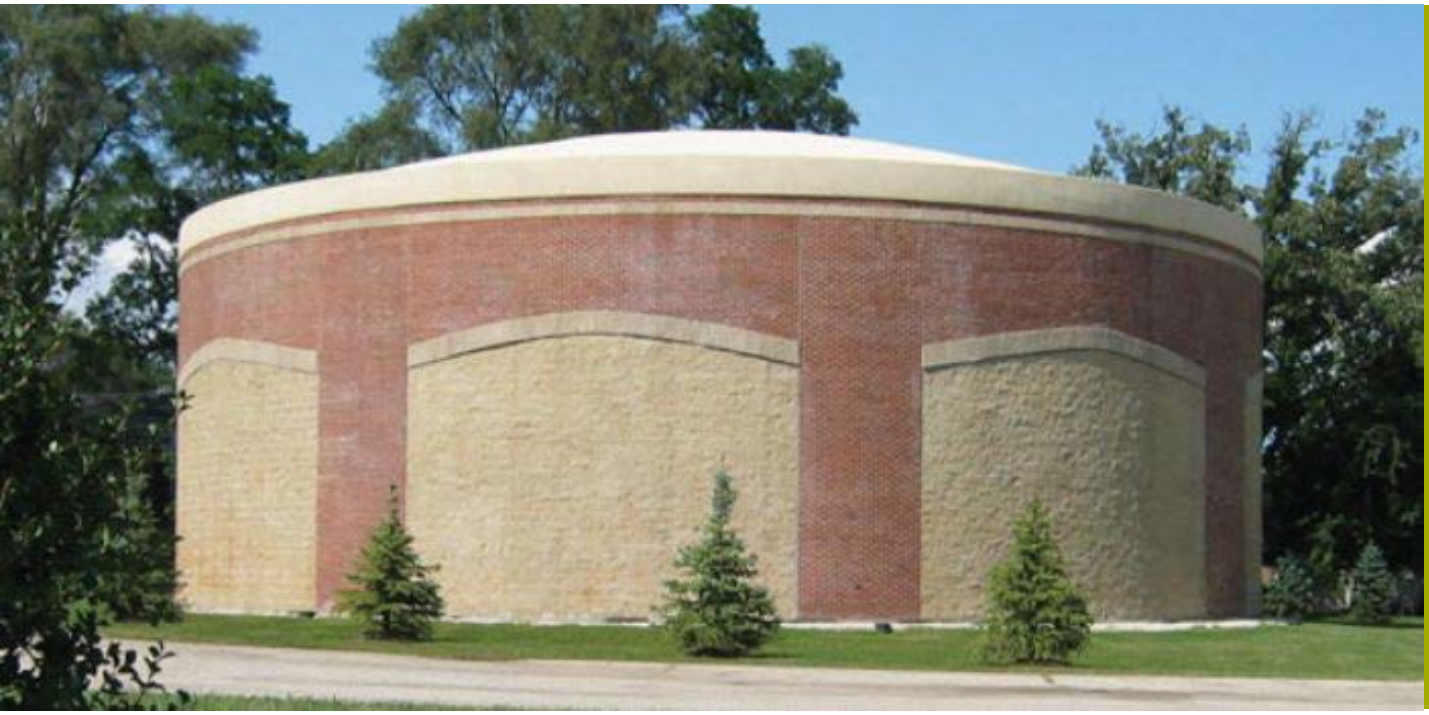
p2s

THE VISION TO CHANGE.
THE INTEGRITY TO SUSTAIN.



THE VISION TO CHANGE.
THE INTEGRITY TO SUSTAIN.

Mount San Antonio College
SCE Permanent Load Shifting Program Incentive

Account Number 3-000-2091-22
1100 N. Grand Avenue
Walnut, CA 91789

October 7, 2014

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Executive Summary

Mt San Antonio College has approximately 822,000 SF of buildings connected to the existing central plant and a future 828,000 SF to be added by 2025, for a total square footage of 1,650,000 SF to be connected to the College central plant. The existing central plant has one 500 ton absorption chiller, two 750 ton chillers and a primary variable chilled water system. A satellite plant in Building 2 also supports the chilled water system with two 250 tons chillers, configured in a primary / secondary variable pump system. Mt San Antonio College has reached a point in the operation of the central plant where expansion of the chilled water is required to service the total square footage of the College through 2025 and to maintain redundancy in the chilled water system. The existing central plant has physical capacity to fit another 750 ton chiller and pumps. Our office reviewed the option of adding another 750 ton chiller and the option of adding a chilled water thermal energy storage system. Through a partnership between our office and the College, we are proposing thermal energy storage and the installation of the 750 ton chiller option for the following reasons:

- The energy savings resulting from not running the existing chillers (and a third chiller) during peak demand periods is substantial.
- A significant incentive is available to offset first costs related to the installation of a thermal energy storage system.
- The flexibility in having a redundant source of chilled water in case of chiller failure or maintenance.

Through the analysis presented in this report, P2S Engineering Inc. recommends the installation of the 20,000 ton hour chilled water thermal energy tank at Mt San Antonio College. The College is currently on a fixed rate through SCE and Constellation. It is recommended for the College to change to a TOU-8 rate in 2016 on the contract is up for renewal in order to maximize the energy savings during peak demand periods, an estimated $323,000 for the first year. Also a 20 year life cycle cost analysis was performed as part of this report and a positive rate of return is expected after 12 years. The proposed 20,000 ton hour capacity in the thermal energy storage tank allows for future connection to the central plant chilled water system of the planned buildings as part of the master plan through 2025. Most importantly, the total tonnage offset during the summer peak operation hours is 2,311 tons. This equates to a $1,602,913 immediate incentive available once additional buildings currently under constructed are completed in 2016. These incentives will help offset the estimated $5.24M of first costs for the installation of a thermal energy storage system. It will also continue to save Mt San Antonio College money in maintenance and utility costs throughout the life of the central plant equipment.

Project Background

Mt San Antonio College has undergone extensive growth in facilities and upgrades within the last 10 years resulting in a total central plant connected square footage of 822,000. The College expects further build out of approximately 1,650,000 square feet over the next 10 years. A central plant was provided in 2003 to centralize all the chilled water supply for campus cooling for efficiency and equipment maintenance. Initially the central plant was designed with one (1) 500 ton absorption chiller and two (2) 750 ton centrifugal chillers, with a space for a third 750 ton centrifugal chiller to accommodate the future needs of the College. During the summer of 2014, a satellite central plant in Building 2 was connected to the College central plant chilled water loop with a total capacity of 500 tons to service the shoulder loads of the College.

In anticipation of the future loads resulting in almost double existing College cooling loads, an energy efficiency measure to provide chilled water to the various instructional buildings is required. Through a partnership, our office and the College opted for the thermal energy storage option for the following reasons:

1. The College is currently on a non-TOU rate schedule through SCE and Constellation through 2016. We are recommending herein changing the College rate schedule to TOU once contact is expired.
2. A significant incentive is available from SCE to offset first costs related to the installation of a thermal energy storage system.
3. The following are specific advantages to the College:
    - Efficient operation of the chillers during the night by operating them at higher efficiencies when the night temperatures are cooler.
    - Elimination of additional maintenance costs for added chillers and cooling towers to support the peak chilled water demand.
    - Reduce operating costs by generating chilled water at night when the demand charges are not applicable and the utility rates are lower compared to peak period rates (when TOU is applicable).
    - Help offset the peak demand charges of the College.
    - Help shield the College against future escalation in demand charges.
    - Efficient operation of the central plant at low loads.
    - Provide redundancy should a chiller fail during peak periods.
    - Addition of approximately 3,200 tons of additional chilled water capacity to the existing chiller plant to accommodate the cooling demands of the future buildings.

The following is the current Non-TOU schedule for the entire year at Mt SAC, fixed at $0.147/kWh:

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8am-12pm*	Mid Peak Energy Rate						
12pm-6 pm*	On-Peak Energy Rate						
6pm-11pm	Mid Peak Energy Rate						
11pm-8am	Off - Peak Energy Rate						

* Except holidays, holidays are considered off peak.

The actual SCE and Constellation College bills for the month of July can be found in Appendix A. These rates were utilized when taking into consideration the existing central plant operation.

The proposed location of the thermal energy storage tank is directly north of the existing central plant. Refer to Appendix B for site plan of College. The main central plant system will be changed from a primary variable to a primary/ secondary distribution system. The Building 2 satellite plant configuration will remain the same. The chillers are proposed to only operate during mid and off peak periods and to charge the tank at night during the summer months. It is expected that during the winter months, the thermal energy storage tank may be able to handle the full load of the College throughout its entire operating day.

The following is the proposed TOU-8 schedule for the summer season, June 1 to October 1.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8am-12pm*	Mid Peak Energy Rate						
12pm-6 pm*	On-Peak Energy Rate						
6pm-11pm	Mid Peak Energy Rate						
11pm-8am	Off - Peak Energy Rate						

* Except holidays, holidays are considered off peak.

The following is the proposed TOU-8 schedule for the winter season, October 1 to June 1.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8am-9pm*	Mid Peak Energy Rate						
9pm-8am	Off - Peak Energy Rate						

* Except Holidays, holidays are considered off peak.

