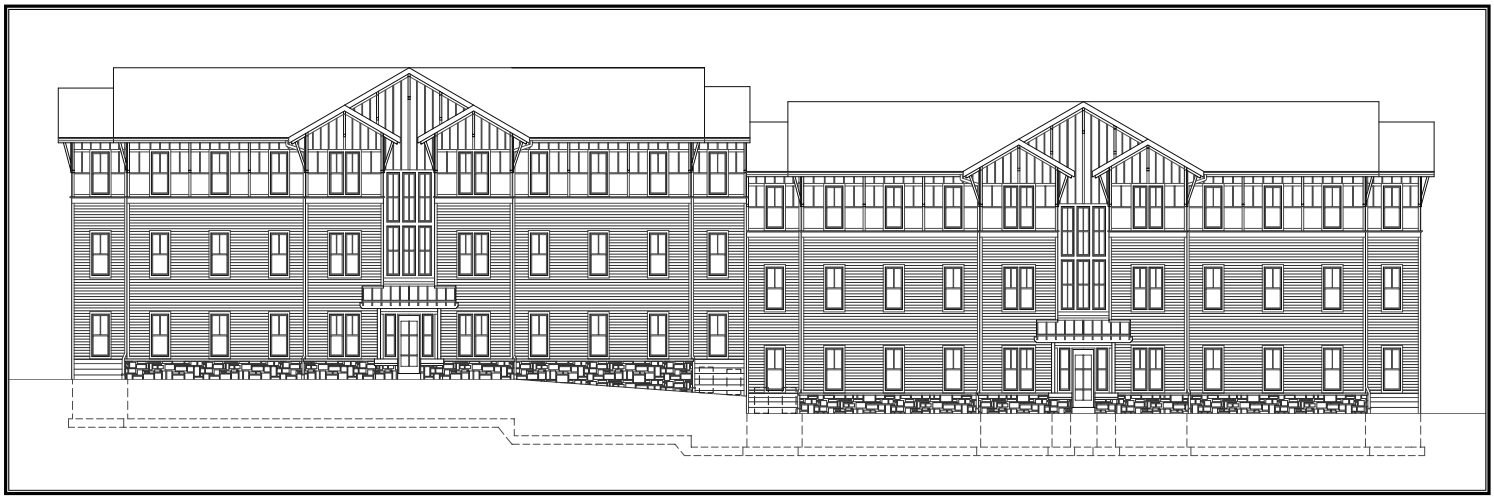
BUILDING AND PLANT ENERGY ANALYSIS REPORT



UNIVERSITY RIDGE
AT EAST STROUDSBURG UNIVERSITY
EAST STROUDSBURG, PA

PREPARED FOR:
JAE-WEON JEONG, PH.D.

BY:
MATTHEW CARR
MECHANICAL OPTION
OCTOBER 27, 2006

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Executive Summary

This report is intended to analyze the building and plant energy for the University Ridge student housing complex at East Stroudsburg. The building is analyzed using ASHRAE's Standard 90.1-2004 Energy Standard and the LEED-NC Green Building Rating System. These two guides analyze the energy use and compliance for green and sustainable buildings. This report also looks at the impact of mechanical space which results in a loss of rentable space and the mechanical system first cost. Moreover, an energy and design load estimates were calculated using Trace 700 which is a readily used design and analysis program used by designers. Energy consumption and cost data using utility rates associated with the mechanical system were also determined using this program.

The degree of University Ridge's compliance for energy efficient design was demonstrated using ASHRAE Standard 90.1. This guide is the latest update and most acceptable design standard for energy efficient design. The buildings envelope, HVAC system, service water heating, and lighting were all analyzed to determine its degree of compliance.

The LEED Green Building Rating System was used to measure its degree of sustainability and environmentally friendliness. The system consists of 6 categories in which points can be earned towards a certification. For the intents and purposes of this report, only the topics concerning mechanical systems were analyzed.

The mechanical spaces comprise only 2% of lost rentable space of the buildings gross square footage. The first cost of the mechanical systems came in at $3.4 million dollars or about 21.6% of the buildings total cost.

TRANE TRACE 700 was used to calculate the design load for the spaces using design conditions from the design documents. From these design calculations, energy and utility cost information was obtained. Utility rates were based on an actual utility bill from June of 2006.

ASHRAE Standard 90.1 Compliance

Building Envelope – Section 5

In determining the buildings envelope compliance, sections 5.1, 5.4, 5.5, 5.7, and 5.8 of Standard 90.1 must be met in order for the building to be considered acceptable. It is assumed that the buildings pass sections 5.1, 5.4, 5.7, and 5.8 as they cannot be verified with given information.

5.5 Prescriptive Path

Given the location and occupancy of the buildings, the envelope must comply with the non-residential section of Climate Zone 5A. These requirements are stated in table 5.5-5 of Standard 90.1 as follows:

TABLE 5.5-5
Building Envelope Requirements For Climate Zone 5 (A,B,C)

		Residential
Opaque Elements	**Assembly Maximum**	**Insulation Min. R-Value**
Roofs		
Insulation Entirely above Deck	U-0.063	R-15.0 ci
Metal Building	U-0.065	R-19.0
Attic and Other	U-0.027	R-38.0
Walls, Above Grade		
Mass	U-0.090	R-11.4 ci
Metal Building	U-0.057	R-13.0 + R-13.0
Steel Framed	U-0.064	R-13.0 + R-7.5 ci
Wood Framed and Other	U-0.089	R-13.0
Wall, Below Grade		
Below Grade Wall	C-1.140	NR
Floors		
Mass	U-0.074	R-10.4 ci
Steel Joist	U-0.038	R-30.0
Wood Framed and Other	U-0.033	R-30.0
Slab-On-Grade Floors		
Unheated	F-0.730	NR
Heated	F-0.840	R-10 for 36 in.
Opaque Doors		
Swinging	U-0.700	
Non-Swinging	U-0.500	
Fenestration	**Assembly Max. U (Fixed/ Operable)**	**Assembly Max. SHGC (All Orientations/ North-Oriented)**

Vertical Glazing,% of Wall		
0-10.0%	U_{fixed}-0.57	$SHGC_{all}$-0.49
	U_{oper} -0.67	$SHGC_{north}$-0.49
10.1-20.0%	U_{fixed}-0.57	$SHGC_{all}$-0.39
	U_{oper} -0.67	$SHGC_{north}$-0.49
20.1-30.0%	U_{fixed}-0.57	$SHGC_{all}$-0.39
	U_{oper} -0.67	$SHGC_{north}$-0.49
30.1-40.0%	U_{fixed}-0.57	$SHGC_{all}$-0.39
	U_{oper} -0.67	$SHGC_{north}$-0.49
40.1-50.0%	U_{fixed}-0.46	$SHGC_{all}$-0.26
	U_{oper} -0.47	$SHGC_{north}$-0.49
Skylight with Curb, Glass,% of Roof		
0-2.0%	U_{all}-1.17	$SHGC_{all}$-0.49
2.1-5.0%	U_{all}-1.17	$SHGC_{all}$-0.39
Skylight with Curb, Plastic,% of Roof		
0-2.0%	U_{all}-1.10	$SHGC_{all}$-0.77
2.1-5.0%	U_{all}-1.10	$SHGC_{all}$-0.62
Skylight without Curb, All,% of Roof		
0-2.0%	U_{all}-0.69	$SHGC_{all}$-0.49
2.1-5.0%	U_{all}-0.69	$SHGC_{all}$-0.39

Opaque Elements

Roofs

The buildings utilize an attic system with R-30 insulation. This R-value does not meet the required value for residential construction. However, this value does meet the required value for non-residential construction. The overall assembly U value does not meet 90.1 with a value of 0.030, as seen in Appendix A, compared to a required value of 0.027. Moreover, the assembly U-factor will not meet because of this shortfall in insulation. A value of 0.0355 was calculated and does not meet the required value of 0.027.

Walls, Above Grade

For assemblies listed on the design documents, exterior walls above grade call for 2x6 wood construction with R-13 insulation and an assembly U-Value of 0.086 as calculated in Appendix A. These values exceed the maximum and minimum thus beating the standard.

Walls, Below Grade

Below grade walls need to meet a maximum assembly factor of C-1.14. The below grade 10” concrete walls with 1.5” insulation at an R-value of 7.5 have a C-value of 0.147 found in Table A4.2 in Appendix A

of Standard 90.1 thus meeting Standard 90.1. No required minimum R-value of insulation is needed.

Slab-On-Grade Floors
For an unheated slab-on-grade floor, no maximum required R-value of insulation is needed. An F-value of 0.7 for 4" concrete floors with R-10 24" horizontal insulation can be found in Table A6.3 in Appendix A of 90.1 which meets the maximum of 0.730.

Opaque Doors
The buildings do not utilize opaque doors for entry ways.

Fenestration

Vertical Glazing % of Wall

It was determined from the architectural design elevations that the window to wall area ratio falls between 10-20%. Therefore, the maximum U-value for operable windows is 0.67 and inoperable windows requiring a value of 0.57. The manufacturer's data that has been provided beats both of these values with a U-value of 0.49, thus beating both of the requirements, see Appendix A. The Solar Heat Gain Coefficient, SHGC, for the windows used has a value of 0.65 which does not meet the required SHGC of 0.39 for all orientations or 0.49 for north orientations. All of the above values were obtained from Silver Line Windows.

Heating, Ventilating, and Air Conditioning – Section 6

After reviewing the requirements as stated in Standard 90.1 Section 6.3.2 Criteria, it is found that the mechanical system meets the standards stated in that section. The air conditionings condensing unit meets the standard as stated in Table 6.8.1A for a split system under 65,000 Btu/h having a Seasonal Energy Efficiency Rating (SEER) of 10.0 where 10.0 is the minimum for being installed before 1/23/06. Given the size of the systems for climate zone 5A, 30.7-70.1 MBH, an economizer is not required per Table 6.5.1.

The duct furnaces that supply conditioned air to spaces are supplied with hot water from exclusive water heaters and shall be considered as gas fired boilers. Therefore, at an input of 65,000 Btu/h, an AFUE of 80% is required for a minimum efficiency. However, the water heaters

supplied do not have an AFUE rating since they run year round and cannot be compared to the table.

The duct furnace fans meet the required horse power values of Table 6.5.3.1 since the duct furnace fans are 1 hp or below and range from 1225-1700 cfm. The maximum allowable motor power is 1.2 hp/1000 cfm. Duct located in the ceiling can be considered indirectly conditioned spaces and do not require insulation per Table 6.8.2B. However, it is stated that in the specifications under section 15081 that supply ducts are rigid fiber board and have an R-value of 4.3, thus meeting 90.1.

It is assumed that all other sections of 6.3.2 Criteria are satisfied in the design documents and by commissioning.

Service Water Heating – Section 7

A single type of gas storage water heater is utilized for service water heating throughout the buildings at a capacity of 65,000 Btu/h and 50 gallons. This rating puts it in the category of 0.62-0.0019V EF for Required Performance according to Table 7.8 of Standard 90.1. The listed Energy Factor (EF) from design data is 0.58 thus meeting the required value in the Standard.

Lighting – Section 9

Interior Space Lighting

The lighting section of ASHRAE Standard 90.1 deals with the maximum allowable power density per floor area for a building. I utilized the building area method to yield the following results for a dormitory.

Building Area Method

Building Type:	Dormitory
Allowed Lighting Power Density:	1.0 W/ft^2
Gross Lighted Floor Area:	140,000 ft^2
Total Lighting Power:	64,956 W

Actual Lighting Power Density: 0.464 W/ft^2

The design of the building used compact fluorescents and regular fluorescence for all spaces, thus yielding a very low power density and increased energy savings both through power use and decreased load to internal spaces.

