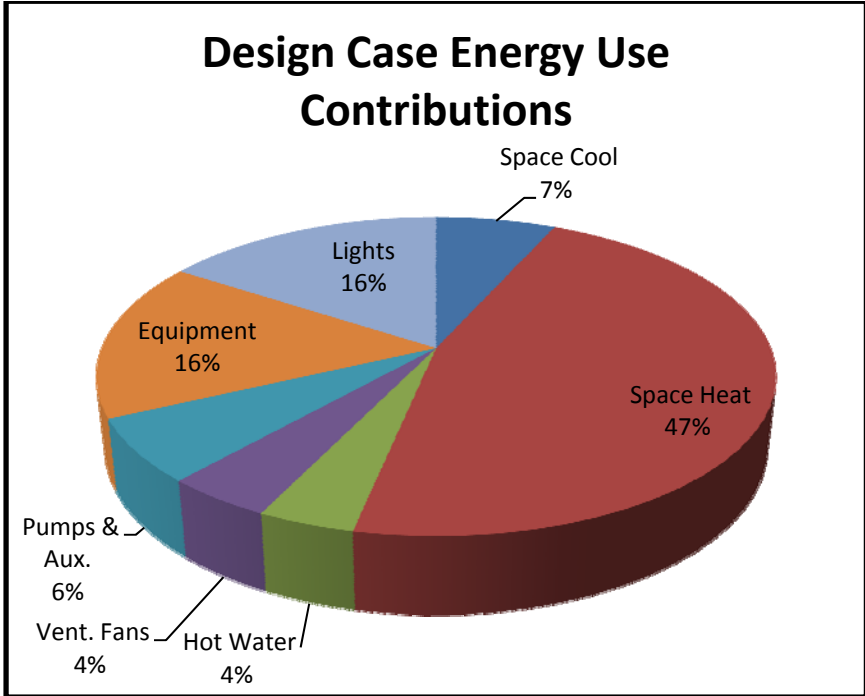
The table following summarizes the overall energy usage broken down by electricity and natural gas for both models.

ENERGY USAGE	Energy Usage Index	% reduction from Design Case	Electric			Natural Gas
	kBtu/sf/yr	%	kWh/yr	total demand kW/mo	peak kW/mo	MMBtu/yr
Base Case - Existing Building and Base Addition	91.6		1,193,200	3,956	399.9	4,921
Design Case - Updated Existing Building and Design Addition	73.9	19.3%	1,054,800	3,113	293.5	3,658

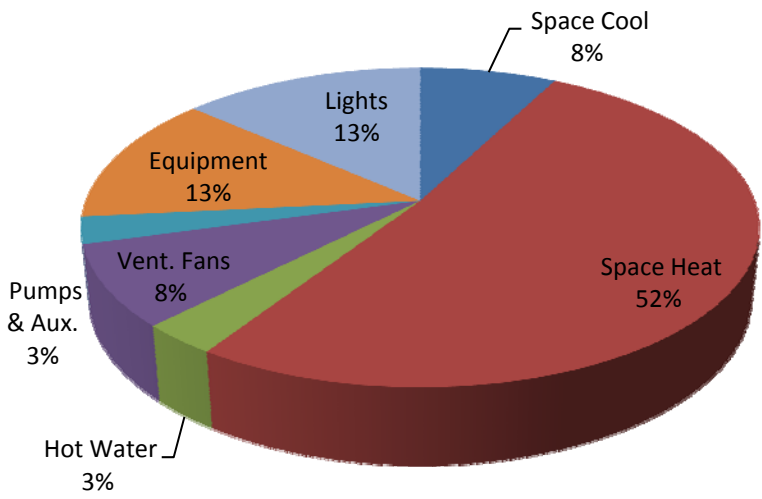
The table below describes the energy cost breakdown for electricity and natural gas for both models.

ENERGY COST	Annual Energy Cost		Electric				Natural Gas		
	Energy Cost Index \$/sf/yr	\$/yr	Total \$	Energy \$	Demand \$	Monthly \$	Total \$	Energy \$	Monthly \$
Base Case - Existing Building and Base Addition	\$1.47	\$144,031	\$105,379	\$44,673	\$60,363	\$343	\$38,652	\$38,384	\$268
Design Case - Updated Existing Building and Design Addition	\$1.18	\$116,039	\$87,240	\$39,492	\$47,405	\$343	\$28,799	\$28,532	\$268

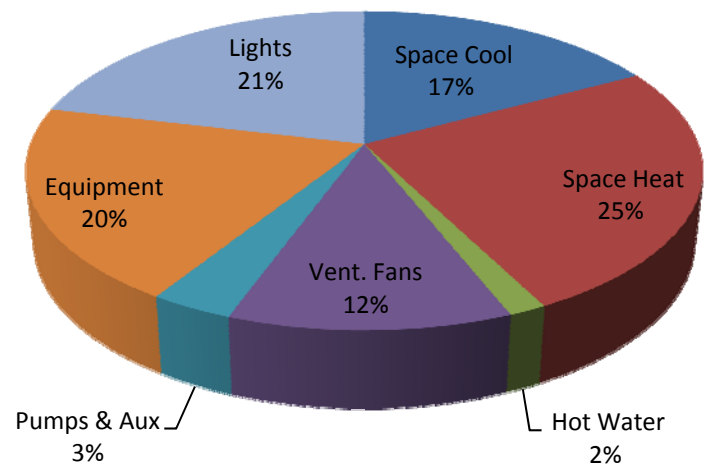
The figures below illustrate the energy use and cost contributions for each model. Notice that spacing heating, equipment, and lighting are the largest contributors to energy use in the building. Therefore, these items are great targets for energy reduction when considering future improvements.