The actual rate schedule can be found in Appendix A. These rates were utilized when taking into consideration the future central plant with TES operation.

Existing Central Plant

The existing central plant at Mt San Antonio College consists of one (1) 500 ton absorption chiller, two (2) 750 ton chillers, and distribution pumps that operate in a variable primary design via one (1) chilled water pump and one (1) standby pump. The absorption chiller assists in precooling the CHWR temperature before it returns to CH-2 and CH-3. There are two (2) cooling towers with variable speed fans located directly south of the central plant building that distribute condenser water to chillers via three (3) condenser water pumps and one (1) standby pump. This past year, the Building 2 satellite chiller plant was added to the chilled water loop to provide additional cooling to the College. It consists of two (2) 250 ton chillers and operates in a primary / secondary variable configuration design via two (2) chilled water pumps and one (1) standby chilled water pump. There is one (1) cooling tower with two (2) variable speed fans that distribute condenser water to the chillers via one (1) condenser water pump and one (1) standby pump. Both central plants are on an energy management system.

The following is a list of all central plant equipment:

CHILLERS	TONS	KW/TON
CH-1 (ABS)	500	
CH-2	750	0.6
CH-3	750	0.6
CH-1 (BLDG 2)	250	0.6
CH-1 (BLDG 2)	250	0.6

COOLING TOWERS	FAN HP	VARIABLE OR CONSTANT
CT-1	40	VARIABLE
CT-2	40	VARIABLE
CT-1 (BLDG. 2)	(2) -15	VARIABLE

CHWP	PUMP HP	PUMP HD	VARIABLE OR CONSTANT
CHWP-1	200	228	VARIABLE
CHWP-2	200	228	VARIABLE
CHWP-1 (BLDG. 2)	20	65	CONSTANT
CHWP-2 (BLDG. 2)	20	65	CONSTANT
CHWP-3 (BLDG. 2)	30	100	VARIABLE
CWHP-4 (BLDG. 2)	30	100	VARIABLE
CWP	**PUMP HP**	**PUMP HD**	**VARIABLE OR CONSTANT**
CWP-1	60	30	CONSTANT
CWP-2	60	30	CONSTANT
CWP-3	60	30	CONSTANT
CWP-4	60	30	CONSTANT
CWP-1 (BLDG. 2)	40	15	CONSTANT
CWP-2 (BLDG. 2)	40	15	CONSTANT

There are various HVAC designs in each of the buildings connected to the central plant. Most of the HVAC systems are new or have been renovated to variable air volume systems. A total of approximately 822,000 SF of conditioned area is currently connected to the central plant for chilled water and are on College energy management system. Refer to Appendix C for a list of buildings and the Trace outputs of the typical peak profile day per month for the College.

The College's 2013-2014 academic calendars were incorporated into the study, along with standard schedules of each building. Generally, the College operates from 8am-10pm Monday through Friday. Many classes are off for lunch between noon and 1pm during this period. The existing central plant starts at 7am and is available until 10pm. The electric centrifugal chillers are off between 10pm and 7am; however, the absorption chiller continues to operate through the night.

All of the buildings connected to the central plant were modeled in Trane Trace. This included envelope loads, internal loads such as lighting and power, people, and operating schedules.

The following is HVAC peak block tonnage breakdown per building based on the Trane Trace model for the current buildings connected to the central plant without diversity:

NO.	BUILDING	SQUARE FOOTAGE	PEAK BLOCK TONNAGE
1A	Art Center	16,700	60
1B/C	Art StudioCenter	16,136	74
2B	Fedderson Recital Hall	63,361	193
4	Administration	41,963	113
6	Learning Technology Center	101,784	250
7	Science South	37,226	298
9B	Student Services	51,369	118
11	Science North	18,939	107
12	Building 12	13,000	50
13	Design Technology Center	62,000	162
26	Humianities/Social Sciences	98,230	359
29	Central Plant	148	1
60	Science	62,982	249
61	Math and Science	64,139	211
66	Language Center	43,911	123
67A	Health Careers	31,768	90
67B	Student Health	10,995	33
70-73	Childhood Development	36,012	99
80	Agricultural Science Building	51,100	214
	TOTALS	821,583	2,801

The following is HVAC peak block tonnage breakdown per building based upon the Trane Trace model for the additional buildings to be connected to the central plant by the end of 2016:

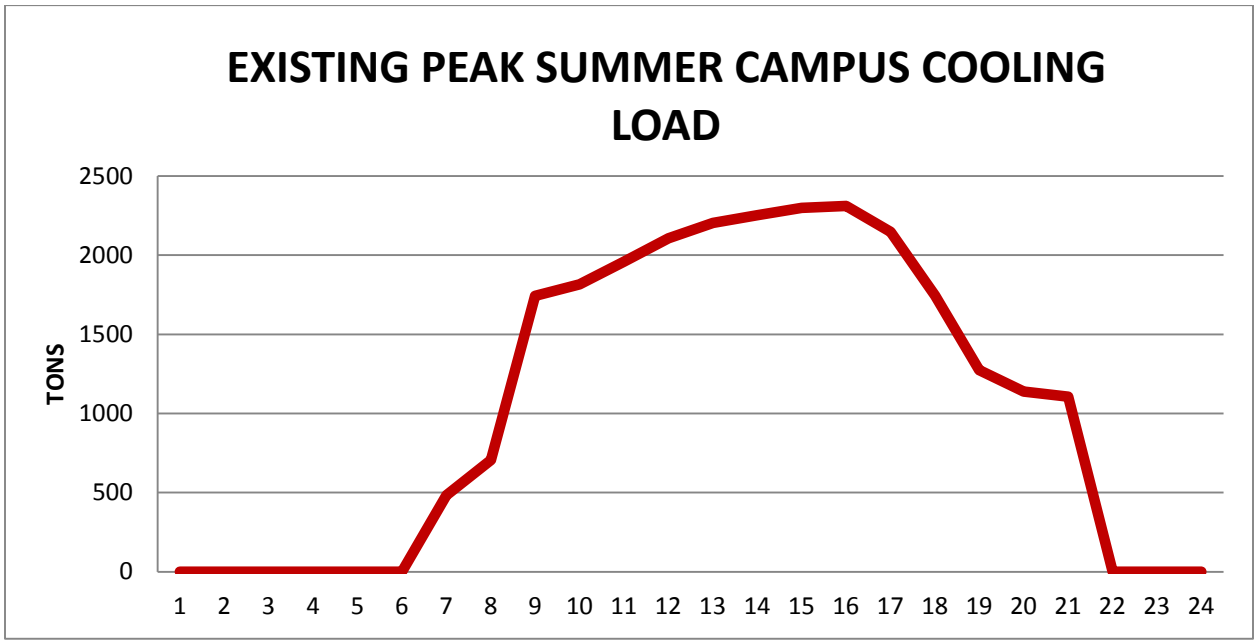
NO.	BUILDING	SQUARE FOOTAGE	PEAK BLOCK TONNAGE
9A	Food Services	12,000	52
9B Add	Student Support Services	16,056	53
	Business Technology	87,000	365
	TOTALS	115,056	470

The following is the HVAC peak tonnage breakdown per buildings estimated for the full build out by 2025. The buildings will be divided into 2 phases. 400 SF/ton was utilized for peak load estimation.

BUILDING	SQUARE FOOTAGE	PEAK BLOCK TONNAGE
PHASE 1		
Athletics Phase 1	45,000	240
Library/Campus Center	217,200	543
Classroom Building	101,400	254
Language Lab Expansion	15,000	38
Building 9A Renovation	21,300	53
Continuing Education	24,440	61
Athlectics Phase 2	50,000	260
PHASE 2		
Instructional Building	50,000	125
Auditorium Zone	12,000	30
Instructional Building	75,000	188
Instructional Building	100,000	250
TOTALS	711,340	2,042

Trended information from both chiller plants was requested to review actual load profiles and diversity specific to Mt SAC. Per the College trends provide to our office, cooling demands peaked on September 15, 2014 at 3:00 pm at 2,311 tons. Outside air temperature was recorded at 102 deg F. This reflects an 83% diversity on campus during a peak period when compared to the calculated summarized Trance Trace peak block tonnage of the College.

The following is the peak cooling load profile of the peak day (September 15, 2014) at Mt San Antonio College per the trends:



Existing Central Plant Electric Loads

The central plant operation and load profiles were modeled to establish baseline electric load consumption based upon the building HVAC loads as listed previously. Below is the calculated central plant energy consumption supporting the current HVAC loads on campus. Refer to Appendix D for electric loads profiles modeled for the College.