Conclusion

In conclusion, most of the service elements meet or exceed the requirements for ASHRAE Standard 90.1. The only areas that are lacking are the use of R-30 insulation in the attic and the solar heat gain coefficient of the windows. The R-30 insulation, which is located in the attic, can be argued that it is an unoccupied space and can therefore be considered for a non-residential application and would then pass. The SHGC is high for the windows because it is clear glass. If a tinted glass or low emittance glass was used, the windows would beat the SHGC.

Lost Rentable Space Comparison

The designers took into consideration the fact that lost rentable space due to the mechanical systems greatly impacts the cost of construction. Using space to the most efficient way possible increases the amount of usable space and dictates the type of mechanical system which can be used. There was very insignificant loss of space with the current system as it is located in a mechanical closet local to the each residence.

A total of 2,787 ft^2 of space in the buildings is utilized for mechanical space. This equates to about 2% of the 140,000 gross square footage in lost rentable space.

Mechanical System First Cost

As this project was completed in September of 2005, the actual mechanical costs were obtained. The HVAC cost equates to $2.1 million of the project. The other components of the mechanical first cost include plumbing at $1.0 million and fire protection at $300,000. This mechanical system first cost then sums to the amount of $3.4 million or $24.29 per square feet which is about 21.6% of the building cost.

LEED-NC Version 2.2 Analysis

The Leadership in Energy and Environmental Design (LEED) provides the basic guidelines for building designers to design to green, environmentally friendly, and sustainable standards. This standard was created and is maintained by the United States Green Building Council (USGBC) which is the nation's foremost association of professionals from the building industry in order to promote the design and implementation of environmentally friendly buildings. LEED consists of a point system with different levels of certification depending on how environmentally friendly a building is. Ratings, which can be attained, range from an accredited building to silver, gold, and platinum, where a platinum rating is the highest attainable.

The Sustainable Sites category does not contain any mechanically related points which can be obtained.

The buildings and site do not utilize any Water Efficiency techniques to reduce the amount of water consumed and therefore earns no points.

In the Energy and Atmosphere category, no outside commissioning authority was hired to inspect the systems and therefore does not pass EA Prerequisite 1. For EA Prerequisite 2, no minimum energy level was established and the buildings were designed to ASHRAE Standard 90.1-2004 and as a result do not pass. As for EA Prerequisite 3, CFC refrigerants in the form of R-22 and does not pass the ozone depletion requirement. None of the following Credits for this section are achieved as a result of failure to meet the above prerequisites.

The Materials and Resources Category does not apply to the mechanical system and is not analyzed.

For Indoor Air Quality, EQ Prerequisite 1 is met as seen in Technical Assignment 1 which found the buildings to be in compliance with ASHRAE Standard 62.1. Prerequisite 2 is met since the buildings are smoke free and smoking areas are assumed to be compliant. EQ Credit 1 is not received because CO_2 sensors are not used. Credit 2 cannot be determined with the information at hand. The techniques recommended for Credit 3.1 and 3.2 were not implemented during construction and earn no point. Low-emitting materials were not used for construction and finishes and therefore Credit 4.1 to 4.4 are not earned. Credit 5 is not earned because required systems are not

used. Credit 6.1 is earned as the multi-occupant zones contain light switches for each space and therefore have a high level of control. Credit 6.2 is a possible earned point as each multi-occupant space has its own thermostat for control. Credit 7.1 and 7.2 are not earned as it is not designed to ASHRAE 55 with proper documentation. Credit 8.1 and 8.2 cannot be determined.

There is no credit earned for the final category, Innovation and Design process.

Refer to Appendix B for a spreadsheet breakdown.

Energy Utilization Data

Since this project has been completed for well over a year at the time of this writing, an energy bill from PP&L and Met-Ed was obtained. PP&L is the supplier of gas while Met-Ed supplies electricity. Refer to Appendix C for the bill.

TRANE TRACE 700 Energy & Load Analysis

The following calculations and results were obtained using TRACE 700, which is a simulation of HVAC systems and energy usage. The main sources of load for the spaces were people, lighting, and small appliances. Medium sedentary occupants were assumed along with the previously calculated lighting power density and miscellaneous load of 0.5 – 1.0 W/ft^2 to account for appliances. A schedule was created for the occupants where it is assumed that 20 percent of the occupants are not in the building between 8-5. Also for the intents of this report, the floor multiplier was used where typical apartments are stacked. The results for the calculated design load can be found in Appendix D. The values that were found using the program are going to differ from design document values. This is because of the fact that in order to save time, the design was simplified to four typical spaces so accurate loads for each space was not found. The difference comes from the change in direction in which the spaces face.

TRACE 700 Energy Consumption & Operating Cost

Energy consumption and the utility operating cost of equipment were found for University Ridge using TRACE 700. Gas and electric rates from PP&L and Met-Ed were obtained for the building as stated previously. These rates were then put into the simulation to yield utility costs as seen in Appendix E.

An energy analysis was not performed by Greenman-Pedersen Inc. Engineers because it is not a requirement. The delivery method was one of a Design-Build structure and the extra time and cost required to perform an energy analysis may have hindered the projects cost and schedule.

The yearly energy utilization data which was obtained from a single months meter bill cannot be accurately compared to the actual bill. However, the values for the summer months which were calculated cannot be accurately be determined because the buildings are not fully occupied and therefore the calculated values seem high. Winter values for comparison cannot be accurately compared because of unavailable data. Refer to data in Appendix C and E.

Appendix A

R-13 2x4 Stud Wall U-Value

Material	Insulation	Wood Stud
OA Film	0.17	0.17
Sheathing	1.57	1.57
Insulation	13	-
Wood Stud	-	3.5
5/8 Gypsum Board	0.56	0.56
IA Film	0.68	0.68

R-Value	15.98	6.48
U-Value	0.0626	0.1543

Utot = 0.75(0.0626) + 0.25(0.155) = 0.086

Attic Roof U-Value

Material	Insulation	Wood Stud
OA Film	0.17	0.17
Asphalt Shingles	0.21	0.21
1/2" OSB	0.5	0.5
2x4 Truss	-	3.9
0.5" Air Gap	1.88	1.88
Insulation	30	-
Wood Stud	-	3.9
1/2 Gypsum Board	0.32	0.32
IA Film	0.68	0.68

R-Value	33.76	11.56
U-Value	0.0296	0.0865

Utot = 0.75(0.0296) + 0.25(0.0865) = 0.0354

Silver LINE WINDOWS

NEW CONSTRUCTION WINDOW THERMAL PERFORMANCE

THERMAL TEST INFORMATION

Windows are tested and certified to the NFRC 100-97 specification for the thermal performance of the entire window unit.

WINDOW SERIES	TEST METHOD	GLAZING TYPE	U VALUE	SHGC	VISIBLE LIGHT TRANSMITTANCE	ENERGY STAR COMPLIANCE
1400 Double Hung	NFRC 100-97	Clear I.G.*	0.49	0.63	0.66	-
		LoE² I.G.*	0.35	0.34	0.58	
		LoE² / Argon I.G.*	0.32	0.33	0.58	
		Clear I.G. with Contour Grille**	0.51	0.56	0.59	-
		LoE² I.G. with Contour Grille**	0.38	0.30	0.52	
		LoE² / Argon with Contour Grille**	0.34	0.30	0.52	
1450 / 1460 Fixed Lite	NFRC 100-97	Clear I.G.*	0.50	0.67	0.71	-
		LoE² I.G.*	0.35	0.36	0.61	
		LoE² / Argon I.G.*	0.30	0.35	0.61	
		Clear I.G. with Contour Grille**	0.51	0.61	0.63	-
		LoE² I.G. with Contour Grille**	0.37	0.32	0.55	
		LoE² / Argon with Contour Grille**	0.33	0.32	0.55	
2110 / 2160 Single Hung	NFRC 100-97	Clear I.G.	0.49	0.65	0.69	-
		LoE² I.G.	0.35	0.35	0.60	
		LoE² / Argon I.G.	0.30	0.35	0.60	
		Clear I.G. with Flat Grille	0.49	0.59	0.61	-
		LoE² I.G. with Flat Grille	0.35	0.31	0.54	
		LoE² / Argon with Flat Grille	0.30	0.31	0.54	
2130 / 2135 2180 / 2185 Fixed Lite	NFRC 100-97	Clear I.G.	0.49	0.67	0.71	-
		LoE² I.G.	0.34	0.36	0.61	
		LoE² / Argon I.G.	0.29	0.35	0.61	
		Clear I.G. with Flat Grille	0.49	0.61	0.63	-
		LoE² I.G. with Flat Grille	0.34	0.32	0.55	
		LoE² / Argon with Flat Grille	0.29	0.32	0.55	
2710 / 2760 Single Hung	NFRC 100-97	Clear I.G.	0.52	0.60	0.62	-
		LoE² I.G.	0.38	0.33	0.54	
		LoE² / Argon I.G.	0.34	0.33	0.54	
		Clear I.G. with Flat Grille	0.52	0.55	0.55	-
		LoE² I.G. with Flat Grille	0.38	0.30	0.49	
		LoE² / Argon with Flat Grille	0.34	0.30	0.49	
2800 Slider	NFRC 100-97	Clear I.G.	0.49	0.62	0.66	-
		LoE² I.G.	0.35	0.34	0.58	
		LoE² / Argon I.G.	0.31	0.33	0.58	
		Clear I.G. with Flat Grille	0.49	0.56	0.59	-
		LoE² I.G. with Flat Grille	0.35	0.30	0.52	
		LoE² / Argon with Flat Grille	0.31	0.30	0.52	

* Denotes that windows with a 1/1 pattern or flat grilles share the same U-Values.

** Both contour grilles and flat grilles carry the same Solar Heat Gain Coefficient and Visible Light Transmittance performance values.

For more information on Silver Line Windows, visit us at www.silverlinewindows.com or call us at 800-234-4228