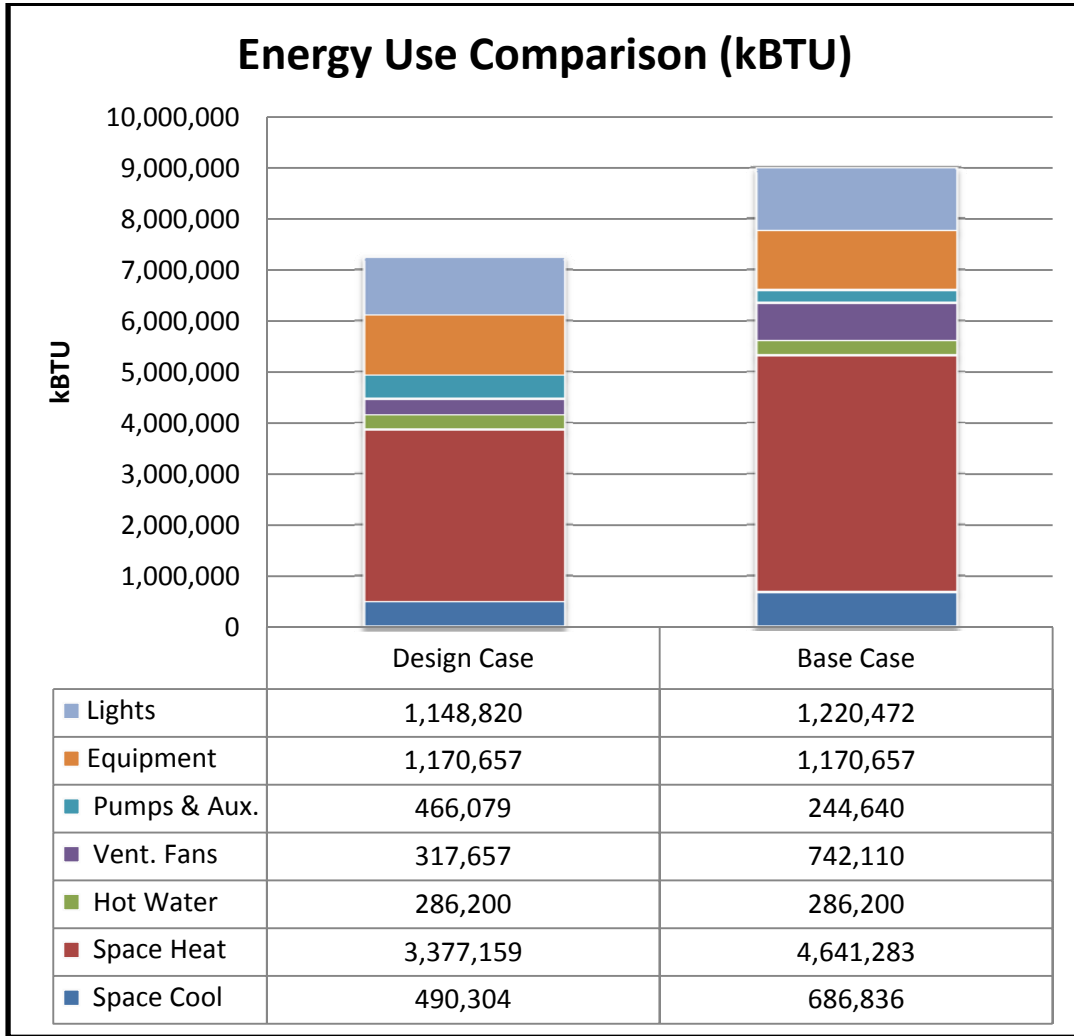
Base Case Energy Use Contributions



Base Case Energy Cost Contributions



The figure below illustrates the comparative energy use contributions for both models.



To add upon the current energy efficient design of this building, the following items are recommended for additional energy efficiency by reducing internal loads and peak demand:

- Replace incandescent lighting fixtures in existing sanctuary and gathering spaces with high efficiency fluorescent fixtures.
- Receptacle on/off switches to eliminate standby power
- Energy Star appliances – maintenance equipment, vending machines, dishwashers, refrigerators, computers, printers, copy machines, fax machines, televisions, and DVD players
- Occupancy control of vending machines
- LED task lighting and under cabinet lighting

Xcel Energy Incentives and Utility Bill Analysis:

The modeling process involved an investigation of the utility expenses for the existing SAUMC facility. The utility bills have been analyzed to identify trends in energy consumption for specific end uses as well as overall energy cost and use. 2007 and 2008 utility bills have been investigated and the summary is included below in Table 1. The utility bills illustrate that overall building energy use was reduced by 8.9 kBTU/sf/yr in 2008, compared to 2007. However, the energy cost in 2008 is greater because utility rates have increased.

2007 and 2008 annual utility bill summary for existing building

	2007	2008
Electric Cost (\$)	\$71,813.41	\$73,568.56
Natural Gas Cost (\$)	\$19,295.21	\$20,725.03
Total (\$)	\$91,108.62	\$94,293.59
\$/sf/yr	\$1.51	\$1.56
kBTU/sf/yr	101.3	92.4

The available utility bill data for 2009 has also been reviewed, and the significant energy cost savings reflected in the bills can be attributed to improved system monitoring and energy saving strategies implemented by the facility manager, Casey Cole. An energy audit was performed by Ambient Energy, which involved documentation of operational details such as occupancy, hours, thermostat schedules, internal loads, the building automation system and HVAC controls. This information has been used to fine tune the energy model used in the analysis.