	Total Existing Annual Load	Existing Summer Load (June 1 through October 1)	Existing Winter Load (October 1 through June 1)
On Peak (kWh)	882,211	882,211	0
Mid Peak (kWh)	2,330,606	820,611	1,509,995
Off Peak (kWh)	137,058	30,992	106,066
On Peak Demand (KW)	1,786	1,786	0

Thermal Energy Storage Options

Two options for energy storage were reviewed with the College; water storage and ice storage. The following are reasons why thermal energy water storage was recommended over the ice storage:

- The existing chillers can be utilized for charging the thermal energy storage tank without having to add a glycol chiller to charge an ice storage system.
- Generating low temperature glycol to make ice requires more compressor energy (0.9 kw/ton) than the existing chillers (0.7 kw/ton).
- Additional equipment (besides glycol chiller) is required for an ice storage system such as dedicated pumps, a plate and frame heat exchanger, a glycol loop, etc. This would require additional maintenance budget and expertise.
- There is increased complexity in the control strategy for ice storage as compared to the thermal energy storage tank.
- The College has the footprint available north of the central plant for the placement of thermal energy storage tank.

The thermal energy storage tank is assumed to operate over 6 hours of depletion during peak periods. 2,311 peak tons over 6 hours equates to 13,866 ton hours of required capacity. This is adequate chilled water for the existing buildings connected to central plant during a depletion time frame of over 6 hours. Currently the central plant with an installed capacity of about 2,300 tons (with absorption chiller) struggles to maintain chilled water supply to its buildings during peak periods.

There are still some buildings not connected to central plant and their future connection timeframe is unknown at this time. From our experience, community colleges in general experience about a 65% diversity factor in terms of building usage during peak periods. By the end of 2015, the connected load will include an additional 306 tons (470 tons x 65% diversity) resulting in to an additional 1,836 ton hours 15,702 ton hours required. Considering the additional cooling load requirements through 2025, a capacity of 20,000 ton hours is proposed for Mt San Antonio College. It is assumed that the buildings constructed between 2015 and 2025 will be more efficient, thus the assumption of 400 sf/ton will is conservative.

For the SCE incentive consideration, 2,311 tons will be considered as the total tons offset during the summer. In the past SCE has allowed demonstration of future loads with the year for additional incentive. Since current projects are under construction and expected to be completed by end of 2015, an additional 306 tons will be requested for consideration in the incentive.

The thermal energy storage tank will be located directly north of the central plant. An additional 750 ton water cooled chiller is proposed to be located in the central plant to assist with charging the tank at night and provide chiller redundancy. The existing primary pumps will be utilized as secondary pumps, and new primary pumps will be added. Refer to Appendix B for system schedules, control schematic, and TES concept level site plan.

The proposed typical operation of the central plant is as follows during peak Summer College operating hours (with new CH-4 installed):

	8am	9am	10 am	11 am	12 pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10 pm
CH-2			X	X								X	X	X	
CH-3			X	X								X	X		
CH-4				X								X			
CH-1 (BLDG 2)	X	X													
CH-2 (BLDG 2)		X													
TES					X	X	X	X	X	X	X				

The proposed typical operation of the central plant is as follows night peak charging period (with new CH-4 installed):

	11pm	12am	1am	2am	3am	4am	5am	6am	7am
CH-2	X	X	X	X	X	X	X	X	X
CH-3	X	X	X	X	X	X	X	X	X
CH-4	X	X	X	X	X	X	X	X	X
CH-1 (BLDG 2)									
CH-2 (BLDG 2)									
TES									

The advantages of the proposed Thermal Energy Storage System are as follows:

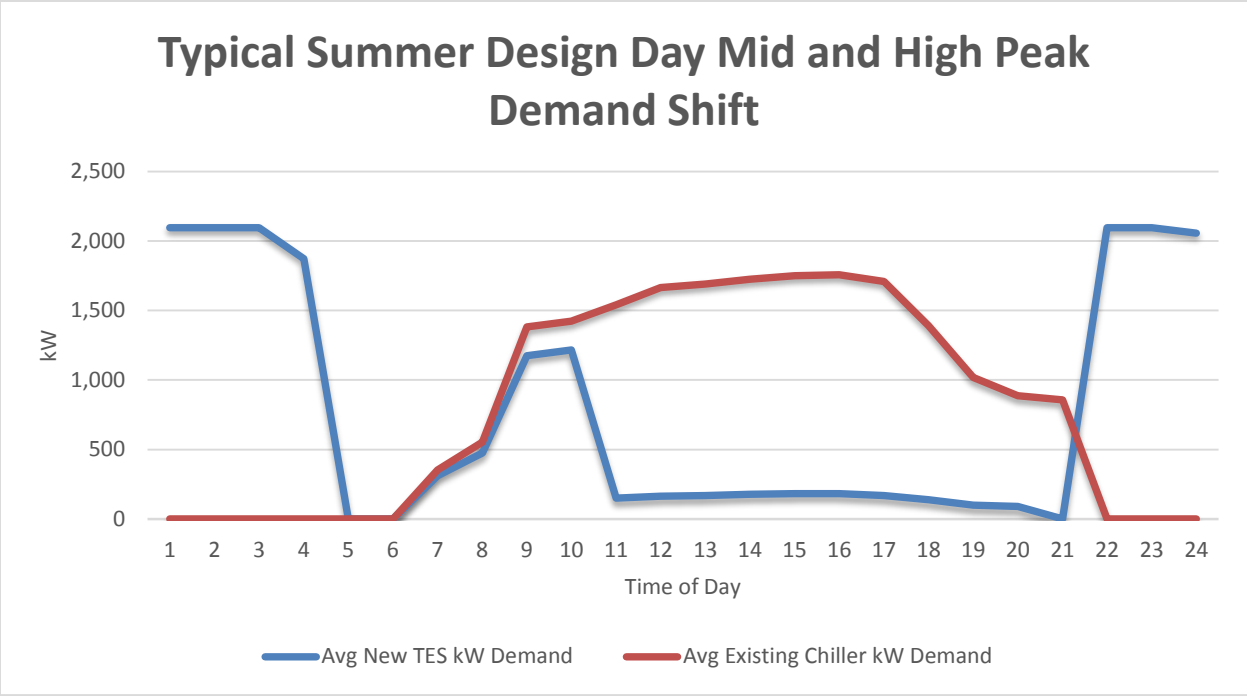
1. Efficient operation of the chillers during the night by operating them at higher efficiencies when the night temperatures are cooler.
2. Elimination of additional maintenance costs for added chillers and cooling towers to support the peak chilled water demand.
3. Reduce operating costs by generating chilled water at night when the demand charges are not applicable and the utility rates are lower compared to peak period rates (when TOU-8 is applicable).
4. Help offset the peak demand charges of the College.
5. Help shield the College against future escalation in demand charges.
6. Efficient operation of the central plant at low loads.
7. Provide redundancy should a chiller fail during peak periods.
8. Addition of approximately 3,200 tons of additional chilled water capacity to the existing chiller plant to accommodate the cooling demands of the future buildings.

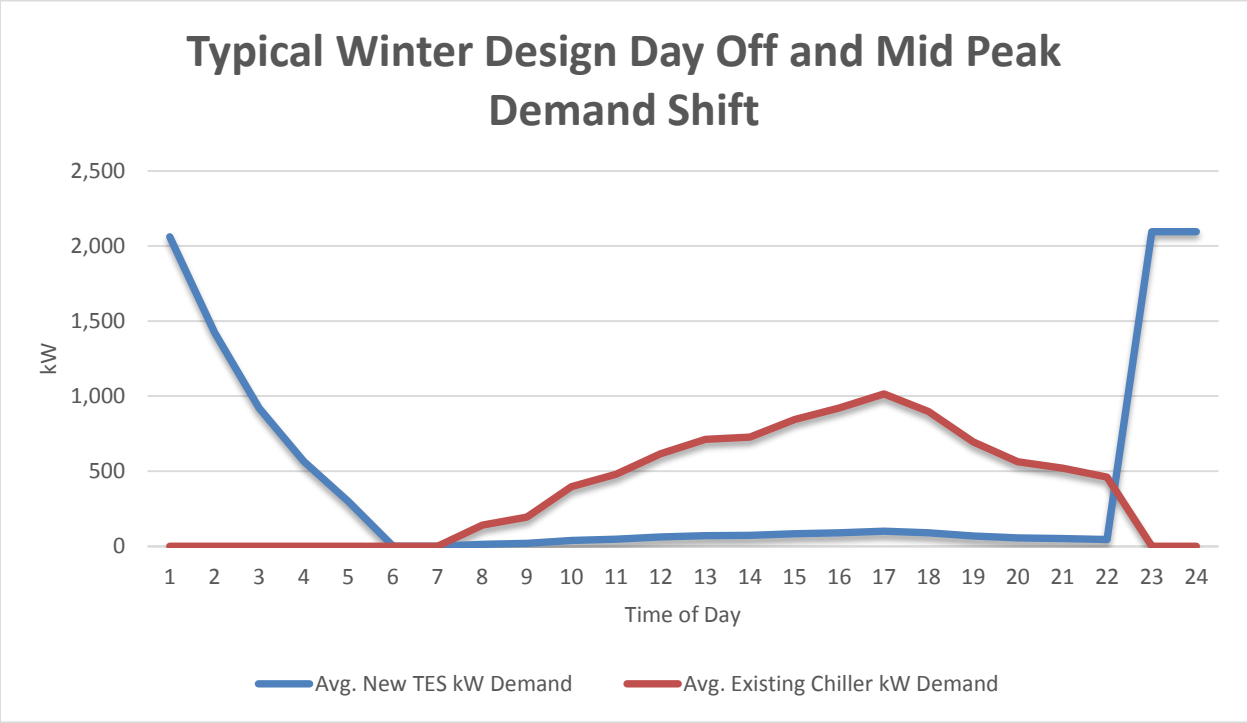
Estimated Demand Reduction and Energy Use

As stated herein the thermal energy storage tank would deplete between the hours of noon until 6pm during normal College operating hours. Below is an estimate of demand reduction and energy usage of the proposed operation of the central plant with TES.