Appendix B

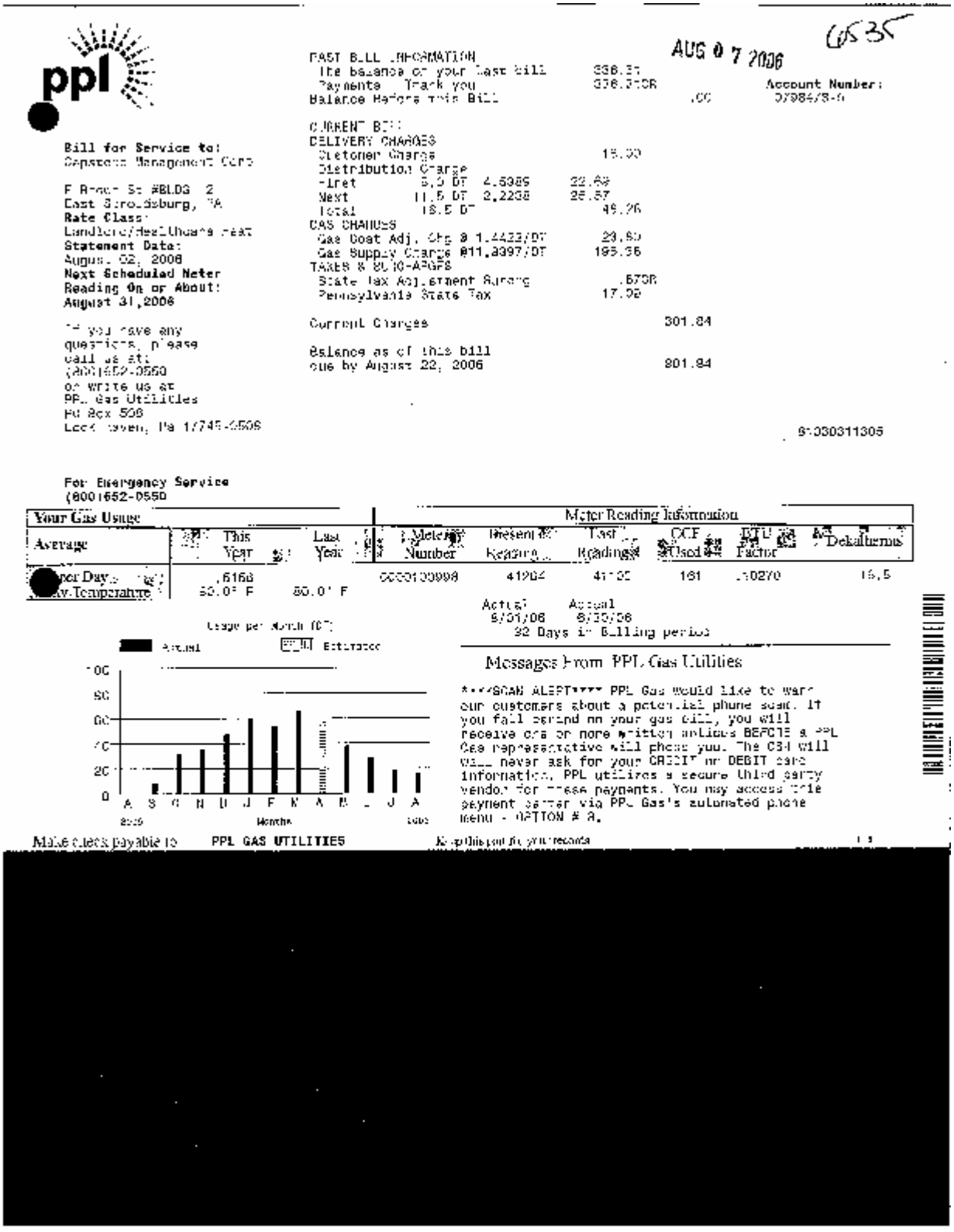
LEED-NC

LEED-NC Version 2.2 Registered Project Checklist

University Ridge at East Stroudsbur University
East Stroudsburg, PA,

Yes	?	No			
			Water Efficiency		5 Points
		x	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1
		x	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1
		x	Credit 2	Innovative Wastewater Technologies	1
		x	Credit 3.1	Water Use Reduction, 20% Reduction	1
		x	Credit 3.2	Water Use Reduction, 30% Reduction	1
Yes	?	No			
			Energy & Atmosphere		17 Points
N			Prereq 1	Fundamental Commissioning of the Building Energy Systems	Required
N			Prereq 2	Minimum Energy Performance	Required
N			Prereq 3	Fundamental Refrigerant Management	Required
		x	Credit 1	Optimize Energy Performance	1 to 10
		x	Credit 2	On-Site Renewable Energy	1 to 3
		x	Credit 3	Enhanced Commissioning	1
		x	Credit 4	Enhanced Refrigerant Management	1
		x	Credit 5	Measurement & Verification	1
		x	Credit 6	Green Power	1
					continued...
Yes	?	No			
			Indoor Environmental Quality		15 Points
Y			Prereq 1	Minimum IAQ Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
		x	Credit 1	Outdoor Air Delivery Monitoring	1
	x		Credit 2	Increased Ventilation	1
		x	Credit 3.1	Construction IAQ Management Plan, During Construction	1
		x	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
		x	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1
		x	Credit 4.2	Low-Emitting Materials, Paints & Coatings	1
		x	Credit 4.3	Low-Emitting Materials, Carpet Systems	1
		x	Credit 4.4	Low-Emitting Materials, Composite Wood & Agrifiber Products	1
		x	Credit 5	Indoor Chemical & Pollutant Source Control	1
x			Credit 6.1	Controllability of Systems, Lighting	1
x			Credit 6.2	Controllability of Systems, Thermal Comfort	1
		x	Credit 7.1	Thermal Comfort, Design	1
		x	Credit 7.2	Thermal Comfort, Verification	1
	x		Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1
	x		Credit 8.2	Daylight & Views, Views for 90% of Spaces	1

Appendix C



ppl

AUG 0 7 2006

PAST BILL INFORMATION
The balance on your last bill 336.37
Payments - Thank you 336.37CR
Balance Before this Bill .00

Account Number:
3784/8-6

CURRENT BILL
DELIVERY CHARGES
Customer Charge 15.00
Distribution Charge
First 3.0 DT 4.6385 22.88
Next 11.5 DT 2.2238 25.57
Total 18.5 DT 48.26
GAS CHARGES
Gas Cost Adj. Chg @ 1.4422/DT 28.80
Gas Supply Charge @11.8397/DT 185.36
TAXES & GOVT-APPFS
State Tax Adjustment Surcg .67CR
Pennsylvania State Tax 17.98

Current Charges 301.84

Balance as of this bill
due by August 22, 2006 301.84

Bill for Service to:
Customer Management Corp

F Road St #BLDG 2
East Stroudsburg, PA
Rate Class:
Landlord/HeatUnder Heat
Statement Date:
August 02, 2008
Next Scheduled Meter
Reading On or About:
August 31,2008

If you have any questions, please call us at: (800)652-0550 or write us at PPL Gas Utilities PO Box 509 Lock Haven, PA 17745-0509

9:030311305

For Emergency Service
(800)652-0550

Your Gas Usage

Average	This Year	Last Year
per Day	.6168	
Av. Temperature	60.0° F	60.0° F

Meter Reading Information

Meter Number	Present Reading	Last Reading	CCF Used	BTU Factor	Dekatherms
0000120998	41984	41703	181	1.0270	18.5

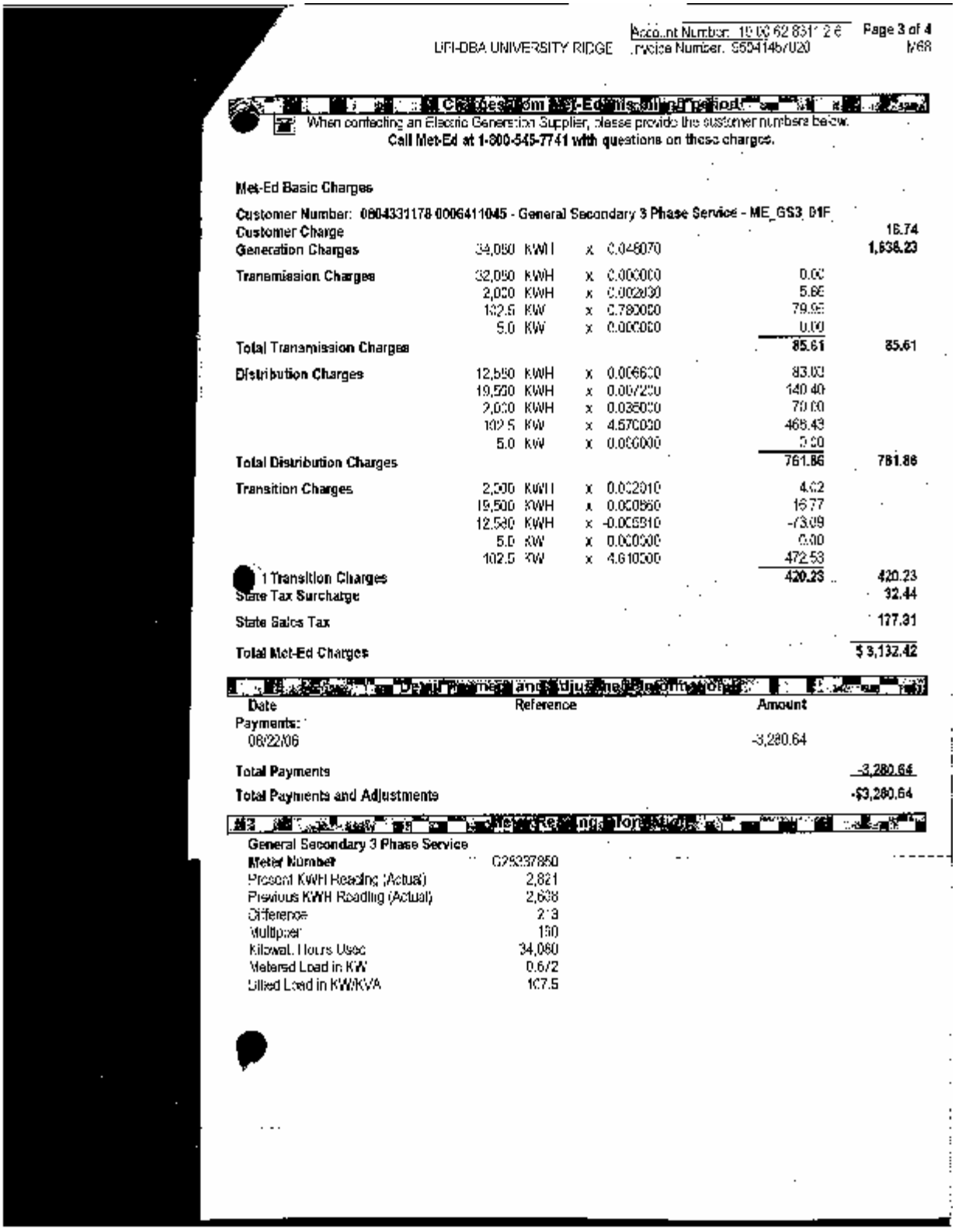
Actual 6/01/06 Actual 6/30/06
32 Days in Billing period

Usage per Month (DT)
Actual Estimated
60
50
40
30
20
0
A S O N D J F M A M J J A
2005 Months 2006

Messages From PPL Gas Utilities

****SCAM ALERT**** PPL Gas would like to warn our customers about a potential phone scam. If you fall behind on your gas bill, you will receive one or more written notices BEFORE a PPL Gas representative will phone you. The CSR will will never ask for your CREDIT or DEBIT card information. PPL utilizes a secure third party vendor for these payments. You may access this payment center via PPL Gas's automated phone menu - OPTION # 8.

Make checks payable to PPL GAS UTILITIES Keep this part for your records



UFI-DBA UNIVERSITY RIDGE Account Number: 15 00 62 831 2 6 Page 3 of 4
Invoice Number: S594146/020 M68

Charges from Met-Ed this Billing Period

When contacting an Electric Generation Supplier, please provide the customer numbers below.
Call Met-Ed at 1-800-545-7741 with questions on these charges.

Met-Ed Basic Charges

Customer Number: 0804331178-0006411045 - General Secondary 3 Phase Service - ME_GS3_01F

Customer Charge					16.74
Generation Charges	34,080	KWH	x 0.046070		1,636.23
Transmission Charges	32,080	KWH	x 0.000000	0.00	
	2,000	KWH	x 0.002830	5.66	
	102.5	KW	x 0.780000	79.95	
	5.0	KW	x 0.000000	0.00	
Total Transmission Charges				85.61	85.61
Distribution Charges	12,550	KWH	x 0.006620	83.03	
	19,530	KWH	x 0.007200	140.60	
	2,000	KWH	x 0.035000	70.00	
	102.5	KW	x 4.570000	468.43	
	5.0	KW	x 0.000000	0.00	
Total Distribution Charges				761.86	761.86
Transition Charges	2,000	KWH	x 0.002010	4.02	
	19,500	KWH	x 0.000860	16.77	
	12,580	KWH	x -0.005910	-73.09	
	5.0	KW	x 0.000000	0.00	
	102.5	KW	x 4.610000	472.53	
1 Transition Charges				420.23	420.23
State Tax Surcharge					32.44
State Sales Tax					177.31
Total Met-Ed Charges					$ 3,132.42

Payments and Adjustments

Date	Reference	Amount	
Payments:			
08/22/06		-3,280.64	
Total Payments			-3,280.64
Total Payments and Adjustments			-$3,280.64

Meter Reading Information

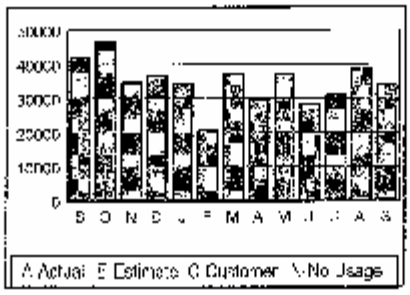
General Secondary 3 Phase Service

Meter Number	G29337850
Present KWH Reading (Actual)	2,821
Previous KWH Reading (Actual)	2,638
Difference	2 3
Multiplier	150
Kilowatt Hours Used	34,080
Metered Load in KW	0.6/2
Billed Load in KW/KVA	107.5

[redacted]

Account Number: 10 [illegible] 8311 2 6 Page 4 of 4
Invoice Number: 9C041407C0

Usage Comparison



	Sep 05	Sep 06
Average Daily Use (KWH)	275	136
Average Daily Temperature	72	69
Days in Billing Period	33	30
Last 12 Months Use (KWH)		708,250
Average Monthly Use (KWH)		34,127

Generation prices and charges are set by the electric generation supplier you have chosen.
The Public Utility Commission regulates distribution prices and services.
The Federal Energy Regulatory Commission regulates transmission prices and services.