Estimates of all applicable Xcel Energy rebate incentives have been produced, and the base bid items total to an amount **within the range of \$16,300 - \$21,200**. When including all of the bid alternates, the total estimated rebate increases to \$19,500 – \$25,700 (including the high performance skylight). The base bid or bid alternate designations for each item can be found in the detailed descriptions below. All the rebates are based on Xcel Energy's 2009 rebate program that was initiated on February 15, 2009.

Prescriptive rebates: prescriptive rebates are rebates given for a proven technology and do not require pre-approval from Xcel Energy to qualify. The estimated amount of all applicable prescriptive rebates is in the range of \$15,400 - \$19,400.

1. Lighting Efficiency (Retrofit – Base Bid): This rebate applies to qualifying lamps and fixtures that will replace existing, less-efficient, lamps and fixtures in the existing portion of the building.
 - a. Rebate estimate for project: \$100 - \$500
2. Lighting Efficiency (New Construction – Base Bid): This rebate applies to new energy efficient lamps and fixtures scheduled to be installed in the new addition.
 - a. Rebate estimate for project: \$800 - \$1,200
3. Motor Efficiency (NEMA Premium Motors – Bid Alternate): This rebate applies to any fan or pump motor below 200 HP that will be furnished with a NEMA certified premium efficiency motor
 - a. Rebate estimate for project: \$500 - \$700
4. Motor Efficiency (Drive): Applies to any fan or pump under 200 HP that will be newly furnished with a variable frequency drive (VFD – Base Bid).
 - a. Rebate estimate for project: \$12,000 - \$14,000
5. Cooling Efficiency (Chiller – Base Bid): Applies to new cooling equipment that meets the minimum efficiency requirements.
 - a. Rebate estimate for project: \$2,000 - \$3,000

- b. *Note this rebate estimate is for the new electric screw chiller and will only qualify if the scheduled efficiency of the chiller is improved by 0.01 kW/ton (the minimum chiller efficiency to qualify is 0.64 kW/ton)*

Custom rebates: custom efficiency rebates involve any energy saving measure that cannot be applied for through a prescriptive rebate program. Custom efficiency rebates do require pre-approval from Xcel Energy in order to qualify. Pre-approval applications for each custom efficiency rebate should be submitted to Xcel Energy in a timely manner as soon as the measure can be confirmed that it will not likely change. Custom efficiency rebates can pay up to \$400 for each kW of peak summer electric demand, where summer is defined as the months of June through September. A similar custom natural gas efficiency rebate pays up to \$7 for each Decatherm (MMBTU) of annual natural gas energy saved as a result from the measure. The estimated amount of all applicable custom rebates is in the range of \$2,500 - \$4,300.

1. Custom Electric Efficiency (High Performance Glazing – Bid Alternate): Applicable to high performance glazing assemblies that can be shown to reduce the peak summer electric demand of the building (kW), relative to a minimally code compliant product that would have otherwise been installed.
 - a. *Rebate estimate for project: \$500 - \$1,000*
2. Custom Electric Efficiency (High Performance Walls – Base Bid): Applicable to high performance wall assemblies that can be shown to reduce the peak summer electric demand of the building (kW), relative to a minimally code compliant product that would have otherwise been installed.
 - a. *Rebate estimate for project: \$200 - \$300*
3. Custom Electric Efficiency (High Performance Roof – Base Bid): Applicable to high performance roof assemblies that can be shown to reduce the peak summer electric demand of the building (kW), relative to a minimally code compliant product that would have otherwise been installed.
 - a. *Rebate estimate for project: \$600 - \$1,100*
4. Custom Gas Efficiency (High Performance Glazing – Bid Alternate): Applicable to high performance glazing assemblies that can be shown to reduce the annual gas consumption (Decatherms) of the building, relative to a minimally code compliant product that would have otherwise been installed.
 - a. *Rebate estimate for project: \$600 - \$800*
5. Custom Gas Efficiency (High Performance Walls – Base Bid): Applicable to high performance wall assemblies that can be shown to reduce the annual gas consumption (Decatherms) of the building, relative to a minimally code compliant product that would have otherwise been installed.
 - a. *Rebate estimate for project: \$300 - \$400*
6. Custom Gas Efficiency (High Performance Roof – Base Bid): Applicable to high performance roof assemblies that can be shown to reduce the annual gas consumption (Decatherms) of the building, relative to a minimally code compliant product that would have otherwise been installed.
 - a. *Rebate estimate for project: \$600 - \$700*

There is an additional custom rebate possibility for the high performance skylight bid alternate (If the project chooses to install the Serious Glass 14 Sunshade Product – U-0.07). The estimated rebate from the installation of this high performance skylight is \$800 - \$1,000 via the custom electricity program, and \$800 - \$1,000 via the custom natural gas program.

The next step in order to ensure these rebates can be collected is to complete the Xcel Energy incentive documentation and apply for pre-approval for all applicable custom efficiency rebates. It is recommended to do this after the final design decisions have been made for each specific product (that impacts energy). If pre-approval is granted for a specific product (i.e. glazing, insulation type, etc...) and then the product is changed or altered afterwards, the pre-approval then becomes void and another application will be required.