	TES Annual Load	TES Summer Load (June 1 through October 1)	TES Winter Load (October 1 through June 1)
On Peak (kWh)	89,741	89,741	0
Mid Peak (kWh)	814,969	665,414	149,555
Off Peak (kWh)	2,601,863	926,115	1,675,748
On Peak Demand (KW)	191	191	0

The following is a breakdown of the energy usage savings graphically.





Energy Efficiency Information

The summer on, mid, and off peak periods, winter mid and off peak periods, and demand charges were considered as part of the energy analysis for this College. Appendix D can be referred to for the breakdown in costs for each period, below is the savings as calculated per year.

	Existing Annual Consumption	TES Annual Consumption with TOU Rate	Annual Savings
Summer On Peak (kWh)	$125,891.52	$9,438.94	$116,452.59
Summer Mid Peak (kWh)	$117,101.16	$55,708.46	$61,392.69
Summer Off Peak (kWh)	$4,422.49	$54,708.46	($49,653.37)
Winter Mid Peak (kWh)	$215,476.30	$11,732.60	$203,743.69
Winter Off Peak (kWh)	$15,135.66	$91,009.85	($75,874.19)
Summer On Peak Demand (KW)	$24,488.19	$3,552.47	$20,935.72
Summer Mid Peak Demand (KW)	$24,406.75	$917.93	$23,488.82
Summer Facility Related Demand (KW)	$24,488.19	$2,347.34	$22,140.85
Total	**$551,410.26**	**$228,783.45**	**$322,626.82**

The annual operating savings is approximately $323,000 per year. This is based upon the SCE TOU-8 rate, campus load profiles, and existing and future equipment efficiencies.

If Mt. SAC decided to not change its electrical rate from the existing non-TOU rate in the future once the TES is installed, the following is the savings calculated per year:

	Existing Annual Consumption	TES Annual Consumption with Non-TOU Rate	Annual Savings
Summer On Peak (kWh)	$125,891.52	$12,806.01	$113,085.51
Summer Mid Peak (kWh)	$117,101.16	$94,954.59	$22,146.57
Summer Off Peak (kWh)	$4,422.49	$132,156.62	($127,734.13)
Winter Mid Peak (kWh)	$215,476.30	$21,341.53	$194,134.77
Winter Off Peak (kWh)	$15,135.66	$239,129.18	($223,996.51)
Summer On Peak Demand (KW)	$24,488.19	$2,614.30	$21,873,89
Summer Mid Peak Demand (KW)	$24,406.75	$2,410.88	$21,995.87
Summer Facility Related Demand (KW)	$24,488.19	$2,614.30	$21,873.89
Total	**$551,410.26**	**$508,027.39**	**$43,382.88**

It is highly recommended that Mt SAC changed from a non-TOU rate to a TOU as soon as the utility contract is up for renewal in order to maximize utility savings with the installation of the thermal energy storage system.

Operations and Maintenance

Thermal Energy Storage Tank

The maintenance of the tank would meet AWWA D100, the governing code for water storage tanks, including TES. It recommends that inspections are made every 3-5 years. Because the tank has no moving parts, visual inspections are all that are required with touch-up paint work as needed and recoats in accordance with paint manufacturer's recommendations.

Because the TES tanks have insulation on the outside, it is also recommended to visually inspect the insulation for any physical damage. Considering the environment/climate of Walnut, in the case of the Mt San Antonio College tank, there is little reason to suspect that the exterior paint is having any issues as long as the insulation paneling remains intact. The insulation protects the exterior paint from the elements. Visual inspection of the tank interior can be done by using a diver or some form of remote control camera, although this is rarely done. It is our understanding that the cool temperatures of the water inside the tank along with the chemical additives greatly increase the life of the internal coatings.

The concrete itself will theoretically last indefinitely as long as it remains protected. Therefore, the main concern when it comes to inspections revolve around the tank coatings. As long as the paint is in good condition, the concrete is in good condition. As noted above, as long as the insulation is in good condition, the exterior paint should be in good condition.

Chillers and Pumps

Currently the chillers and pumps are maintained by an independent contractor. The campus will continue to maintain the current maintenance plan for the existing chiller, the new chiller, and new pumps. This would not be an added cost to the project once the thermal energy storage tank in constructed, as this maintenance plan is currently in place now.

It is our understanding the chillers are checked quarterly and annually. Pump motors are recommended to be inspected every 6 months. The Mt San Antonio pumps have seal bearings thus lubrication is not required.

The annual operating costs are minimal since the thermal energy storage tank has no moving parts. There is also a chiller and pump maintenance program in place for the existing chiller and pumps, therefore, this maintenance cost would be negligible when considering added costs of maintenance for the thermal energy storage tank installation. However, there is additional maintenance costs related to the additional 750 ton chiller installation, new pumps, and the additional water treatment. The estimated increase in delta costs annually for this maintenance is approximately $45,000.

Economic Analysis

The installation of the Mt San Antonio thermal energy storage system is estimated to be approximately $5,235,000. This includes all installation and equipment costs for the tank, the chiller, the pumps, structural, etc. A breakdown of estimated construction costs is included in Appendix E. The calculated incentive for this program is as follows:

Cooling Load Shift (tons)	Conversion Factor (kw/ton)	PLS Incentive per KW	Calculated Incentive
2,617	0.7	$875	$1,602,913

Below is a 20 year life cycle cost analysis considering a 3% escalation factor every year on the utility rates and 3% on the maintenance costs on the thermal energy storage tank, new chiller, new pumps, and additional water treatment:

Year	Construction Cost	Incentives	Annual Energy Savings	Delta Maintenance Costs	Year End Costs
1	($5,235,000)	$1,602,913	$322,627	($45,000)	($3,354,461)
2	($3,354,461)		$332,306	($46,350)	($3,068,505)
3	($3,068,505)		$342,275	($47,741)	($2,773,971)
4	($2,773,971)		$352,543	($49,173)	($2,470,600)
5	($2,470,600)		$363,119	($50,648)	($2,158,129)
6	($2,158,129)		$374,013	($52,167)	($1,836,283)
7	($1,836,283)		$385,233	($53,732)	($1,504,783)
8	($1,504,783)		$396,790	($55,344)	($1,163,337)
9	($1,163,337)		$408,694	($57,005)	($811,647)
10	($811,647)		$420,955	($58,715)	($449,407)
11	($449,407)		$433,583	($60,476)	($76,300)
12	($76,300)		$446,591	($62,291)	$308,001
13	$0		$459,989	($64,159)	$395,829
14	$0		$473,788	($66,084)	$407,704
15	$0		$488,002	($68,067)	$419,935
16	$0		$502,642	($70,109)	$432,534
17	$0		$517,721	($72,212)	$445,510
18	$0		$533,253	($74,378)	$458,875
19	$0		$549,251	($76,609)	$472,641
20	$0		$565,728	($78,908)	$486,820

Recommendations

P2S Engineering Inc. recommends the installation of the 20,000 ton hour chilled water thermal energy tank at Mt San Antonio College for the following reasons:

1. Annual energy savings of approximately 2,300,000 kWh during mid and peak periods resulting in a first year energy savings of $323,000. This savings would incrementally increase every year.
2. The $1,602,903 incentive available by SCE to offset first costs related to the installation of a thermal energy storage system, after the 2016 buildings are connected,
3. The 20 year life cycle cost analysis and expected continued energy savings reflecting a positive rate of return after 12 years.
4. The thermal energy storage tank allows for flexibility in the chilled water system when considering maintenance of the existing chillers.
5. The maintenance as related to adding the thermal energy storage system is minimal as compared to expanding the central plant with only adding additional chillers or ice storage system. This is important in a community college setting.
6. The 20,000 ton hour capacity in the thermal energy storage tank allows for future connection to the central plant chilled water system once the remaining buildings are renovated.