Appendix D

ENGINEERING CHECKS

By ae

Description	Type	COOLING % OA	COOLING cfm/ft²	COOLING cfm/ton	COOLING ft²/ton	COOLING Btu/hr·ft²	HEATING % OA	HEATING cfm/ft²	HEATING Btu/hr·ft²	Floor Area ft²
Bldg 1 - NE Apartments	Zone	0.00	1.04	609.2	586.9	20.45	0.00	1.04	-4.76	2,745
Bldg 1 - SE Apartment	Zone	0.00	1.03	608.6	588.4	20.39	0.00	1.03	-4.76	2,745
Bldg 1 - SW Apartment	Zone	0.00	1.35	657.6	487.5	24.62	0.00	1.35	-5.11	1,830
Bldg 1 - NW Apartments	Zone	0.00	1.33	655.2	493.9	24.29	0.00	1.33	-5.11	1,830
Bldg 1 - 2nd SW Apt	Zone	0.00	1.58	687.7	435.3	27.57	0.00	1.58	-6.30	776
Bldg 1 - 2nd NW Apt	Zone	0.00	1.57	707.5	450.7	26.62	0.00	1.57	-6.63	776
Bldg 2 - NE Apt	Zone	0.00	0.59	499.8	852.0	14.09	0.00	0.59	-4.25	3,572
Bldg 2 - SE Apt	Zone	0.00	1.27	738.4	579.8	20.70	0.00	1.27	-4.42	2,679
Bldg 2 - SW Apt	Zone	0.00	1.20	731.4	609.2	19.70	0.00	1.20	-3.43	2,679
Bldg 2 - NW Apt	Zone	0.00	0.56	505.5	905.8	13.25	0.00	0.56	-3.26	3,572
Bldg 3 - NW Apt	Zone	0.00	0.73	556.6	767.1	15.64	0.00	0.73	-4.25	3,572
Bldg 3 - NE Apt	Zone	0.00	0.53	479.4	907.1	13.23	0.00	0.53	-3.26	3,572
Bldg 3 - SE Apt	Zone	0.00	1.22	732.9	602.6	19.91	0.00	1.22	-3.43	2,679
Bldg 3 - SW Apt	Zone	0.00	1.28	738.9	578.3	20.75	0.00	1.28	-4.42	2,679
Bldg 5 - NW Apt	Zone	0.00	0.74	560.3	755.2	15.89	0.00	0.74	-4.42	2,679
Bldg 5 - NE Apt	Zone	0.00	0.54	483.5	893.7	13.43	0.00	0.54	-3.43	2,679
Bldg 5 - SE Apt	Zone	0.00	1.21	732.5	604.3	19.86	0.00	1.21	-3.26	3,572
Bldg 5 - SW Apt	Zone	0.00	1.27	738.2	581.0	20.65	0.00	1.27	-4.25	3,572
Bldg 6 - NE Apt	Zone	0.00	0.60	502.9	842.2	14.25	0.00	0.60	-4.42	2,679
Bldg 6 - SE Apt	Zone	0.00	1.27	738.0	581.4	20.64	0.00	1.27	-4.25	3,572
Bldg 6 - SW Apt	Zone	0.00	1.20	730.9	611.0	19.64	0.00	1.20	-3.26	3,572
Bldg 6 - NW Apt	Zone	0.00	0.57	512.2	892.4	13.45	0.00	0.57	-3.43	2,679
Bldg 7 - NW Apt	Zone	0.00	0.74	560.3	755.2	15.89	0.00	0.74	-4.42	2,679
Bldg 7 - NE Apt	Zone	0.00	0.54	483.5	893.7	13.43	0.00	0.54	-3.43	2,679
Bldg 7 - SE Apt	Zone	0.00	1.21	732.5	604.3	19.86	0.00	1.21	-3.26	3,572
Bldg 7 - SW Apt	Zone	0.00	1.27	738.2	581.0	20.65	0.00	1.27	-4.25	3,572
Bldg 8 - NE Apt	Zone	0.00	0.60	502.9	842.2	14.25	0.00	0.60	-4.42	2,679
Bldg 8 - SE Apt	Zone	0.00	1.27	738.0	581.4	20.64	0.00	1.27	-4.25	3,572
Bldg 8 - SW Apt	Zone	0.00	1.20	730.9	611.0	19.64	0.00	1.20	-3.26	3,572
Bldg 8 - NW Apt	Zone	0.00	0.57	512.2	892.4	13.45	0.00	0.57	-3.43	2,679
Bldg 9 - NW Apt	Zone	0.00	0.74	560.3	755.2	15.89	0.00	0.74	-4.42	2,679
Bldg 9 - NE Apt	Zone	0.00	0.54	483.5	893.7	13.43	0.00	0.54	-3.43	2,679
Bldg 9 - SE Apt	Zone	0.00	1.21	732.5	604.3	19.86	0.00	1.21	-3.26	3,572
Bldg 9 - SW Apt	Zone	0.00	1.27	738.2	581.0	20.65	0.00	1.27	-4.25	3,572
Bldg 10 - NE Apt	Zone	0.00	0.60	502.9	842.2	14.25	0.00	0.60	-4.42	2,679
Bldg 10 - SE Apt	Zone	0.00	1.27	738.0	581.4	20.64	0.00	1.27	-4.25	3,572
Bldg 10 - SW Apt	Zone	0.00	1.20	730.9	611.0	19.64	0.00	1.20	-3.26	3,572
Bldg 10 - NW Apt	Zone	0.00	0.57	512.2	892.4	13.45	0.00	0.57	-3.43	2,679
Bldg 4 - NE Apt	Zone	0.00	0.60	502.9	842.2	14.25	0.00	0.60	-4.42	2,679
Bldg 4 - SE Apt	Zone	0.00	1.27	738.4	579.8	20.70	0.00	1.27	-4.42	2,679

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Page 1 of Engineering Checks Report

ENGINEERING CHECKS

By ae

Description	Type	COOLING % OA	COOLING cfm/ft²	COOLING cfm/ton	COOLING ft²/ton	COOLING Btu/hr·ft²	HEATING % OA	HEATING cfm/ft²	HEATING Btu/hr·ft²	Floor Area ft²
Bldg 4 - NW Apt	Zone	0.00	0.74	560.3	755.2	15.89	0.00	0.74	-4.42	2,679
Bldg 4 - SW Apt	Zone	0.00	1.28	738.9	578.3	20.75	0.00	1.28	-4.42	2,679
Terminal A/C	System - Packaged Terminal Air Conditioner	0.00	0.97	650.8	669.3	17.93	0.00	0.97	-3.99	121,434
Bldg 1 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.22	-15.81	333
Bldg 2 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 3 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 4 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.24	-17.32	333
Bldg 5 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 6 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 7 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 8 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 9 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Bldg 10 - Stairs	Zone	0.00	0.00	0.0	0.0	0.00	0.00	0.28	-20.03	333
Heating only	System - Unit Heaters	0.00	0.00	0.0	0.0	0.00	0.00	0.27	-19.34	3,330
Bldg 1 - Game/TV	Zone	12.24	1.09	638.8	585.6	20.49	12.24	1.09	-10.00	1,123
Bldg 1 - Office/Reception	Zone	18.27	1.17	451.6	386.5	31.05	18.27	1.17	-18.28	281
Bldg 1 - Group Meeting	Zone	27.03	0.70	383.9	547.4	21.92	27.03	0.70	-12.09	633
Bldg 1 - Conference	Zone	93.10	0.74	200.8	272.6	44.02	93.10	0.74	-43.72	175
Bldg 1 - Office - C009	Zone	52.61	0.30	266.7	876.2	13.70	52.61	0.30	-10.21	281
Bldg 1 - File/Closet	Zone	0.00	0.34	1,000.6	2,935.0	4.09	0.00	0.34	-4.67	145
Bldg 1 - Cyber Lounge	Zone	12.24	1.88	983.3	524.2	22.89	12.24	1.88	-14.64	653
Bldg 1 - Corridor/Bathroom	Zone	0.00	4.36	15,381.7	3,515.8	3.41	0.00	4.36	0.00	280
Bldg 1 - Fitness	Zone	7.76	5.78	3,243.4	561.3	21.38	7.76	5.78	-28.57	212
Commons	System - Packaged Terminal Air Conditioner	12.47	1.57	939.5	598.7	20.04	12.47	1.57	-13.44	3,783

System Checksums

By ae

Commons

Packaged Terminal Air Conditioner

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 10
Outside Air: OADB/WB/HR: 80 / 69 / 92

	Space Sens. + Lat. Btu/h	Plenum Sens. + Lat Btu/h	Net Total Btu/h	Percent Of Total (%)
Envelope Loads				
Skylite Solar	0	0	0	0.00
Skylite Cond	0	0	0	0.00
Roof Cond	0	0	0	0.00
Glass Solar	26,071	0	26,071	34.38
Glass Cond	593	0	593	0.78
Wall Cond	2,062	0	2,062	2.72
Partition	133		133	0.18
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	28,858	0	28,858	38.06
Internal Loads				
Lights	5,165	1,291	6,456	8.51
People	17,120		17,120	22.58
Misc	6,570	0	6,570	8.67
Sub Total ==>	28,855	1,291	30,146	39.76
Ceiling Load	0	0	0	0.00
Ventilation Load	0	0	17,078	22.52
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-262	-262	-0.35
Sup. Fan Heat			0	0.00
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
Grand Total ==>	57,713	1,029	75,820	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 9
OADB: 77

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0.00
Skylite Cond	0	0.00
Roof Cond	0	0.00
Glass Solar	26,844	51.68
Glass Cond	289	0.56
Wall Cond	1,904	3.67
Partition	133	0.26
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	29,170	56.16
Internal Loads		
Lights	5,165	9.94
People	11,035	21.25
Misc	6,570	12.65
Sub Total ==>	22,770	43.84
Ceiling Load	0	0.00
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
Grand Total ==>	51,940	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 10

	Space Peak Space Sens Btu/h	Coil Peak Tot Sens Btu/h	Percent Of Total (%)
Envelope Loads			
Skylite Solar	0	0	0.00
Skylite Cond	0	0	0.00
Roof Cond	0	0	0.00
Glass Solar	0	0	0.00
Glass Cond	-7,466	-7,466	15.83
Wall Cond	-4,199	-4,199	8.90
Partition	-1,444	-1,444	3.06
Exposed Floor	0	0	0.00
Infiltration	-1	-1	0.00
Sub Total ==>	-13,110	-13,110	27.79
Internal Loads			
Lights	0	0	0.00
People	11,035	11,035	-23.39
Misc	6,570	6,570	-13.93
Sub Total ==>	17,605	17,605	-37.32
Ceiling Load	0	0	0.00
Ventilation Load	0	-47,178	100.00
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-4,496	9.53
Additional Reheat		0	0.00
Grand Total ==>	4,495	-47,178	100.00