Appendix:

Part 1: Model input parameters

Part 2: Energy simulation outputs for base case and design case energy models

Features Common to All Models:

Model Input Parameter	Proposed Design Input
Building Address	3350 White Bay Drive, Highlands Ranch, CO 80126
Size	60,408 gross sf existing / 29,500 gross sf new construction / 17,500 sf unfinished new construction
Hours of Operation	8 AM - 8 PM Mon-Sun
Occupants	Sanctuary: Sunday occupancy 1st service (8:00AM) - 300 max occupants 2nd service (9:30AM) - 800 max occupants 3rd service (11:00AM) - 600 max occupants Occupied partially for 8 hours (total) for the rest of the week Remaining portion of the building: 7 days a week, 8 AM to 8 PM, 700 peak occupants Light occupancy on Saturday
Utility Rates	Xcel Energy Secondary General Electric Consumption: \$0.03744 / kWh Electric Demand: \$14.73 / kW winter (Oct. 1 through May 31) \$16.08 / kW summer (June 1 through Sept 30) Xcel Energy Commercial General Natural Gas: \$8.72 / MMBtu (based on historic average)
Setpoint Temperatures	Heating: 69 F setpoint; 68 F unoccupied Cooling: 71 F setpoint; 72 F unoccupied
Design Conditions	Summer: 93 F DB / 60 F WB Winter: -3 F DB
ASHRAE Design Conditions	Climate Zone 5B Summer: 90 F DB / 59 F WB (1% cooling design temp) Winter: -3 F DB (99.6% heating design temp)
Weather	TMY3 Denver/Centennial

Summary of Model Input Parameters:

Model Input Parameter	Proposed Design Input: New Construction and Renovation to Existing Building	Baseline Design Input: Existing Building As-Is, and New Construction per ASHRAE 90.1-2004 with Addenda A Climate Zone 5B
Architectural Inputs		
Exterior Wall Construction	<p>New construction: 8" CMU on exterior sheathing on 1" rigid polyiso on 8" steel studs w/ R-11 batt on gyp board (Assembly R-17.0 / U-0.059)</p> <p>New below-grade construction: 12" concrete foundation on 3 5/8" steel studs w/ R-9 batt on gyp board (Assembly C-0.133)</p> <p>Existing building construction: 8" CMU on exterior sheathing on 3 5/8" studs w/ R-11 batt on gyp board (Assembly R-11.0 / U-0.091)</p>	<p>New construction: Steel-framed wall R-13 + R-3.8 c.i. (Assembly U-0.084)</p> <p>Below-grade wall: uninsulated (Assembly C-1.14)</p> <p>Existing building construction: same existing construction</p>
Roof Construction	<p>New construction - Sanctuary: 4.5" rigid polyiso on metal decking (Assembly R-30 / U-0.033) Roof Reflectivity: 30%</p> <p>New construction - Flex Space: Tapered rigid polyiso from 1" thick at minimum with R-30 batt to 13" thick at maximum (Assembly R-40 / U-0.025) Roof Reflectivity: 30%</p> <p>Existing Building: 4.5" rigid polyiso on metal decking (Assembly R-30 / U-0.033) Roof Reflectivity: 30%</p>	<p>New Construction: R-15 c.i. entirely above deck (Assembly U-0.063) Roof reflectivity: 30% per Appendix G</p> <p>Existing building construction: same existing construction</p>
Floor/Slab Construction	<p>New Construction: 2" rigid EPS extended 4' vertically around perimeter (Assembly F-0.48)</p> <p>Existing Building: No perimeter insulation</p>	<p>New Construction: Slab-on-grade (unheated): no perimeter insulation (Assembly F-0.73)</p> <p>Existing Building: No perimeter insulation</p>
Window-to-gross wall ratio	As Designed	same as design

Model Input Parameter	Proposed Design Input: New Construction and Renovation to Existing Building	Baseline Design Input: Existing Building As-Is, and New Construction per ASHRAE 90.1-2004 with Addenda A Climate Zone 5B
Fenestration type	Vertical glazing: PPG 1" insulated Optigray 23 w/ Solarban 60 Skylight: PPG 1" Starphire 70XL	New Construction: Fixed Existing: Current construction
Fenestration U-factor	Vertical: U-0.29, R-3.4 Skylight: U-0.29, R-3.4	New Construction: Vertical: U-0.57 Skylight: U-1.17 Existing: Current construction
Fenestration SHGC	Vertical: SHGC-0.19, SC-0.22 Skylight: SHGC-0.27, SC-0.32	New Construction: Vertical: SHGC-0.39, SC-0.45 Skylight: SHGC-0.49, SC-0.57 Existing: Current construction
Fenestration Visual Light Transmittance	Vertical: Tvis-0.18 Skylight: Tvis0.64	New Construction: Vertical: Tvis-0.50 Skylight: Tvis-0.50 Existing: Current construction
Shading Devices	As Designed	New Construction: No shading devices Existing: Current construction
Electrical Inputs		
Interior Lighting Power Density (W/sf)	Total interior lighting power: 139.5 kW Space-by-space: Existing Sanctuary: 2.5 W/sf Existing Gathering Space: 2.3 W/sf Existing Corridors: 1.0 W/sf Existing Classrooms: 1.5 W/sf Existing Offices: 1.7 W/sf	Total interior lighting power: 151.1 kW Building Area Method: Religious Building 1.3 W/sf Space-by-space: Audience Seating 1.7 W/sf Fellowship Hall 0.9 W/sf Worship Pulpit, Choir 2.4 W/sf Lobby 1.3 W/sf Admin 1.1 W/sf Office 1.1 W/sf Conference / Meeting / Multipurpose 1.3 Classroom 1.4 Restroom 0.9 W/sf Corridor 0.5 W/sf Stairs: 0.6 W/sf Storage 0.3 W/sf Mechanical/Electrical 1.5 W/sf Existing Lighting: same as design
Daylighting Controls	NA	NA