Appendix A – Existing and Future Rate Schedules

Schedule TOU-8 Sheet 10
TIME-OF-USE - GENERAL SERVICE - LARGE

(Continued)

RATES (Continued)

SERVICE METERED AND DELIVERED AT VOLTAGES FROM 2 kV THROUGH 50 KV

	Delivery Service								Generation[9]	
Option B	Trans[1]	Distrbtn[2]	NSGC[3]	NDC[4]	PPPC[5]	DWRBC[6]	PUCRF[7]	Total[8]	URG*	DWREC[10]
Energy Charge - $/kWh/Meter/Month										
Summer Season - On-Peak	(0.00106)	0.00244 (I)	0.00156 (R)	0.00015 (I)	0.01043 (R)	0.00513	0.00024	0.01889 (R)	0.08629 (R)	(0.00463)
Mid-Peak	(0.00106)	0.00244 (I)	0.00156 (R)	0.00015 (I)	0.01043 (R)	0.00513	0.00024	0.01889 (R)	0.06483 (R)	(0.00463)
Off-Peak	(0.00106)	0.00244 (I)	0.00156 (R)	0.00015 (I)	0.01043 (R)	0.00513	0.00024	0.01889 (R)	0.03950 (R)	(0.00463)
Winter Season - On-Peak	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mid-Peak	(0.00106)	0.00244 (I)	0.00156 (R)	0.00015 (I)	0.01043 (R)	0.00513	0.00024	0.01889 (R)	0.05956 (R)	(0.00463)
Off-Peak	(0.00106)	0.00244 (I)	0.00156 (R)	0.00015 (I)	0.01043 (R)	0.00513	0.00024	0.01889 (R)	0.03542 (R)	(0.00463)
Customer Charge - $/Meter/Month		316.55 (I)						316.55 (I)		
Demand Charge - $/kW of Billing Demand/Meter/Month										
Facilities Related	2.84	9.47 (I)						12.31 (I)		
Time Related										
Summer Season - On-Peak		0.00						0.00	18.63 (R)	
Mid-Peak		0.00						0.00	5.22 (R)	
Winter Season - Mid-Peak		0.00						0.00	0.00	
Off-Peak		0.00						0.00	0.00	
Power Factor Adjustment - $/kVAR		0.27						0.27		

* The ongoing Competition Transition Charge (CTC) of $0.00070 per kWh is recovered in the URG component of Generation. (R)

1 Trans = Transmission and the Transmission Owners Tariff Charge Adjustments (TOTCA) which are FERC approved. The TOTCA represents the Transmission Revenue Balancing Account Adjustment (TRBAA) of $(0.00072) per kWh, Reliability Services Balancing Account Adjustment (RSBAA) of $0.00002 per kWh, and Transmission Access Charge Balancing Account Adjustment (TACBAA) of ($0.00036) per kWh.

2 Distrbtn = Distribution

3 NSGC = New System Generation Charge

4 NDC = Nuclear Decommissioning Charge

5 PPPC = Public Purpose Programs Charge (includes California Alternate Rates for Energy Surcharge where applicable.)

6 DWRBC = Department of Water Resources (DWR) Bond Charge. The DWR Bond Charge is not applicable to exempt Bundled Service and Direct Access Customers, as defined in and pursuant to D.02-10-063, D.02-02-051, and D.02-12-082.

7 PUCRF = The PUC Reimbursement Fee is described in Schedule RF-E.

8 Total = Total Delivery Service rates are applicable to Bundled Service, Direct Access (DA) and Community Choice Aggregation Service (CCA Service) Customers, except DA and CCA Service Customers are not subject to the DWRBC rate component of this Schedule but instead pay the DWRBC as provided by Schedule DA-CRS or Schedule CCA-CRS.

9 Generation = The Generation rates are applicable only to Bundled Service Customers.

10 DWREC = Department of Water Resources (DWR) Energy Credit – For more information on the DWR Energy Credit, see the Billing Calculation Special Condition of this Schedule.

(Continued)

Constellation
An Exelon Company

Mt. San Antonio College
1100 N. Grand Avenue
Walnut, CA 91789

CNE CUSTOMER ID	STATEMENT NO.	PAGE
CA_6337	0016809982	1 of 4
CNE ACCOUNT ID	**STATEMENT DATE**	**DUE DATE**
1-DUX-979	08/14/2014	09/14/2014

For questions or comments, please contact Customer Care at (888)635-0827 Monday through Friday 7:00 am to 6:00 pm Central Standard Time, or email us at customercare@constellation.com.

When contacting Constellation, please reference the CNE ACCOUNT ID found at the top of this page.

ACCOUNT BALANCE	
PREVIOUS STATEMENT DATE	07/15/2014
PREVIOUS BALANCE	$95,242.34
PAYMENTS SINCE LAST INVOICE	$-95,242.34
DEBITS/CREDITS SINCE LAST INVOICE	$0.00
LATE/FINANCE FEE	$0.00
CURRENT CHARGES	$90,844.16
TOTAL AMOUNT DUE	**$90,844.16**

RECEIVED AUG 20 2014

...plement energy conservation measures with no upfront capital outlay. Efficiency ...ide Easy (EME) is a unique solution that lets you include the cost of efficiency ...grades on your electricity bill, and pay for the upgrades over the term of your ...ntract. To learn more, contact us at 1-866-237-7693.

...you are already an EME customer, we thank you for your business.

COPY
OF ORIGINAL INVOICE

PLE... SIGN AND RETURN
TO ACCOUNTS PAYABLE

X _____
...ROVED TO PAY

X _____
DATE

8/21

WIRE TRANSFER INFORMATION:
Constellation NewEnergy, Inc.
ABA-ACH #111000012, ABA-WIRE #026009593
ACCT #4426223690
BANK: Bank of America

REMITTANCE ADDRESS:
Constellation NewEnergy, Inc.
14217 Collections Center Dr.
Chicago IL, 60693

PLEASE RETURN THIS PORTION WITH PAYMENT AND MAKE ALL CHECKS PAYABLE TO Constellation NewEnergy, Inc.

Constellation
An Exelon Company

ENTER AMOUNT ENCLOSED $ _____

Write account number on check and make payable to Constellation NewEnergy, Inc.

Payment Due

September

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

CNE CUSTOMER ID	STATEMENT NO.	DUE DATE
CA_6337	0016809982	09/14/2014
CNE ACCOUNT ID	**STATEMENT DATE**	**AMOUNT DUE**
1-DUX-979	08/14/2014	$90,844.16

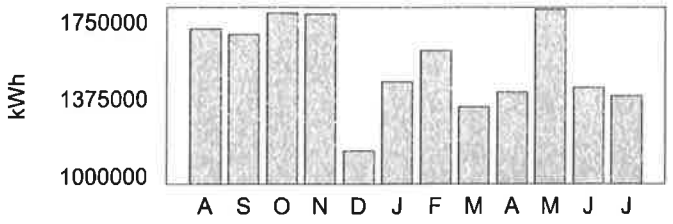
Additional charges per the terms of your contract will be applied to the Total Amount Due if payment is not received on or before the due date.

Gary Nellesen
Mt. San Antonio College - 3000209122
1100 N. Grand Avenue
Walnut, CA 91789

0000000000000MT SAN ANTONIO COLLEGE0000000000001-DUX-979001680998200090844160

SITE NAME	Mt. San Antonio College - 3000209122
SERVICE LOCATION	1100 N Grand Ave Walnut, CA 91789-1341
SCE ACCOUNT ID	3000209122
INVOICE ID	0016809982-0001
kWh	1,376,264.00
SERVICE PERIOD	07/11/2014 to 08/10/2014
PRODUCT	Fixed Price Solutions

12 MONTH HISTORY



METER NO(S). V345N-001221

Contract Charges						
Energy Charge Non TOU	1,376,264.00	kWh at	0.0547320	$/kWh	$75,325.68	
Service Charge					$49.00	
Subtotal Contract Charges						**$75,374.68**
Market Charges						
Capacity Charge $/kW Day 07/11/2014 - 07/31/2014 (NCP 3,880 kW x 21 Days x Capacity Price)	81,479.96	kW Days at	0.0301459	$/kW Days	$2,456.29	
Capacity Charge $/kW Day 08/01/2014 - 08/10/2014 (NCP 3,168 kW x 10 Days x Capacity Price)	31,679.96	kW Days at	0.0501659	$/kW Days	$1,589.25	
Basis Charge	1,443,759.69	kWh at	0.0019888	$/kWh	$2,871.34	
Renewable Portfolio Standards Cost Charge 07/11/2014 - 07/31/2014	1,036,544.00	kWh at	0.0050000	$/kWh	$5,182.72	
Renewable Portfolio Standards Cost Charge 08/01/2014 - 08/10/2014	339,720.00	kWh at	0.0050000	$/kWh	$1,698.60	
Ancillary Services Charge 07/11/2014 - 07/31/2014	1,036,544.00	kWh at	0.0009094	$/kWh	$942.63	
Ancillary Services Charge 08/01/2014 - 08/10/2014	339,720.00	kWh at	0.0009700	$/kWh	$329.53	
Subtotal Market Charges						**$15,070.36**
Subtotal Charges from Constellation NewEnergy						**$90,445.04**
Charges from Taxes						
ENERGY SURCHARGE	1,376,264.00	kWh at	0.0002900		$399.12	
Subtotal Charges from Taxes						**$399.12**
Total Amount Due To Constellation NewEnergy						**$90,844.16**