TEMPERATURES

	Cooling	Heating
SADB	64.0	66.6
Plenum	72.0	66.0
Return	72.2	66.0
Ret/OA	73.1	60.8
Fn MtrTD	0.0	0.0
Fn BltTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Vent	740	740
Infil	0	0
Supply	5,936	5,936
MinStop/Rh	0	0
Return	5,936	5,936
Exhaust	740	740
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	12.5	12.5
cfm/ft²	1.57	1.57
cfm/ton	939.51	
ft²/ton	598.73	
Btu/hr·ft²	20.04	-13.44
No. People	47	

COOLING COIL SELECTION

	Total Capacity ton	Total Capacity MBh	Sens Cap. MBh	Coil Airflow cfm	Enter DB/WB/HR °F	°F	gr/lb	Leave DB/WB/HR °F	°F	gr/lb
Main Clg	6.3	75.8	56.0	5,936	73.1	63.3	72.7	64.0	59.2	68.7
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.3	75.8								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	3,783		
Part	663		
ExFlr	0		
Roof	0	0	0
Wall	1,027	252	25

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-50.8	5,936	60.8	66.6
Aux Htg	0.0	0	0.0	0.0
Preheat	-21.3	5,936	60.8	64.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-50.8			

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
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System Checksums

By ae

Heating only — **Unit Heaters**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 0 / 0
Outside Air: OADB/WB/HR: 0 / 0 / 0

	Space Sens. + Lat. Btu/h	Plenum Sens. + Lat Btu/h	Net Total Btu/h	Percent Of Total (%)
Envelope Loads				
Skylite Solar	0	0	0	0.00
Skylite Cond	0	0	0	0.00
Roof Cond	0	0	0	0.00
Glass Solar	0	0	0	0.00
Glass Cond	0	0	0	0.00
Wall Cond	0	0	0	0.00
Partition	0		0	0.00
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	0	0	0	0.00
Internal Loads				
Lights	0	0	0	0.00
People	0		0	0.00
Misc	0	0	0	0.00
Sub Total ==>	0	0	0	0.00
Ceiling Load	0	0	0	0.00
Ventilation Load	0	0	0	0.00
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		0	0	0.00
Sup. Fan Heat			0	0.00
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
Grand Total ==>	0	0	0	100.00

CLG SPACE PEAK

Mo/Hr: 0 / 0
OADB: 0

	Space Sensible Btu/h	Percent Of Total (%)
Skylite Solar	0	0.00
Skylite Cond	0	0.00
Roof Cond	0	0.00
Glass Solar	0	0.00
Glass Cond	0	0.00
Wall Cond	0	0.00
Partition	0	0.00
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	0	0.00
Lights	0	0.00
People	0	0.00
Misc	0	0.00
Sub Total ==>	0	0.00
Ceiling Load	0	0.00
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
Grand Total ==>	0	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 10

	Space Peak Space Sens Btu/h	Coil Peak Tot Sens Btu/h	Percent Of Total (%)
Envelope Loads			
Skylite Solar	0	0	0.00
Skylite Cond	0	0	0.00
Roof Cond	-5,372	-5,372	8.34
Glass Solar	0	0	0.00
Glass Cond	-46,316	-46,316	71.92
Wall Cond	-12,711	-12,711	19.74
Partition	0	0	0.00
Exposed Floor	0	0	0.00
Infiltration	-1	-1	0.00
Sub Total ==>	-64,400	-64,400	100.00
Internal Loads			
Lights	0	0	0.00
People	0	0	0.00
Misc	0	0	0.00
Sub Total ==>	0	0	0.00
Ceiling Load	0	0	0.00
Ventilation Load	0	0	0.00
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Grand Total ==>	-64,400	-64,400	100.00

TEMPERATURES

	Cooling	Heating
SADB	0.0	125.0
Plenum	0.0	60.0
Return	0.0	60.0
Ret/OA	0.0	60.0
Fn MtrTD	0.0	0.0
Fn BltTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Vent	0	0
Infil	0	0
Supply	0	901
MinStop/Rh	0	0
Return	0	901
Exhaust	0	0
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	0.0	0.0
cfm/ft²	0.00	0.27
cfm/ton	0.00	
ft²/ton	0.00	
Btu/hr·ft²	0.00	-19.34
No. People	0	

COOLING COIL SELECTION

	Total Capacity ton	Total Capacity MBh	Sens Cap. MBh	Coil Airflow cfm	Enter DB/WB/HR °F	°F	gr/lb	Leave DB/WB/HR °F	°F	gr/lb
Main Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.0	0.0								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	3,330		
Part	0		
ExFlr	0		
Roof	3,330	0	0
Wall	4,976	1,853	37

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-64.4	901	60.0	125.0
Aux Htg	0.0	0	0.0	0.0
Preheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-64.4			

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
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System Checksums

By ae

Terminal A/C — **Packaged Terminal Air Conditioner**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 14
Outside Air: OADB/WB/HR: 89 / 73 / 96

	Space Sens. + Lat. Btu/h	Plenum Sens. + Lat Btu/h	Net Total Btu/h	Percent Of Total (%)
Envelope Loads				
Skylite Solar	0	0	0	0.00
Skylite Cond	0	0	0	0.00
Roof Cond	61,774	0	61,774	2.84
Glass Solar	810,504	0	810,504	37.23
Glass Cond	64,437	0	64,437	2.96
Wall Cond	225,693	0	225,693	10.37
Partition	0		0	0.00
Exposed Floor	0		0	0.00
Infiltration	151,922		151,922	6.98
Sub Total ==>	1,314,330	0	1,314,330	60.37
Internal Loads				
Lights	165,782	41,445	207,227	9.52
People	243,450		243,450	11.18
Misc	414,454	0	414,454	19.04
Sub Total ==>	823,686	41,445	865,132	39.73
Ceiling Load	0	0	0	0.00
Ventilation Load	0	0	0	0.00
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-2,165	-2,165	-0.10
Sup. Fan Heat			0	0.00
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
Grand Total ==>	2,138,016	39,280	2,177,296	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 14
OADB: 83

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0.00
Skylite Cond	0	0.00
Roof Cond	63,794	3.25
Glass Solar	811,013	41.35
Glass Cond	62,748	3.20
Wall Cond	228,954	11.67
Partition	0	0.00
Exposed Floor	0	0.00
Infiltration	79,449	4.05
Sub Total ==>	1,245,957	63.52
Internal Loads		
Lights	165,782	8.45
People	135,250	6.90
Misc	414,454	21.13
Sub Total ==>	715,486	36.48
Ceiling Load	0	0.00
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
Grand Total ==>	1,961,444	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 10

	Space Peak Space Sens Btu/h	Coil Peak Tot Sens Btu/h	Percent Of Total (%)
Envelope Loads			
Skylite Solar	0	0	0.00
Skylite Cond	0	0	0.00
Roof Cond	-76,838	-76,838	15.84
Glass Solar	0	0	0.00
Glass Cond	-302,435	-302,435	62.34
Wall Cond	-287,799	-287,799	59.33
Partition	0	0	0.00
Exposed Floor	0	0	0.00
Infiltration	-367,738	-367,738	75.81
Sub Total ==>	-1,034,810	-1,034,810	213.32
Internal Loads			
Lights	0	0	0.00
People	135,250	135,250	-27.88
Misc	414,454	414,454	-85.44
Sub Total ==>	549,704	549,704	-113.32
Ceiling Load	0	0	0.00
Ventilation Load	0	0	0.00
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Grand Total ==>	-485,106	-485,105	100.00

TEMPERATURES

	Cooling	Heating
SADB	56.9	71.7
Plenum	72.0	68.0
Return	72.3	68.0
Ret/OA	72.3	68.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Fric	0.0	0.0

AIRFLOWS

	Cooling	Heating
Vent	0	0
Infil	5,768	5,768
Supply	118,078	118,078
MinStop/Rh	0	0
Return	123,846	123,846
Exhaust	5,768	5,768
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	0.0	0.0
cfm/ft²	0.97	0.97
cfm/ton	650.78	
ft²/ton	669.27	
Btu/hr·ft²	17.93	-3.99
No. People	541	

COOLING COIL SELECTION

	Total Capacity ton	Total Capacity MBh	Sens Cap. MBh	Coil Airflow cfm	Enter DB °F	Enter WB °F	Enter HR gr/lb	Leave DB °F	Leave WB °F	Leave HR gr/lb
Main Clg	181.4	2,177.3	1,999.0	118,078	72.3	60.1	59.5	56.9	53.7	57.3
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total	181.4	2,177.3								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	121,434		
Part	0		
ExFlr	0		
Roof	37,360	0	0
Wall	67,906	10,208	15

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-485.1	118,078	66.0	71.7
Aux Htg	0.0	0	0.0	0.0
Preheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-485.1			

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
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PEAK COOLING LOADS
MAIN SYSTEM
By ae