Model Input Parameter	Proposed Design Input: New Construction and Renovation to Existing Building	Baseline Design Input: Existing Building As-Is, and New Construction per ASHRAE 90.1-2004 with Addenda A Climate Zone 5B
Other Lighting Controls	Occupancy sensor retrofit for classroom spaces in existing building	NA
Exterior Lighting Power (kW)	6.33 kW	6.33 kW
Process Lighting (kW)	NA	NA
Receptacle Equipment Power Density (W/sf)	Total misc. equipment load: 106.9 kW	same as design
Process Equipment Power: Elevator	25 kW elevator	same as design
<i>Mechanical Inputs</i>		
Primary HVAC System Type	<p>New Construction - Sanctuary: Underfloor Air Distribution system, VAV, with HW and CHW coils</p> <p>New Construction - Flex Space: Overhead VAV system, with HW and CHW coils</p> <p>Existing Building - Main: Overhead VAV system with HW and CHW coils</p> <p>Existing Building - Sanctuary: CV system with HW reheat and CHW coils</p>	Area > 75,000 sf System 5: Packaged rooftop VAV w/reheat, DX cooling, and hot water fossil fuel boiler heating
Other HVAC System Type	<p>New Construction: Split system fan coil unit FCU-1, and finned tube radiator FR-1</p> <p>Existing Building: Hot water unit heaters, hot water fintube radiator, and electric radiant heating panel</p>	same as design
Fan Supply Volume (cfm)	<p>New Construction: AHU-1 supply/return: 42,000 cfm AHU-2 supply/return: 23,500 cfm</p> <p>Existing Building: RTU-1 supply/return: 47,000 cfm RTU-2 supply/return: 20,000 cfm</p>	<p>Auto sized with 20 F difference between supply air and room air temperature.</p> <p>VAV Minimum flow setpoint: 0.4 cfm/sf</p>

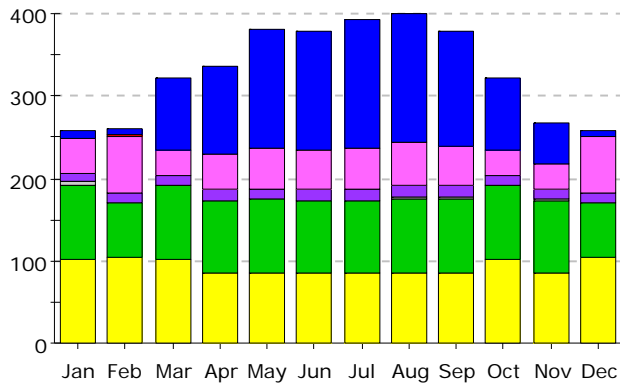
Model Input Parameter	Proposed Design Input: New Construction and Renovation to Existing Building	Baseline Design Input: Existing Building As-Is, and New Construction per ASHRAE 90.1-2004 with Addenda A Climate Zone 5B
Fan Power (kW)	<p>New Construction: AHU-1 supply: 2.69" TSP, 30 HP AHU-1 return: 1.63" TSP, 25 HP AHU-2 supply: 3.79" TSP, 30 HP AHU-2 return: 1.63" TSP, 20 HP</p> <p>Existing Building: RTU-1 supply: 3.5" TSP, 50 HP RTU-1 return: 1.5" TSP, 40 HP RTU-2 supply: 3.5" TSP, 25 HP RTU-2 return: 2.0" TSP, 15 HP</p>	same as design
Ventilation/Exhaust	<p>New Construction: AHU-1: 17% Min OA, 7,200 cfm AHU-2: 30% Min OA, 7,100 cfm (Total Interlocked Exhaust: 975 cfm)</p> <p>Existing Building: RTU-1 48% Min OA, 22,900 cfm RTU-2 28% Min OA, 5,700 cfm (Total Interlocked Exhaust: 4,100 cfm)</p>	same as design
Economizer Control	65 F dry bulb high limit	65 F dry bulb high limit
Demand Control Ventilation	CO2 sensors in return ducts of all units	CO2 sensors in return ducts of RTU-1 and RTU-2, and in spaces where required
Unitary Equipment Cooling Efficiency	DX systems: 1.3 kW/ton = 0.3697 EIR	EER per ASHRAE 90.1
Unitary Equipment Heating Efficiency	NA	NA
Heating system parameters	(2) Existing Boilers will provide heat for new systems: Lochinvar Copper Tube - 83% thermal efficiency	2 equally sized boilers, 80% efficient 180 F hot water supply and 130 F return
Hot water loop and pump parameters	<p>HW boiler pumps: (2) 200 gpm, 25 ft head, 2 HP, CV HW distribution pumps: (2) 100 gpm, 75 ft head, 5 HP, VFDs</p> <p>160 F supply, 120 F return (design) Hot water supply temperature reset: 160@0 and below, 140@60 and above</p>	<p>Hot water supply reset: 180@20 and below, 150@50 and above Pumps: autosized 19W/gpm, riding the pump curve</p>
Chiller Parameters	<p>New Chiller: 220 tons, 0.65 kW/ton, 0.1907 EIR</p> <p>Existing Chiller: 160 tons, 0.64 kW/ton, 0.1877 EIR</p>	NA