Adjustments: Any adjustments that were made to your account within the invoice period. Adjustments may be made for a variety of reasons, including special contract calculations, corrections to prior bills, or settlement of disputed charges.
Administration Fee or Service Charge: The fee or charge set forth for each account per billing cycle.
Ancillary Service Charges: charges regarding ancillary services as set forth in the applicable Independent Service Operator (ISO) Open Access Transmission Tariff (OATT) and for other ISO costs not included in the definition of Capacity Costs, Energy Costs, and Transmission Costs. Generally, these costs are associated with ensuring the reliability of the electrical grid.
Capacity Charge: Charge for fulfilling the capacity requirements for the Account(s) imposed by the ISO or otherwise. Generally, these costs are associated with ensuring there is enough generating capacity available now and in the future to meet customer requirements.
Energy Charge - Non-Time of Use (TOU): Charge per kWh for electricity supplied for all hours of each day.
Kilowatt Hour (kWh): A measure of the quantity of electricity (energy) that you use.
Late Fees or Finance Charges: Additional charges assessed to accounts for late payment of invoices. Payment terms and charge calculations are specified in your contract.
Line Loss Charges: The cost associated with the loss of electricity as it travels over the transmission and distribution wires.
Locational Forward Reserves (LFR): Ancillary service administered by the ISO that facilitates the availability of generating units in the future to provide backup reserve service to ensure system reliability.
Reliability Must Run (RMR): Ancillary service administered by the ISO. Generation resources scheduled to operate out-of-merit order and identified by the ISO as necessary to preserve regional system reliability.
Renewable Portfolio Standards Cost (RPS): NewEnergy's cost of procuring renewable energy to comply with Renewable Portfolio Standards (RPS) requirements, usually established by individual states. Generally, these costs are associated with requirements to support generating units that produce power using renewable fuels such as water (hydro-electric)) and solar.
Retail Service Charge: A contracted charge for supplying electricity to an account, based upon total kWh consumption per billing cycle.
Retail Trade Transaction (RTT): The fixed unit Price and Quantity for a specific commodity for a specific delivery point and pattern.
Transmission Service Charge: The charge for Network Transmission Service as identified in the applicable OATT Tariff for the provision of transmission service by the ISO within the Utility's service territory. Generally, these costs are associated with building and maintaining the electric transmission lines.

Disputed Invoices: Should you question any portion of your Constellation NewEnergy invoice, please call 888-635-0827 Monday to Friday 7AM-7PM Central Time, email CNECustomerCare@constellation.com, or write to: Constellation NewEnergy, c/o Customer Care, PO Box 4911 Houston, TX 77210-4911.
If you have a billing dispute that you are not able to resolve with Constellation NewEnergy you may file a complaint with the California Public Utilities Commission (CPUC). The CPUC can be reached by phone at 800-848-5580 or you may visit their website at www.cpuc.ca.gov.

In the event of a service interruption or electric emergency, please contact your utility directly at:

Pacific Gas & Electric	800-743-5002
San Diego Gas & Electric	800-611-7343
Southern California Edison	800-655-4555

DISCLAIMER: General Understanding - This glossary is for informational purposes only. Please refer to your agreement with us for the defined terms that govern the contractual obligations applicable to us supplying you. Not all defined terms set forth above may be applicable to your agreement with Constellation NewEnergy.

PLEASE RETURN THIS PORTION WITH PAYMENT AND MAKE ALL CHECKS PAYABLE TO Constellation NewEnergy, Inc.

If the billing address is incorrect, please fax the new complete billing address to (877) 243-4968.

REMITTANCE ADDRESS:
Constellation NewEnergy, Inc.
14217 Collections Center Dr.
Chicago, IL 60693

9/11/14 MH Becky

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SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

P.O. Box 300
Rosemead, CA
91772-0001
www.sce.com

For billing and service inquiries call 1-800-799-4723,
Mon - Fri 7 a.m. to 7 p.m. and Saturday 8 a.m. to 5 p.m.
For emergency services call 24 hrs a day, 7 days a week

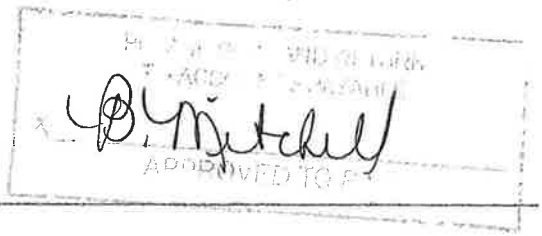
Date bill prepared: Sep 3 '14

Customer account 2-19-986-3549

1100 N GRAND AVE
WALNUT, CA 91789-1341

Your account summary

Amount of your last bill	$95,697.79
Payment we received on Aug 22 '14 - thank you	-$95,697.79
Balance forward	$0.00
Your new charges	$105,568.23
Total amount you owe by Oct 23 '14	**$105,568.23**



Summary of your billing detail

Service account	Service address	Billing period	Your rate	New charges
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Dec 12 '11 to Jan 11 '12	TOU-8-B-STANDBY (Direct Access)	-$20.52
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Jan 11 '12 to Feb 9 '12	TOU-8-B-STANDBY (Direct Access)	-$52.88
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Feb 9 '12 to Mar 12 '12	TOU-8-B-STANDBY (Direct Access)	-$65.35
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Mar 12 '12 to Apr 9 '12	TOU-8-B-STANDBY (Direct Access)	-$53.50
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Apr 9 '12 to May 9 '12	TOU-8-B-STANDBY (Direct Access)	-$57.78
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	May 9 '12 to Jun 8 '12	TOU-8-B-STANDBY (Direct Access)	-$66.58
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Jun 8 '12 to Jul 10 '12	TOU-8-B-STANDBY (Direct Access)	-$40.83
3-000-2091-22 Billing adjustment	1100 N GRAND AVE WALNUT, CA	Jul 10 '12 to Aug 8 '12	TOU-8-B-STANDBY (Direct Access)	-$46.90

(Continued on next page)

(14-574) Tear here

Please return the payment stub below with your payment and make your check payable to Southern California Edison.
If you want to pay in person, call 1-800-747-8908 for locations, or you can pay online at www.sce.com.

Tear here

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Customer account 2-19-986-3549
Please write this number on your check. Make your check payable to Southern California Edison.

Amount due by Oct 23 '14 **$105,568.23**

Amount enclosed $

STMT 09032014 P5

MT SAN ANTONIO COLLEGE
1100 N GRAND AVE
WALNUT, CA 91789-1341

P.O. BOX 300
ROSEMEAD, CA 91772-0001

19 986 3549 00000026 0000000000105568230105568 23

Go paperless at **www.sce.com/ebilling.** It's fast, easy and secure.

Service account 3-000-2091-22
Service address 1100 N GRAND AVE
WALNUT, CA 91789

Rotating outage Group N001

Compare the electricity you are using

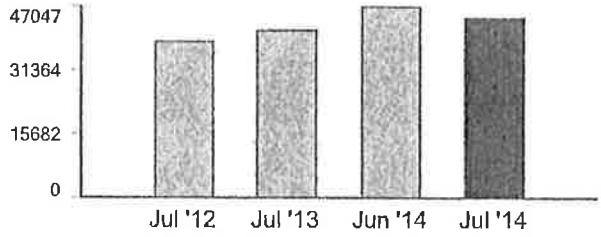
For meter V345N-001221 from Jul 11 '14 to Aug 11 '14
Total electricity you used this month in kWh **1,376,264**

Your next billing cycle will end on or about Sep 10 '14.

	Electricity (kWh)	Demand (kW)	
Summer Season			
On peak	333,856	4,032	(Jul 30 '14 14:00 to 14:15)
Mid peak	411,936	3,776	(Jul 15 '14 11:15 to 11:30)
Off peak	630,472	3,168	(Jul 30 '14 07:15 to 07:30)
Total	**1,376,264**		

Reactive usage is 451,128 kVarh
Maximum demand is 4,032 kW
Standby demand is 1,430 kW
Reactive demand is 1,312 kVar

Your daily average electricity usage (kWh)



Usage comparison

	Jul '12	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13	Jan '14	Feb '14	Mar '14	Apr '14	May '14	Jun '14	Jul '14
Total kWh used	1,118,656	1,196,944	1,658,424	1,635,528	1,727,008	1,721,544	1,142,312	1,434,352	1,569,512	1,329,600	1,392,440	1,742,088	1,411,400	1,376,264
Number of days	29	29	32	29	30	33	31	31	30	30	31	30	30	31
Appx. average kWh used/day	38,574	41,273	51,825	56,397	57,566	52,168	36,848	46,269	52,317	44,326	44,917	58,069	47,046	44,395

Details of your new charges

Your rate: TOU-8-S DBP (Direct Access)
Billing period: Jul 11 '14 to Aug 11 '14 (31 days)

Delivery charges		
Facilities rel demand	2,602 kW x $13.71000	$35,673.42
Energy-Summer		
On peak	333,856 kWh x $0.02009	$6,707.17
Mid peak	411,936 kWh x $0.02009	$8,275.79
Off peak	630,472 kWh x $0.02009	$12,666.18
Customer charge		$312.40
Power factor adj	1,312 kVar x $0.51000	$669.12
Standby charges		
Capacity reservation charge		$10,324.60
Direct Access cost responsibility surcharge *		
DA CRS DWR bond	1,376,264 kWh x $0.00513	$7,060.23
PCIA	1,376,264 kWh x $0.01098	$15,111.38
CTC	1,376,264 kWh x -$0.00135	-$1,857.96