Description		Floor Area ft²	SPACE: Peak Time Mo/Hr	SPACE: OA Cond. DB/WB °F		SPACE: Room Dry Bulb °F	SPACE: Supply Dry Bulb °F	SPACE: Space Air Flow cfm	SPACE: Space Sensible Load Btu/h	SPACE: Space Latent Load Btu/h	COIL: Peak Time Mo/Hr	COIL: OA Cond. DB/WB °F		COIL: Supply Dry Bulb °F	COIL: Coil Air Flow cfm	COIL: Coil Sensible Load Btu/h	COIL: Coil Latent Load Btu/h
Bldg 1 - NE Apartments	Rm/Zn Tot	2,745	7/9	77	68	72	56.1	2,849	49,928	5,302	7/9	77	68	56.1	2,849	50,824	5,302
Bldg 1 - SE Apartment	Rm/Zn Tot	2,745	7/9	77	68	72	56.0	2,839	49,785	5,302	7/9	77	68	56.0	2,839	50,680	5,302
Bldg 1 - SW Apartment	Rm/Zn Tot	1,830	7/17	88	71	72	56.9	2,469	41,100	3,344	7/17	88	71	56.9	2,469	41,704	3,344
Bldg 1 - NW Apartments	Rm/Zn Tot	1,830	7/17	88	71	72	56.8	2,427	40,511	3,344	7/17	88	71	56.8	2,427	41,114	3,344
Bldg 1 - 2nd SW Apt	Rm/Zn Tot	776	7/17	88	71	72	57.3	1,226	19,794	1,340	7/17	88	71	57.3	1,226	20,051	1,340
Bldg 1 - 2nd NW Apt	Rm/Zn Tot	776	7/17	88	71	72	57.6	1,218	19,262	1,140	7/17	88	71	57.6	1,218	19,519	1,140
Bldg 2 - NE Apt	Rm/Zn Tot	3,572	7/14	89	73	72	53.9	2,096	41,739	7,446	7/14	89	73	53.9	2,096	42,867	7,446
Bldg 2 - SE Apt	Rm/Zn Tot	2,679	9/13	81	63	72	58.1	3,412	52,139	2,427	9/13	81	63	58.1	3,412	53,020	2,427
Bldg 2 - SW Apt	Rm/Zn Tot	2,679	9/13	81	63	72	58.0	3,216	49,462	2,427	9/13	81	63	58.0	3,216	50,341	2,427
Bldg 2 - NW Apt	Rm/Zn Tot	3,572	7/18	86	70	72	54.2	1,994	39,089	6,610	7/15	90	73	54.4	1,994	39,795	7,528
Bldg 3 - NW Apt	Rm/Zn Tot	3,572	7/18	86	70	72	55.1	2,592	48,127	6,610	7/18	86	70	55.1	2,592	49,271	6,610
Bldg 3 - NE Apt	Rm/Zn Tot	3,572	7/15	90	73	72	53.4	1,888	38,606	7,528	7/15	90	73	53.4	1,888	39,724	7,528
Bldg 3 - SE Apt	Rm/Zn Tot	2,679	9/13	81	63	72	58.0	3,259	50,043	2,427	9/13	81	63	58.0	3,259	50,923	2,427
Bldg 3 - SW Apt	Rm/Zn Tot	2,679	9/14	83	64	72	58.1	3,423	52,284	2,425	9/14	83	64	58.1	3,423	53,166	2,425
Bldg 5 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	55.2	1,988	36,753	4,958	7/18	86	70	55.2	1,988	37,612	4,958
Bldg 5 - NE Apt	Rm/Zn Tot	2,679	7/15	90	73	72	53.5	1,449	29,486	5,646	7/15	90	73	53.5	1,449	30,326	5,646
Bldg 5 - SE Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.0	4,330	66,518	3,236	9/13	81	63	58.0	4,330	67,691	3,236
Bldg 5 - SW Apt	Rm/Zn Tot	3,572	9/14	83	64	72	58.1	4,538	69,363	3,233	9/14	83	64	58.1	4,538	70,538	3,233
Bldg 6 - NE Apt	Rm/Zn Tot	2,679	7/14	89	73	72	53.9	1,599	31,739	5,584	7/14	89	73	53.9	1,599	32,586	5,584
Bldg 6 - SE Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.1	4,534	69,312	3,236	9/13	81	63	58.1	4,534	70,487	3,236
Bldg 6 - SW Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.0	4,273	65,743	3,236	9/13	81	63	58.0	4,273	66,916	3,236
Bldg 6 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	54.3	1,538	29,974	4,958	7/15	90	73	54.5	1,538	30,379	5,646
Bldg 7 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	55.2	1,988	36,753	4,958	7/18	86	70	55.2	1,988	37,612	4,958
Bldg 7 - NE Apt	Rm/Zn Tot	2,679	7/15	90	73	72	53.5	1,449	29,486	5,646	7/15	90	73	53.5	1,449	30,326	5,646
Bldg 7 - SE Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.0	4,330	66,518	3,236	9/13	81	63	58.0	4,330	67,691	3,236
Bldg 7 - SW Apt	Rm/Zn Tot	3,572	9/14	83	64	72	58.1	4,538	69,363	3,233	9/14	83	64	58.1	4,538	70,538	3,233
Bldg 8 - NE Apt	Rm/Zn Tot	2,679	7/14	89	73	72	53.9	1,599	31,739	5,584	7/14	89	73	53.9	1,599	32,586	5,584
Bldg 8 - SE Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.1	4,534	69,312	3,236	9/13	81	63	58.1	4,534	70,487	3,236
Bldg 8 - SW Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.0	4,273	65,743	3,236	9/13	81	63	58.0	4,273	66,916	3,236
Bldg 8 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	54.3	1,538	29,974	4,958	7/15	90	73	54.5	1,538	30,379	5,646
Bldg 9 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	55.2	1,988	36,753	4,958	7/18	86	70	55.2	1,988	37,612	4,958
Bldg 9 - NE Apt	Rm/Zn Tot	2,679	7/15	90	73	72	53.5	1,449	29,486	5,646	7/15	90	73	53.5	1,449	30,326	5,646

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
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PEAK COOLING LOADS
MAIN SYSTEM
By ae

Description		Floor Area ft²	SPACE Peak Time Mo/Hr	SPACE OA Cond. DB/WB °F		SPACE Room Dry Bulb °F	SPACE Supply Dry Bulb °F	SPACE Space Air Flow cfm	SPACE Space Sensible Load Btu/h	SPACE Space Latent Load Btu/h	COIL Peak Time Mo/Hr	COIL OA Cond. DB/WB °F		COIL Supply Dry Bulb °F	COIL Coil Air Flow cfm	COIL Coil Sensible Load Btu/h	COIL Coil Latent Load Btu/h
Bldg 9 - SE Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.0	4,330	66,518	3,236	9/13	81	63	58.0	4,330	67,691	3,236
Bldg 9 - SW Apt	Rm/Zn Tot	3,572	9/14	83	64	72	58.1	4,536	69,363	3,233	9/14	83	64	58.1	4,536	70,536	3,233
Bldg 10 - NE Apt	Rm/Zn Tot	2,679	7/14	89	73	72	53.9	1,599	31,739	5,584	7/14	89	73	53.9	1,599	32,586	5,584
Bldg 10 - SE Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.1	4,534	69,312	3,236	9/13	81	63	58.1	4,534	70,487	3,236
Bldg 10 - SW Apt	Rm/Zn Tot	3,572	9/13	81	63	72	58.0	4,273	65,743	3,236	9/13	81	63	58.0	4,273	66,916	3,236
Bldg 10 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	54.3	1,538	29,974	4,958	7/15	90	73	54.5	1,538	30,379	5,646
Bldg 4 - NE Apt	Rm/Zn Tot	2,679	7/14	89	73	72	53.9	1,599	31,739	5,584	7/14	89	73	53.9	1,599	32,586	5,584
Bldg 4 - SE Apt	Rm/Zn Tot	2,679	9/13	81	63	72	58.1	3,412	52,139	2,427	9/13	81	63	58.1	3,412	53,020	2,427
Bldg 4 - NW Apt	Rm/Zn Tot	2,679	7/18	86	70	72	55.2	1,988	36,753	4,958	7/18	86	70	55.2	1,988	37,612	4,958
Bldg 4 - SW Apt	Rm/Zn Tot	2,679	9/14	83	64	72	58.1	3,423	52,284	2,425	9/14	83	64	58.1	3,423	53,166	2,425
Terminal A/C	Sys Tot/Ave	121,434		83	64	72	56.9	118,078	1,961,444	175,328		89	73	56.9	118,078	1,998,987	178,309
Terminal A/C	Sys Block	121,434	9/14	83	64	72	56.9	118,078	1,757,301	109,315	7/14	89	73	59.4	118,078	1,670,815	252,530
Bldg 1 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 2 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 3 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 4 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 5 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 6 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 7 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 8 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 9 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 10 - Stairs	Rm/Zn Tot	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Heating only	Sys Tot/Ave	0		0	0	0	0.0	0	0	0		0	0	0.0	0	0	0
Heating only	Sys Block	0	0/0	0	0	0	0.0	0	0	0	0/0	0	0	0.0	0	0	0
Bldg 1 - Game/TV	Rm/Zn Tot	1,123	9/10	71	59	72	58.7	1,225	17,886	1,050	7/9	77	68	58.9	1,225	18,701	4,310
Bldg 1 - Office/Reception	Rm/Zn Tot	281	7/9	77	68	72	54.3	328	6,374	620	7/9	77	68	54.3	328	6,769	1,955
Bldg 1 - Group Meeting	Rm/Zn Tot	633	7/9	77	68	72	53.2	444	9,176	1,240	7/9	77	68	53.2	444	9,966	3,911
Bldg 1 - Conference	Rm/Zn Tot	175	7/15	90	73	72	55.0	129	2,409	1,240	7/15	90	73	55.0	129	4,787	2,917
Bldg 1 - Office - C009	Rm/Zn Tot	281	7/15	90	73	72	55.0	86	1,598	465	7/15	90	73	55.0	86	2,534	1,315
Bldg 1 - File/Closet	Rm/Zn Tot	145	7/17	88	71	72	62.0	49	543	0	7/17	88	71	62.0	49	593	0
Bldg 1 - Cyber Lounge	Rm/Zn Tot	653	7/9	77	68	72	63.6	1,225	11,286	1,050	7/9	77	68	63.6	1,225	12,273	2,676
Bldg 1 - Corridor/Bathroom	Rm/Zn Tot	280	7/15	90	73	72	71.4	1,225	860	0	7/15	90	73	71.4	1,225	956	0

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Peak Clg Loads Main System report page 2

PEAK COOLING LOADS
MAIN SYSTEM
By ae

Description		Floor Area ft²	SPACE Peak Time Mo/Hr	SPACE OA Cond. DB/WB °F	SPACE Room Dry Bulb °F	SPACE Supply Dry Bulb °F	SPACE Space Air Flow cfm	SPACE Space Sensible Load Btu/h	SPACE Space Latent Load Btu/h	COIL Peak Time Mo/Hr	COIL OA Cond. DB/WB °F	COIL Supply Dry Bulb °F	COIL Coil Air Flow cfm	COIL Coil Sensible Load Btu/h	COIL Coil Latent Load Btu/h
Bldg 1 - Fitness	Rm/Zn Tot	212	7/15	90 73	72	70.7	1,225	1,809	420	7/15	90 73	70.7	1,225	3,755	777
Commons	Sys Tot/Ave	3,783		77 68	72	64.0	5,936	51,940	6,085		80 69	64.1	5,936	57,959	17,862
Commons	Sys Block	3,783	7/9	77 68	72	64.0	5,936	51,425	6,085	7/10	80 69	64.4	5,936	56,637	16,981

PEAK HEATING LOADS
MAIN SYSTEM
By ae

Description		Floor Area ft²	SPACE Peak Time Mo/Hr	SPACE OA Cond. DB/WB °F		SPACE Room Dry Bulb °F	SPACE Supply Dry Bulb °F	SPACE Space Air Flow cfm	SPACE Space Sensible Load Btu/h	COIL Peak Time Mo/Hr	COIL OA Cond. DB/WB °F		COIL Supply Dry Bulb °F	COIL Coil Air Flow cfm	COIL Coil Sensible Load Btu/h
Bldg 1 - NE Apartments	Rm/Zn Tot	2,745	13 / 1	10	6	68	72.2	2,849	-13,072	13 / 1	10	6	72.2	2,849	-13,072
Bldg 1 - SE Apartment	Rm/Zn Tot	2,745	13 / 1	10	6	68	72.2	2,839	-13,072	13 / 1	10	6	72.2	2,839	-13,072
Bldg 1 - SW Apartment	Rm/Zn Tot	1,830	13 / 1	10	6	68	71.4	2,469	-9,342	13 / 1	10	6	71.4	2,469	-9,342
Bldg 1 - NW Apartments	Rm/Zn Tot	1,830	13 / 1	10	6	68	71.5	2,427	-9,342	13 / 1	10	6	71.5	2,427	-9,342
Bldg 1 - 2nd SW Apt	Rm/Zn Tot	776	13 / 1	10	6	68	71.6	1,226	-4,892	13 / 1	10	6	71.6	1,226	-4,892
Bldg 1 - 2nd NW Apt	Rm/Zn Tot	776	13 / 1	10	6	68	71.8	1,218	-5,142	13 / 1	10	6	71.8	1,218	-5,142
Bldg 2 - NE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	74.6	2,096	-15,175	13 / 1	10	6	74.6	2,096	-15,175
Bldg 2 - SE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	71.2	3,412	-11,840	13 / 1	10	6	71.2	3,412	-11,840
Bldg 2 - SW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	70.6	3,216	-9,196	13 / 1	10	6	70.6	3,216	-9,196
Bldg 2 - NW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	73.3	1,994	-11,649	13 / 1	10	6	73.3	1,994	-11,649
Bldg 3 - NW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	73.3	2,592	-15,175	13 / 1	10	6	73.3	2,592	-15,175
Bldg 3 - NE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	73.6	1,888	-11,649	13 / 1	10	6	73.6	1,888	-11,649
Bldg 3 - SE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	70.6	3,259	-9,196	13 / 1	10	6	70.6	3,259	-9,196
Bldg 3 - SW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	71.1	3,423	-11,840	13 / 1	10	6	71.1	3,423	-11,840
Bldg 5 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,988	-11,840	13 / 1	10	6	73.4	1,988	-11,840
Bldg 5 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.8	1,449	-9,196	13 / 1	10	6	73.8	1,449	-9,196
Bldg 5 - SE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	70.4	4,330	-11,649	13 / 1	10	6	70.4	4,330	-11,649
Bldg 5 - SW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	71.0	4,536	-15,175	13 / 1	10	6	71.0	4,536	-15,175
Bldg 6 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	74.7	1,599	-11,840	13 / 1	10	6	74.7	1,599	-11,840
Bldg 6 - SE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	71.0	4,534	-15,175	13 / 1	10	6	71.0	4,534	-15,175
Bldg 6 - SW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	70.5	4,273	-11,649	13 / 1	10	6	70.5	4,273	-11,649
Bldg 6 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,538	-9,196	13 / 1	10	6	73.4	1,538	-9,196
Bldg 7 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,988	-11,840	13 / 1	10	6	73.4	1,988	-11,840
Bldg 7 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.8	1,449	-9,196	13 / 1	10	6	73.8	1,449	-9,196
Bldg 7 - SE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	70.4	4,330	-11,649	13 / 1	10	6	70.4	4,330	-11,649
Bldg 7 - SW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	71.0	4,536	-15,175	13 / 1	10	6	71.0	4,536	-15,175
Bldg 8 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	74.7	1,599	-11,840	13 / 1	10	6	74.7	1,599	-11,840
Bldg 8 - SE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	71.0	4,534	-15,175	13 / 1	10	6	71.0	4,534	-15,175
Bldg 8 - SW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	70.5	4,273	-11,649	13 / 1	10	6	70.5	4,273	-11,649
Bldg 8 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,538	-9,196	13 / 1	10	6	73.4	1,538	-9,196
Bldg 9 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,988	-11,840	13 / 1	10	6	73.4	1,988	-11,840
Bldg 9 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.8	1,449	-9,196	13 / 1	10	6	73.8	1,449	-9,196