Model Input Parameter	Proposed Design Input: New Construction and Renovation to Existing Building	Baseline Design Input: Existing Building As-Is, and New Construction per ASHRAE 90.1-2004 with Addenda A Climate Zone 5B
Chilled water loop and pump parameters	CHW Pump: 550 gpm, 90 ft head, 25 HP 45 F supply, 57 F return	NA
Cooling tower parameters	Variable Speed Fan 90 F entering temp, 75 F leaving temp	NA
Condenser water loop and pump parameters	CW Pump: 420 gpm, 110 ft head, 20 HP	Existing CW Pump: 310 gpm, 26 ft head, 3 HP
Service Hot Water	Gas-fired water heater: 100 gallon tank 140 F supply, 40 F inlet Thermal efficiency: 80%	same as design

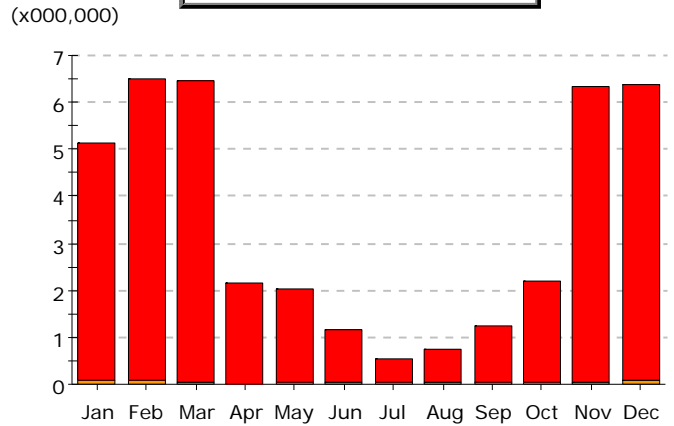
Modeling Results Output:

The following pages are some output summaries generated with the energy modeling software. The first two pages describe the peak demand and overall energy use profiles for the base case. The third and fourth pages describe the peak demand and overall energy use profiles for the design case.

Electric Demand (kW)



Gas Demand (Btu/h)



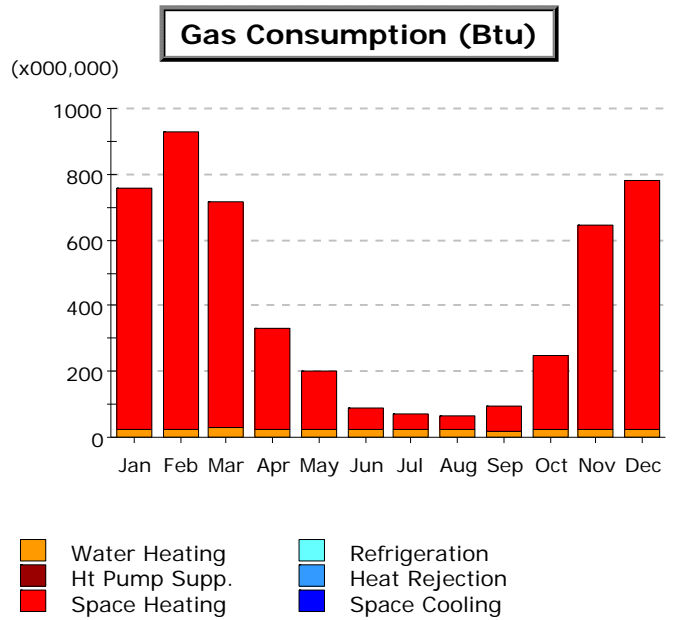
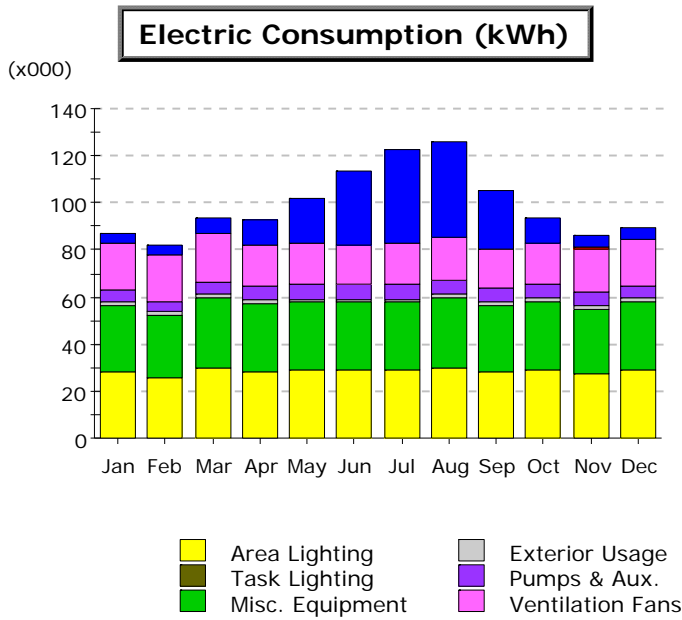
- Area Lighting
- Exterior Usage
- Water Heating
- Refrigeration
- Task Lighting
- Pumps & Aux.
- Ht Pump Supp.
- Heat Rejection
- Misc. Equipment
- Ventilation Fans
- Space Heating
- Space Cooling