Your Delivery charges include:
- *$11,633.70 transmission charges*
- *$39,736.12 distribution charges*
- *-$591.79 nuclear decommissioning charges*
- *$13,239.66 public purpose programs charge*
- *$10,280.69 new system generation charge*

Your overall energy charges include:
- *$860.37 franchise fees*

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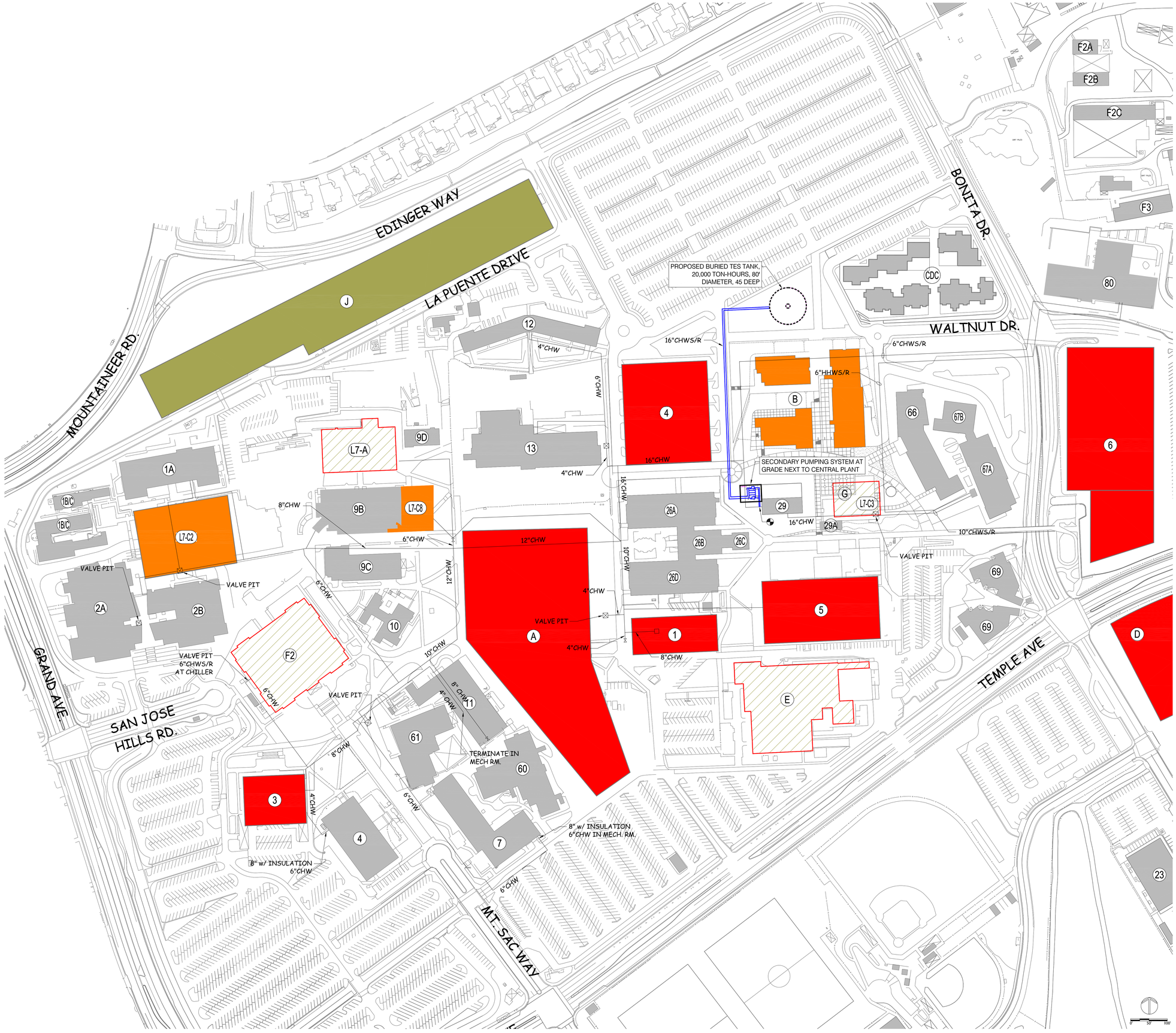
Appendix B - Mt San Antonio TES Schedule and Site Plan



PROPOSED BUILDINGS SCHEDULE

LIBRARY / CAMPUS CENTER	A
BUSINESS & COMPUTER TECHNOLOGY	B
ATHLETIC CONCESSIONS & RESTROOMS	D
CAREER & TECHNICAL BLDG. RENOVATION	E
CLASSROOM BUILDING RENOVATION	F2
LABORATORY BLDG. EXPANSION	G
PARKING STRUCTURE	J
BUILDING 9A RENOVATION	L7-A
FOOD SERVICE	L7-C2
LANGUAGE LAB EXPANSION	L7-C3
STUDENT SUPPORT SERVICES	L7-C8
FUTURE INSTRUCTIONAL BLDG. ZONE	1
AUDITORIUM ZONE	3
FUTURE INSTRUCTIONAL BLDG. ZONE	4-6

EXISTING BUILDINGS

ART CENTER	**1A/B**
ART GALLERY/CLASSROOMS	**1B/C**
PERFORMING ARTS CENTER	**2**
P.E. CENTER/GYM	3
ADMINISTRATION	**4**
LEARNING TECHNOLOGY CENTER	**6**
INFORMATION KIOSK	6A
NATURAL SCIENCES	**7**
CAMPUS CAFÉ	8
AUXILIARY SERVICES	9A
BOOKSTORE	
BURSAR'S OFFICE	
MOUNTIE STOP	
STUDENT SERVICES CENTER	**9B**
STUDENT LIFE CENTER	**9C**
STUDENT SERVICES	9D
CHILD DEVELOPMENT CENTER NORTH	9E
CHILD DEVELOPMENT CENTER NORTH	9F
CHILD DEVELOPMENT CENTER NORTH	9G
FOUNDERS HALL	**10**
CHEMISTRY	**11**
RSCC	11A
AGRICULTURAL SCIENCES	12
FOUNDATION OFFICE	12A
DESIGN AND TECHNOLOGY	**13**
ARTS DIVISION OFFICE/CLASSROOM	16
EXPRESS STOP	16A
BUILDING 16B	16B
BUILDING 16C	16C
BUILDING 16D	16D
BUSINESS DIVISION OFFICES	17
BUILDING 18	18
BUSINESS DIVISION FACULTY OFFICES	18A
CHILD DEVELOPMENT FACULTY OFFICES	
BUSINESS DIVISION FACULTY OFFICES	18B
CHILD DEVELOPMENT CENTER SOUTH	19A
CHILD DEVELOPMENT CLASSES	19B
FASHION	
HOSPITALITY/RESTAURANT MANAGEMENT	
NUTRITION	
MOUNTIE GRILL	19C
INTERIOR DESIGN	20
PE DANCE STUDIO	21
PHOTOGRAPHY	
BUILDING 21A	21A
BUILDING 21B	21B
BUILDING 21C	21C
BUILDING 21D	21D
CONSTRUCTION OFFICES	23
INFORMATION TECHNOLOGY	
PUBLIC SAFETY	
TELECOMMUNICATIONS	
DATA CENTER	23A
HUMANITIES/SOCIAL SCIENCES NORTH	**26A**
HUMANITIES/SOCIAL SCIENCES EAST	**26B**
PLANETARIUM	**26C**
HUMANITIES/SOCIAL SCIENCES WEST	**26D**
EXERCISE SCIENCE/WELLNESS CENTER	27A
POOL	27B
P.E. CENTER	27C
P.E. OFFICES	27D
APPLIED SCIENCES/HEALTH SCIENCES	28A
APPLIED SCIENCES/HEALTH SCIENCES	28B
CENTRAL PLANT	**29**
MATH/GRAPHICS	29E
ADULT BASIC EDUCATION CENTER	30
ESL CLASSROOMS	31A
ESL CLASSROOMS	31B
HIGH SCHOOL REFERRAL/ADULT	32
DIPLOMA PROGRAM	
REGIONAL HEALTH OFFICES RESOURCE CENTER	35
OLDER ADULT PROGRAMS	36
HCRC SIMULATION	37
HIGH SCHOOL REFERRAL/ADULT	38A
DIPLOMA PROGRAM	
HIGH SCHOOL REFERRAL/ADULT	
DIPLOMA PROGRAM	38B
CONTINUING EDUCATION DEPT.	40
PARKING OFFICES	
QUICK STOP	
VOCATION TECH ED ACT	
KINESIOLOGY AND ATHLETICS	45
TEMPORARY SPACE	46
FACILITIES MANAGEMENT	47
DSA INSPECTORS	47A
RECEIVING/TRANSPORTATION	48
STADIUM PRESS BOX	50D
P.E. CENTER FIELD HOUSE	50G
STADIUM CONCESSIONS	50H
ATHLETIC STORAGE BUILDING	51
SCIENCE LABORATORIES	**60**
MATH/SCIENCE	**61**
PRIME STOP	
LANGUAGE CENTER	**66**
HEALTH CAREERS	**67A**
SHORT STOP	
HEALTH CAREERS RESOURCE CENTER	**67B**
STUDENT HEALTH CENTER	
WELDING/HEATING AIR CONDITIONING	69
CHILD DEVELOPMENT CENTER	**70-74**
AGRICULTURAL SCIENCES BUILDING	**80**
BRACKETT FIELD	104
CENTRAL PLANT	CP
HORTICULTURE UNITS	F1
SMALL ANIMAL UNIT	F2A
SMALL ANIMAL UNIT	F2B
LANDSCAPING/IRRIGATION LAB	F2C
AGRICULTURAL TECHNOLOGY CENTER	F3
STORAGE	F4
VIVARIUM	F5
SHEEP UNIT	F6
EQUIPMENT TECH. UNIT	F7A
R.V. TECHNOLOGY	F7B
EQUINE CENTER: TACK ROOM, HORSE BARN, PARLOR, PADDOCK, AND BREEDING	F8
LIVESTOCK PAVILION	F9
48TH AGRICULTURAL DISTRICT OFFICE	F10

(BUILDINGS BOLDED CONNECT TO CENTRAL PLAN)

p2s

P2S Engineering, Inc.