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Peak Htg Loads Main System report page 1

PEAK HEATING LOADS
MAIN SYSTEM
By ae

Description		Floor Area ft²	SPACE Peak Time Mo/Hr	SPACE OA Cond. DB/WB °F		SPACE Room Dry Bulb °F	SPACE Supply Dry Bulb °F	SPACE Space Air Flow cfm	SPACE Space Sensible Load Btu/h	COIL Peak Time Mo/Hr	COIL OA Cond. DB/WB °F		COIL Supply Dry Bulb °F	COIL Coil Air Flow cfm	COIL Coil Sensible Load Btu/h
Bldg 9 - SE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	70.4	4,330	-11,649	13 / 1	10	6	70.4	4,330	-11,649
Bldg 9 - SW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	71.0	4,536	-15,175	13 / 1	10	6	71.0	4,536	-15,175
Bldg 10 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	74.7	1,599	-11,840	13 / 1	10	6	74.7	1,599	-11,840
Bldg 10 - SE Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	71.0	4,534	-15,175	13 / 1	10	6	71.0	4,534	-15,175
Bldg 10 - SW Apt	Rm/Zn Tot	3,572	13 / 1	10	6	68	70.5	4,273	-11,649	13 / 1	10	6	70.5	4,273	-11,649
Bldg 10 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,536	-9,196	13 / 1	10	6	73.4	1,536	-9,196
Bldg 4 - NE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	74.7	1,599	-11,840	13 / 1	10	6	74.7	1,599	-11,840
Bldg 4 - SE Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	71.2	3,412	-11,840	13 / 1	10	6	71.2	3,412	-11,840
Bldg 4 - NW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	73.4	1,988	-11,840	13 / 1	10	6	73.4	1,988	-11,840
Bldg 4 - SW Apt	Rm/Zn Tot	2,679	13 / 1	10	6	68	71.1	3,423	-11,840	13 / 1	10	6	71.1	3,423	-11,840
Terminal A/C	Sys Tot/Ave	121,434		10	6	68	71.7	118,078	-485,106		10	6	71.7	118,078	-485,106
Terminal A/C	Sys Block	121,434	13 / 1	10	6	68	71.7	118,078	-485,106	13 / 1	10	6	71.7	118,078	-485,106
Bldg 1 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	74	-5,266	13 / 1	10	6	125.0	74	-5,266
Bldg 2 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 3 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 4 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	81	-5,769	13 / 1	10	6	125.0	81	-5,769
Bldg 5 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 6 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 7 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 8 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 9 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Bldg 10 - Stairs	Rm/Zn Tot	333	13 / 1	10	6	60	125.0	93	-6,671	13 / 1	10	6	125.0	93	-6,671
Heating only	Sys Tot/Ave	3,330		10	6	60	125.0	901	-64,400		10	6	125.0	901	-64,400
Heating only	Sys Block	3,330	13 / 1	10	6	60	125.0	901	-64,400	13 / 1	10	6	125.0	901	-64,400
Bldg 1 - Game/TV	Rm/Zn Tot	1,123	13 / 1	10	6	68	69.2	1,225	-1,662	13 / 1	10	6	69.2	1,225	-11,225
Bldg 1 - Office/Reception	Rm/Zn Tot	281	13 / 1	10	6	68	71.6	328	-1,312	13 / 1	10	6	71.6	328	-5,137
Bldg 1 - Group Meeting	Rm/Zn Tot	633	13 / 1	10	6	68	68.0	444	1,616	13 / 1	10	6	68.0	444	-7,650
Bldg 1 - Conference	Rm/Zn Tot	175	13 / 1	10	6	68	68.0	129	2,093	13 / 1	10	6	68.0	129	-7,650
Bldg 1 - Office - C009	Rm/Zn Tot	281	13 / 1	10	6	68	68.0	86	1,214	13 / 1	10	6	68.0	86	-2,869
Bldg 1 - File/Closet	Rm/Zn Tot	145	13 / 1	10	6	68	80.5	49	-677	13 / 1	10	6	80.5	49	-677
Bldg 1 - Cyber Lounge	Rm/Zn Tot	653	13 / 1	10	6	68	68.0	1,225	1,462	13 / 1	10	6	68.0	1,225	-9,563
Bldg 1 - Corridor/Bathroom	Rm/Zn Tot	280	13 / 1	10	6	68	68.0	1,225	478	13 / 1	10	6	68.0	1,225	0

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Peak Htg Loads Main System report page 2

PEAK HEATING LOADS
MAIN SYSTEM
By ae

Description		Floor Area ft²	SPACE Peak Time Mo/Hr	SPACE OA Cond. DB/WB °F		SPACE Room Dry Bulb °F	SPACE Supply Dry Bulb °F	SPACE Space Air Flow cfm	SPACE Space Sensible Load Btu/h	COIL Peak Time Mo/Hr	COIL OA Cond. DB/WB °F		COIL Supply Dry Bulb °F	COIL Coil Air Flow cfm	COIL Coil Sensible Load Btu/h
Bldg 1 - Fitness	Rm/Zn Tot	212	13 / 1	10	6	68	68.0	1,225	1,282	13 / 1	10	6	68.0	1,225	-6,057
Commons	Sys Tot/Ave	3,783		10	6	68	68.6	5,936	4,495		10	6	68.6	5,936	-50,828
Commons	Sys Block	3,783	13 / 1	10	6	68	68.0	5,936	0	13 / 1	10	6	68.0	5,936	-47,178

Load / Airflow Summary

By ae

Description **		Floor Area ft²	People #	Coil Cooling Sensible Btu/h	Coil Cooling Total Btu/h	Space Design Max SA cfm	Air Changes ach/hr	VAV Minimum SA cfm	Main Coil Heating Sensible Btu/h	Heating Fan Max SA cfm	Percent OA Clg	Percent OA Htg	ASHRAE 62-89 OA fraction
Bldg 1 - NE Apartments	Rm/Zn Tot	2,745	12.0	50,824	56,126	2,849	6.56	0	-13,072	2,849	0.0	0.0	
Bldg 1 - SE Apartment	Rm/Zn Tot	2,745	12.0	50,680	55,982	2,839	6.53	0	-13,072	2,839	0.0	0.0	
Bldg 1 - SW Apartment	Rm/Zn Tot	1,830	8.0	41,704	45,048	2,469	8.52	0	-9,342	2,469	0.0	0.0	
Bldg 1 - NW Apartments	Rm/Zn Tot	1,830	8.0	41,114	44,458	2,427	8.38	0	-9,342	2,427	0.0	0.0	
Bldg 1 - 2nd SW Apt	Rm/Zn Tot	776	3.0	20,051	21,390	1,226	9.98	0	-4,892	1,226	0.0	0.0	
Bldg 1 - 2nd NW Apt	Rm/Zn Tot	776	2.0	19,519	20,659	1,218	9.91	0	-5,142	1,218	0.0	0.0	
Bldg 2 - NE Apt	Rm/Zn Tot	3,572	16.0	42,867	50,313	2,096	3.71	0	-15,175	2,096	0.0	0.0	
Bldg 2 - SE Apt	Rm/Zn Tot	2,679	12.0	53,020	55,447	3,412	8.04	0	-11,840	3,412	0.0	0.0	
Bldg 2 - SW Apt	Rm/Zn Tot	2,679	12.0	50,341	52,769	3,216	7.56	0	-9,196	3,216	0.0	0.0	
Bldg 2 - NW Apt	Rm/Zn Tot	3,572	16.0	39,795	47,322	1,994	3.53	0	-11,649	1,994	0.0	0.0	
Bldg 3 - NW Apt	Rm/Zn Tot	3,572	16.0	49,271	55,882	2,592	4.56	0	-15,175	2,592	0.0	0.0	
Bldg 3 - NE Apt	Rm/Zn Tot	3,572	16.0	39,724	47,252	1,888	3.34	0	-11,649	1,888	0.0	0.0	
Bldg 3 - SE Apt	Rm/Zn Tot	2,679	12.0	50,923	53,350	3,259	7.68	0	-9,196	3,259	0.0	0.0	
Bldg 3 - SW Apt	Rm/Zn Tot	2,679	12.0	53,166	55,590	3,423	8.07	0	-11,840	3,423	0.0	0.0	
Bldg 5 - NW Apt	Rm/Zn Tot	2,679	12.0	37,612	42,570	1,988	4.69	0	-11,840	1,988	0.0	0.0	
Bldg 5 - NE Apt	Rm/Zn Tot	2,679	12.0	30,326	35,972	1,449	3.42	0	-9,196	1,449	0.0	0.0	
Bldg 5 - SE Apt	Rm/Zn Tot	3,572	16.0	67,691	70,928	4,330	7.66	0	-11,649	4,330	0.0	0.0	
Bldg 5 - SW Apt	Rm/Zn Tot	3,572	16.0	70,538	73,771	4,538	8.02	0	-15,175	4,538	0.0	0.0	
Bldg 6 - NE Apt	Rm/Zn Tot	2,679	12.0	32,586	38,170	1,599	3.77	0	-11,840	1,599	0.0	0.0	
Bldg 6 - SE Apt	Rm/Zn Tot	3,572	16.0	70,487	73,724	4,534	8.02	0	-15,175	4,534	0.0	0.0	
Bldg 6 - SW Apt	Rm/Zn Tot	3,572	16.0	66,916	70,152	4,273	7.56	0	-11,649	4,273	0.0	0.0	
Bldg 6 - NW Apt	Rm/Zn Tot	2,679	12.0	30,379	36,025	1,538	3.63	0	-9,196	1,538	0.0	0.0	
Bldg 7 - NW Apt	Rm/Zn Tot	2,679	12.0	37,612	42,570	1,988	4.69	0	-11,840	1,988	0.0	0.0	
Bldg 7 - NE Apt	Rm/Zn Tot	2,679	12.0	30,326	35,972	1,449	3.42	0	-9,196	1,449	0.0	0.0	
Bldg 7 - SE Apt	Rm/Zn Tot	3,572	16.0	67,691	70,928	4,330	7.66	0	-11,649	4,330	0.0	0.0	
Bldg 7 - SW Apt	Rm/Zn Tot	3,572	16.0	70,538	73,771	4,538	8.02	0	-15,175	4,538	0.0	0.0	
Bldg 8 - NE Apt	Rm/Zn Tot	2,679	12.0	32,586	38,170	1,599	3.77	0	-11,840	1,599	0.0	0.0	
Bldg 8 - SE Apt	Rm/Zn Tot	3,572	16.0	70,487	73,724	4,534	8.02	0	-15,175	4,534	0.0	0.0	
Bldg 8 - SW Apt	Rm/Zn Tot	3,572	16.0	66,916	70,152	4,273	7.56	0	-11,649	4,273	0.0	0.0	
Bldg 8 - NW Apt	Rm/Zn Tot	2,679	12.0	30,379	36,025	1,538	3.63	0	-9,196	1,538	0.0	0.0	
Bldg 9 - NW Apt	Rm/Zn Tot	2,679	12.0	37,612	42,570	1,988	4.69	0	-11,840	1,988	0.0	0.0	