Electric Demand (kW)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	11.1	5.9	88.9	107.4	143.3	144.4	155.5	156.4	137.7	88.5	50.1	7.4	1,096.7
Heat Reject.	-	-	0.2	0.2	0.5	0.4	0.5	0.6	0.4	0.0	-	-	2.8
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.5	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	4.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	40.7	68.7	30.2	42.8	48.5	48.4	50.0	52.0	48.9	30.0	30.2	68.1	558.8
Pumps & Aux.	10.1	10.7	12.6	12.7	12.8	12.8	12.8	12.8	12.8	12.6	12.4	10.6	145.7
Ext. Usage	4.0	-	-	-	-	-	-	3.0	3.0	0.8	1.5	-	12.3
Misc. Equip.	89.8	67.1	88.0	87.4	89.3	87.4	87.4	89.3	89.3	88.0	87.4	67.1	1,017.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	102.8	104.5	102.8	85.7	85.7	85.7	85.7	85.7	85.7	102.8	85.7	104.5	1,117.6
Total	259.1	259.5	322.8	336.3	380.2	379.2	392.0	399.9	377.8	322.8	267.4	259.0	3,956.2

Gas Demand (Btu/h x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	5.02	6.41	6.41	2.12	1.96	1.12	0.51	0.70	1.19	2.16	6.31	6.27	40.19
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.10	0.08	0.04	0.02	0.06	0.03	0.05	0.02	0.05	0.05	0.03	0.10	0.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	5.12	6.49	6.45	2.14	2.02	1.15	0.56	0.73	1.24	2.21	6.34	6.37	40.82



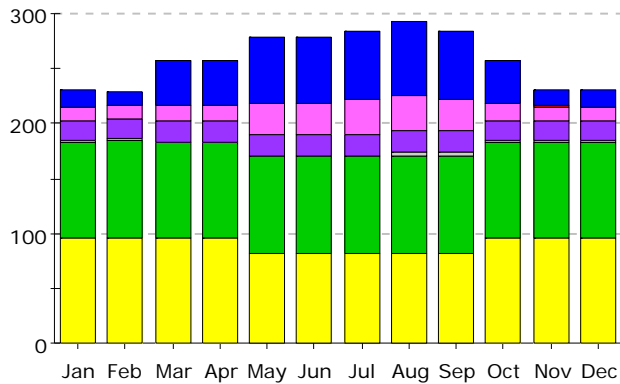
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	4.5	3.8	6.7	10.5	18.9	31.5	39.2	40.7	24.9	10.2	5.5	4.7	201.1
Heat Reject.	-	-	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	-	-	0.2
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	1.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	19.2	19.4	20.0	17.1	17.4	16.5	17.8	17.9	16.7	17.4	18.8	19.5	217.5
Pumps & Aux.	5.4	4.8	5.6	6.3	6.6	6.4	6.6	6.5	6.3	6.4	5.5	5.4	71.7
Ext. Usage	1.6	1.2	1.4	1.3	0.9	0.9	0.9	1.5	1.5	1.5	1.5	1.6	15.9
Misc. Equip.	28.4	26.1	29.6	28.9	29.1	28.6	29.1	29.6	28.1	29.1	27.1	29.1	343.1
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.0	26.1	30.0	28.4	28.6	29.2	28.6	29.7	28.0	28.6	27.7	28.9	341.8
Total	87.3	81.7	93.6	92.6	101.7	113.3	122.3	126.0	105.6	93.4	86.3	89.5	1,193.2

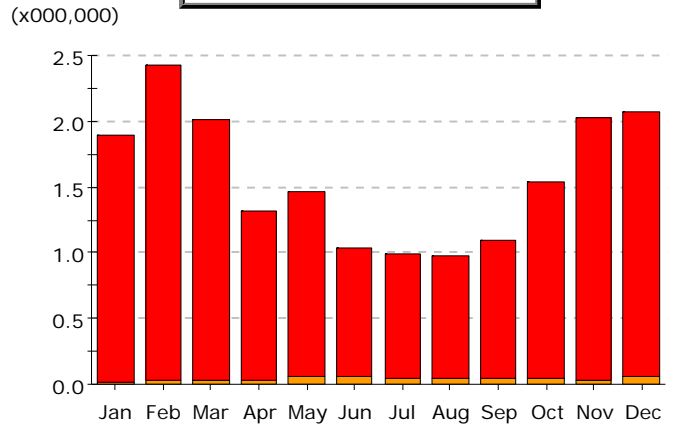
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	731.0	905.8	687.3	303.2	174.2	66.6	49.3	40.5	71.1	225.8	620.9	758.9	4,634.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	25.6	24.5	28.1	26.3	25.0	23.6	22.0	21.7	20.6	21.8	22.3	24.9	286.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	756.6	930.2	715.3	329.5	199.2	90.3	71.3	62.3	91.7	247.6	643.2	783.8	4,921.0

Electric Demand (kW)



Gas Demand (Btu/h)