** This report does not display heating only systems.

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Load/Airflow Summary report page 1

Load / Airflow Summary

By ae

Description **		Floor Area ft²	People #	Coil Cooling Sensible Btu/h	Coil Cooling Total Btu/h	Space Design Max SA cfm	Air Changes ach/hr	VAV Minimum SA cfm	Main Coil Heating Sensible Btu/h	Heating Fan Max SA cfm	Percent OA Clg	Percent OA Htg	ASHRAE 62-89 OA fraction
Bldg 9 - NE Apt	Rm/Zn Tot	2,679	12.0	30,326	35,972	1,449	3.42	0	-9,196	1,449	0.0	0.0	
Bldg 9 - SE Apt	Rm/Zn Tot	3,572	16.0	67,691	70,928	4,330	7.66	0	-11,649	4,330	0.0	0.0	
Bldg 9 - SW Apt	Rm/Zn Tot	3,572	16.0	70,538	73,771	4,538	8.02	0	-15,175	4,538	0.0	0.0	
Bldg 10 - NE Apt	Rm/Zn Tot	2,679	12.0	32,586	38,170	1,599	3.77	0	-11,840	1,599	0.0	0.0	
Bldg 10 - SE Apt	Rm/Zn Tot	3,572	16.0	70,487	73,724	4,534	8.02	0	-15,175	4,534	0.0	0.0	
Bldg 10 - SW Apt	Rm/Zn Tot	3,572	16.0	66,916	70,152	4,273	7.56	0	-11,649	4,273	0.0	0.0	
Bldg 10 - NW Apt	Rm/Zn Tot	2,679	12.0	30,379	36,025	1,538	3.63	0	-9,196	1,538	0.0	0.0	
Bldg 4 - NE Apt	Rm/Zn Tot	2,679	12.0	32,586	38,170	1,599	3.77	0	-11,840	1,599	0.0	0.0	
Bldg 4 - SE Apt	Rm/Zn Tot	2,679	12.0	53,020	55,447	3,412	8.04	0	-11,840	3,412	0.0	0.0	
Bldg 4 - NW Apt	Rm/Zn Tot	2,679	12.0	37,612	42,570	1,988	4.69	0	-11,840	1,988	0.0	0.0	
Bldg 4 - SW Apt	Rm/Zn Tot	2,679	12.0	53,166	55,590	3,423	8.07	0	-11,840	3,423	0.0	0.0	
Terminal A/C	Sys Tot/Ave	121,434	541.0	1,998,987	2,177,296	118,078			-485,106	118,078	0.0	0.0	
Terminal A/C	Sys Block	121,434	541.0	1,670,615	1,923,345	118,078			-485,106	118,078	0.0	0.0	
Bldg 1 - Game/TV	Rm/Zn Tot	1,123	10.0	18,701	23,012	1,225	6.89	0	-11,225	1,225	12.2	12.2	
Bldg 1 - Office/Reception	Rm/Zn Tot	281	4.0	6,769	8,724	328	7.36	0	-5,137	328	18.3	18.3	
Bldg 1 - Group Meeting	Rm/Zn Tot	633	8.0	9,966	13,877	444	4.43	0	-7,650	444	27.0	27.0	
Bldg 1 - Conference	Rm/Zn Tot	175	8.0	4,787	7,704	129	4.65	0	-7,650	129	93.1	93.1	
Bldg 1 - Office - C009	Rm/Zn Tot	281	3.0	2,534	3,849	86	1.92	0	-2,869	86	52.6	52.6	
Bldg 1 - File/Closet	Rm/Zn Tot	145	0.0	593	593	49	2.15	0	-677	49	0.0	0.0	
Bldg 1 - Cyber Lounge	Rm/Zn Tot	653	10.0	12,273	14,950	1,225	11.85	0	-9,563	1,225	12.2	12.2	
Bldg 1 - Corridor/Bathroom	Rm/Zn Tot	280	0.0	956	956	1,225	27.63	0	0	1,225	0.0	0.0	
Bldg 1 - Fitness	Rm/Zn Tot	212	4.0	3,755	4,532	1,225	36.49	0	-6,057	1,225	7.8	7.8	
Commons	Sys Tot/Ave	3,783	47.0	57,959	75,820	5,936			-50,828	5,936	12.5	12.5	
Commons	Sys Block	3,783	47.0	56,637	73,618	5,936			-47,178	5,936	12.5	12.5	

** This report does not display heating only systems.

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Load/Airflow Summary report page 2

Appendix E

MONTHLY ENERGY CONSUMPTION

By ae

Alternative: 1 University Ridge

------- Monthly Energy Consumption -------

Utility	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Electric													
On-Pk Cons. (kWh)	61,646	55,288	72,480	69,062	82,871	88,862	84,584	94,726	78,781	77,104	69,513	60,591	895,507
Off-Pk Cons. (kWh)	83,482	75,260	79,528	83,862	89,152	88,251	108,611	91,561	91,389	84,425	80,879	86,920	1,043,321
On-Pk Demand (kW)	322	321	348	355	374	390	398	394	385	351	347	346	398
Off-Pk Demand (kW)	346	346	371	366	353	365	375	366	358	352	358	366	375
Gas													
On-Pk Cons. (therms)	64	59	20	4	0	0	0	0	0	4	10	40	201
Off-Pk Cons. (therms)	28	28	14	1	0	0	0	0	0	0	9	19	99
On-Pk Demand (therms/hr)	3	1	0	0	0	0	0	0	0	0	0	0	3
Off-Pk Demand (therms/hr)	5	1	0	0	0	0	0	0	0	0	0	1	5

Building Energy Consumption = 51,711 Btu/(ft2-year)
Source Energy Consumption = 154,693 Btu/(ft2-year)
Floor Area = 128,547 ft2

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Monthly Energy Consumption report page 1

ENERGY CONSUMPTION SUMMARY

By ae

	Elect Cons. (kWh)	Gas Cons. (therms)	Percent of Total Energy	Total Source Energy* (kBtu/yr)
Primary heating				
Primary heating	6,003.1	300.3	0.8 %	930.9
Primary cooling				
Cooling Compressor	313,170.7		16.1 %	32,068.8
Tower/Cond Fans	44,656.4		2.3 %	4,572.8
Condenser Pump			0.0 %	0.0
Other CLG Accessories	1,204.5		0.1 %	123.3
Cooling Subtotal....	359,031.5		18.4 %	36,764.9
Auxiliary				
Supply Fans			0.0 %	0.0
Circ Pumps	5,036.0		0.3 %	515.7
Base Utilities			0.0 %	0.0
Aux Subtotal....	5,036.0		0.3 %	515.7
Lighting				
Lighting	563,035.8		28.9 %	57,655.0
Receptacle				
Receptacles	1,005,722.6		51.6 %	102,986.2
Heating plant load				
Base Utilities			0.0 %	0.0
Cogeneration				
Cogeneration			0.0 %	0.0
Totals				
Totals**	1,936,828.9	300.3	100.0 %	196,852.7

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 6 utilities. If additional utilities are used, they will be included in the total.

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Alternative - 1 Energy Consumption Summary report page 1

MONTHLY UTILITY COSTS

By ae

Alternative: 1

Utility	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
					------- Monthly Utility Costs -------								
Electric													
On-Pk Cons. ($)	5,965	5,350	7,013	6,682	8,019	8,598	8,184	9,166	7,623	7,461	6,726	5,863	86,649
On-Pk Demand ($)	3,156	3,151	3,413	3,487	3,677	3,833	3,918	3,872	3,782	3,451	3,405	3,400	42,544
Total ($):	9,121	8,501	10,426	10,169	11,695	12,431	12,102	13,038	11,405	10,912	10,131	9,262	129,193
Gas													
On-Pk Cons. ($)	257	246	92	18	0	0	0	0	0	18	47	182	861
Monthly Total ($):	9,378	8,747	10,519	10,187	11,695	12,431	12,102	13,038	11,405	10,930	10,178	9,444	130,054

Project Name: University Ridge at East Stroudsburg
Dataset Name: C:\CDS\TRACE700\Projects\ESU-AQUATHERM.TRC

TRACE® 700 v4.1 calculated at 11:54 AM on 10/27/2006
Monthly Utility Costs report Page 1 of 1

TRACE® 700 Economic Summary

By ae

Project Information

Weather file	Allentown, Pennsylvania
Project Name	University Ridge at East Stroudsburg
Location	East Stroudsburg, PA
Building Owner	
User	Matthew Carr
Company	
Comments	

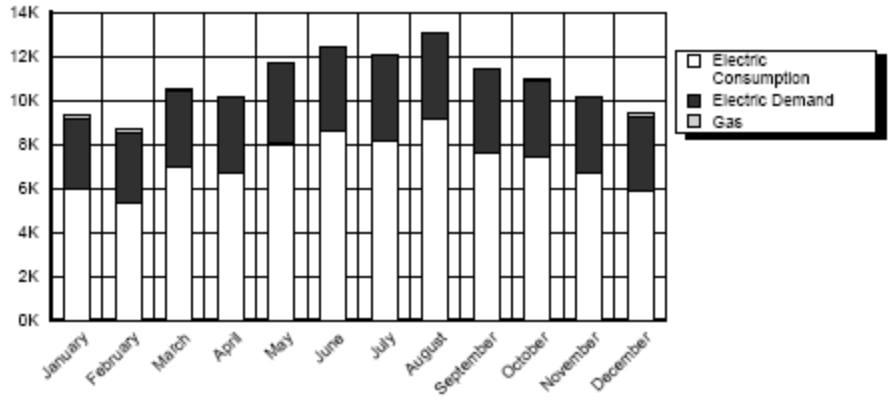
Alternative 1 - - University Ridge

Economic Summary

Alternative Number	Installed Cost	First Year Util.Cost	Final Year Util. Cost	First Year Maint. Cost	Final Year Maint. Cost	Life Cycle Cost
1	0.00	130053.89	130053.89	0.00	0.00	1107222.09

Monthly Utility Costs per Utility

(1 alternative)



Equipment Energy Consumption by Alternative

	Elect Cons. (kWh)	Gas Cons. (therms)	Percent of Total Energy	Total Source Energy* (kBtu/yr)
Alternative: 1 - University Ridge				
Primary heating	6,003.1	300.3	0.8%	930.9
Cooling Compressor	313,170.7		16.1%	32,058.8
Tower/Cond Fans	44,656.4		2.3%	4,572.8
Other CLG Accessories	1,204.5		0.1%	123.3
Circ Pumps	5,036.0		0.3%	515.7
Lighting	563,035.8		28.9%	57,655.0
Totals	**1,938,828.9**	**300.3**	**100.0%**	**198,852.7**

* *Note: Resource Utilization factors are included in the Total Source Energy value.*

References

1. ASHRAE. 2004. *ANSI/ASHRAE Standard 90.1-2004 – Energy Standard*. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.

2. LEED-NC Green Building Rating System: Version 2.2. United States Green Building Council, 2005.

3. TRANE TRACE 700 v 4.1.1 2001.