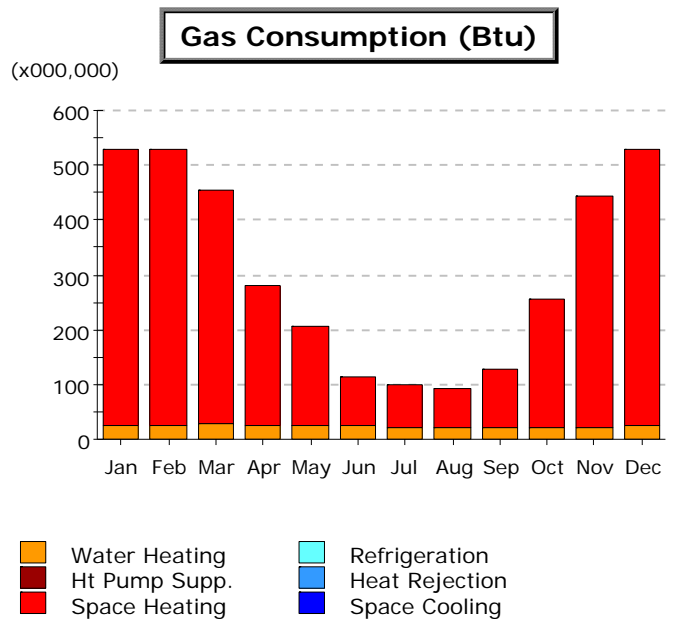
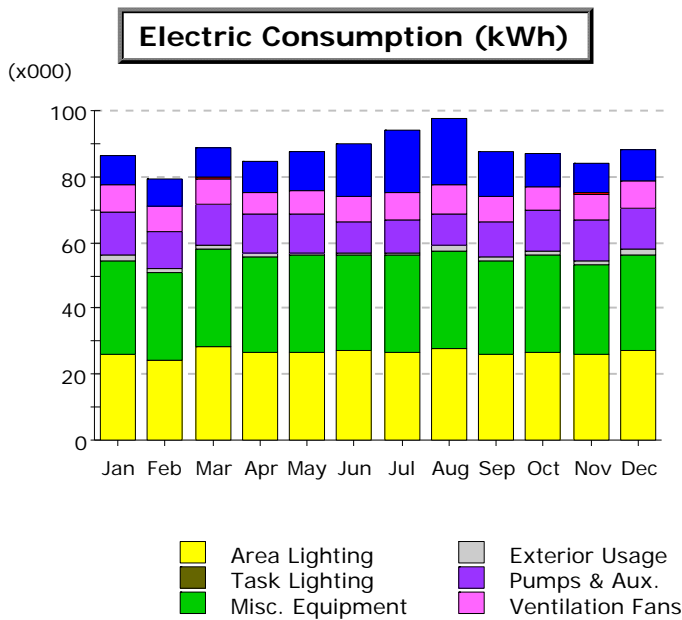
- Area Lighting
- Task Lighting
- Pumps & Aux.
- Ventilation Fans
- Water Heating
- Ht Pump Supp.
- Refrigeration
- Heat Rejection
- Space Heating
- Space Cooling

Electric Demand (kW)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	15.2	13.4	39.8	39.5	59.9	60.4	62.5	67.2	62.0	39.1	15.4	15.4	489.6
Heat Reject.	-	-	-	-	-	-	-	0.2	-	-	-	-	0.2
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	12.0	11.7	14.7	14.8	28.7	29.2	31.6	33.0	29.8	15.4	12.4	12.2	245.6
Pumps & Aux.	18.3	17.7	18.9	18.9	19.1	19.1	19.1	19.2	19.1	18.8	18.3	18.3	224.9
Ext. Usage	1.5	1.3	-	-	-	-	-	3.0	3.0	0.8	1.5	1.5	12.5
Misc. Equip.	88.0	89.8	88.0	88.0	89.3	89.3	89.3	89.3	89.3	88.0	88.0	88.0	1,064.2
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	95.4	95.4	95.4	95.4	81.5	81.5	81.5	81.5	81.5	95.4	95.4	95.4	1,075.3
Total	230.6	229.6	256.7	256.6	278.5	279.5	284.1	293.5	284.8	257.6	231.2	230.9	3,113.4

Gas Demand (Btu/h x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.88	2.39	1.98	1.28	1.41	0.98	0.94	0.93	1.04	1.49	2.00	2.02	18.33
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.01	0.03	0.03	0.03	0.06	0.06	0.05	0.05	0.05	0.05	0.03	0.06	0.50
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.89	2.42	2.01	1.31	1.47	1.03	0.99	0.98	1.09	1.54	2.02	2.08	18.83



- Area Lighting
- Task Lighting
- Misc. Equipment
- Exterior Usage
- Pumps & Aux.
- Ventilation Fans
- Water Heating
- Ht Pump Supp.
- Space Heating
- Refrigeration
- Heat Rejection
- Space Cooling

Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	9.0	8.1	9.4	9.4	12.0	15.8	18.8	19.7	14.0	9.7	8.9	8.9	143.7
Heat Reject.	-	-	-	-	-	0.0	0.0	0.0	-	-	-	-	0.0
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	1.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	8.3	7.7	7.8	6.8	7.1	7.5	8.5	8.9	7.4	7.2	7.7	8.2	93.1
Pumps & Aux.	12.7	11.5	12.6	11.6	11.5	9.5	9.8	9.7	10.4	12.2	12.3	12.7	136.6
Ext. Usage	1.6	1.2	1.4	1.3	0.9	0.9	0.9	1.5	1.5	1.5	1.5	1.6	15.9
Misc. Equip.	28.4	26.1	29.6	28.9	29.1	28.6	29.1	29.6	28.1	29.1	27.1	29.1	343.1
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.3	24.5	28.1	26.6	26.9	27.4	26.9	27.9	26.3	26.9	26.0	27.1	320.8
Total	86.4	79.4	89.0	84.8	87.6	89.8	94.2	97.4	87.7	86.8	83.8	87.9	1,054.8

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	502.8	505.6	427.5	254.2	182.3	88.3	75.8	69.4	108.6	233.5	421.2	502.5	3,371.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	25.6	24.5	28.1	26.3	25.0	23.6	22.0	21.7	20.6	21.8	22.3	24.9	286.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	528.4	530.1	455.5	280.5	207.2	111.9	97.7	91.2	129.2	255.2	443.5	527.4	3,657.9