5000 East Spring Street, 8th Floor
Long Beach, CA 90815-5218
T 562.497.2999 F 562.497.2990

www.p2seng.com

Consultant

Project Title

MT SAC
TES INCENTIVE

Mt. San Antonio College
1100 N. Grand Avenue
Walnut, CA 91789

MT. SAC
Mt. San Antonio College

Phone: (909) 594-5611
Web: www.mtsac.edu

REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Revisions

Number	Description	Date

Designed	M. AMALFITANO
Drawn	E. ORTIZ
Checked	M. AMALFITANO
Approved	
Date	9/30/2014
Submittal	
Scale	NO SCALE

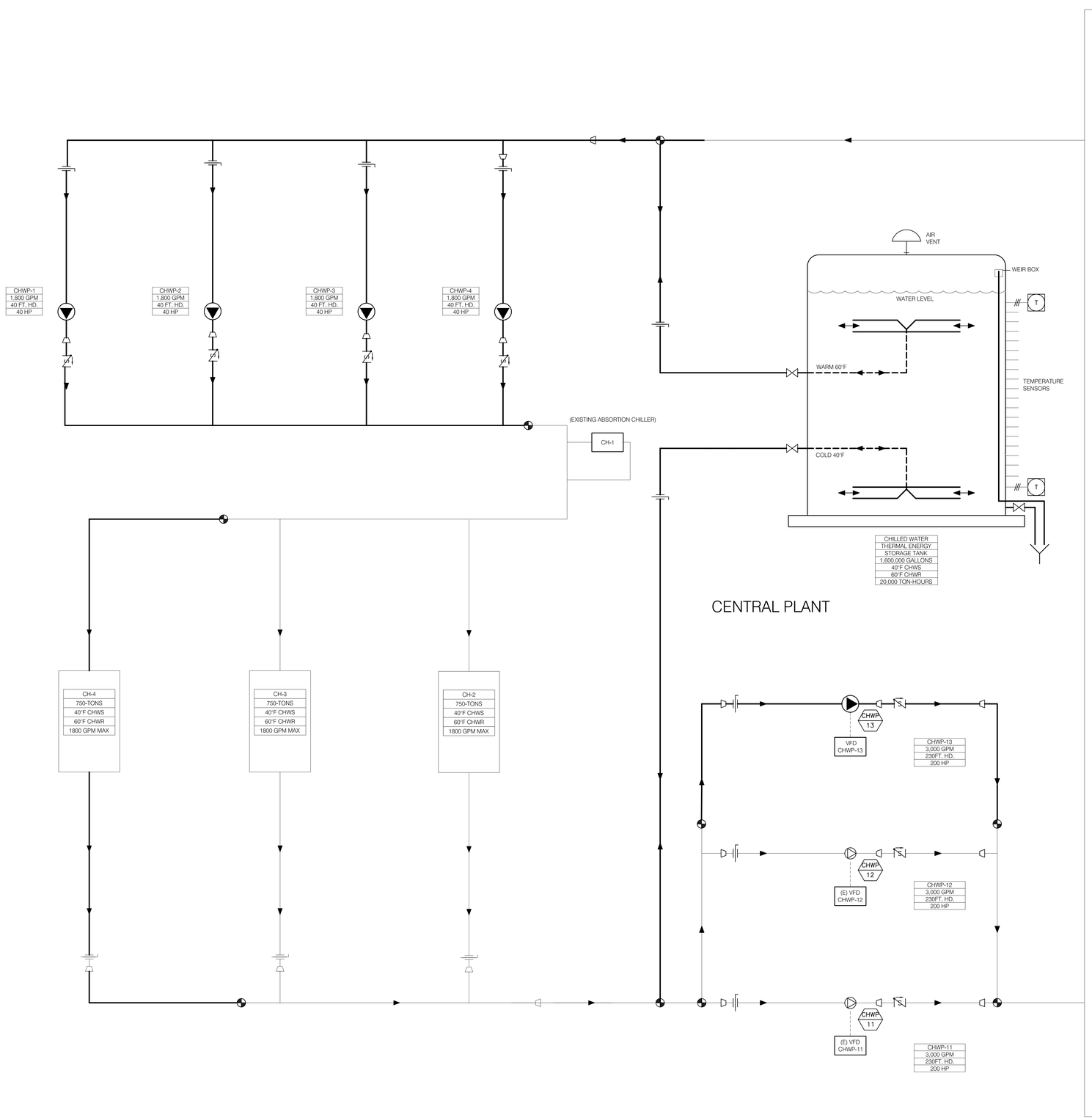
Sheet Title

SCHEMATIC DIAGRAM

Sheet Number

M001

J7233 - MT SAC TES INCENTIVE



P2S Engineering, Inc.

5000 East Spring Street, 8th Floor
Long Beach, CA 90815-5218
T 562.497.2999 F 562.497.2990

www.p2seng.com

Consultant

Project Title

MT SAC
TES INCENTIVE

Mt. San Antonio College
1100 N. Grand Avenue
Walnut, CA 91789

Phone: (909) 594-5611
Web: www.mtsac.edu

REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Revisions

Number	Description	Date

Designed	M. AMALFITANO
Drawn	E. ORTIZ
Checked	M. AMALFITANO
Approved	
Date	9/30/2014
Submittal	-
Scale	NO SCALE

Sheet Title

SCHEMATIC DIAGRAM

Sheet Number

M003

CHILLERS

MARK	MANUFACTURER & MODEL	LOCATION	TYPE	SERVICE	CAPACITY TONS	VSD	NPLV	REFRIGERANT		COMPRESSOR						EVERPORATOR						CONDENSOR						SHIPPING WEIGHT LBS	OPERATING WEIGHT LBS	REMARKS	ANCHORAGE
								TYPE	CHARGE LBS	VOLTAGE	PHASE	HERTZ	INPUT KW	KW/TON	RLA/MCA/MOCP	NOM. GPM MAX. GPM MIN. GPM	EWT °F	LWT °F	PASS	PD PSID	FOULING FACTOR	GPM	EWT °F	LWT °F	PASS	PD PSID	FOULING FACTOR				
(E) CH-2	TRANE CWF-077	CENTRAL PLANT	CENTRIFUGAL	CAMPUS	750	YES	.3913	R-123	1400	480	3	-	-	-	605 / 1200	1800	51.0	41	-	31.6	-	1500	83.0	97.0	-	17.0	-	-	32421		
(E) CH-3	TRANE CWF-077	CENTRAL PLANT	CENTRIFUGAL	CAMPUS	750	YES	.3913	R-123	1400	480	3	-	-	-	605 / 1200	1800	51.0	41	-	31.6	-	1500	83.0	97.0	-	17.0	-	-	32421		
(E) CH-1 (BUILDING 2)	SMARDT WA095.2HXX.22N	RM-206	CENTRIFUGAL	BLDG-2 / CAMPUS	250	YES	-	134A	695	480	3	60	146.0	0.586	218/270/350	398 1000 280	44	59	2	1.70	0.00010	750	85	95	2	4.06	0.00025	8030	9930		
(E) CH-2 (BUILDING 2)	SMARDT WA095.2HXX.22N	RM-206	CENTRIFUGAL	BLDG-2 / CAMPUS	250	YES	-	134A	695	480	3	60	146.0	0.586	218/270/350	398 1000 280	44	59	2	1.70	0.00010	750	85	95	2	4.06	0.00025	8030	9930		
CH-4	TRANE CWF-077	CENTRAL PLANT	CENTRIFUGAL	CAMPUS	750	YES	.3913	R-123	1400	480	3	-	-	-	605 / 1200	1800	51.0	41	-	31.6	-	1500	83.0	97.0	-	17.0	-	-	32421		

THERMAL ENERGY STORAGE TANK

MARK	MANUFACTURER	LOCATION	TYPE	SERVICE	TANK CAPACITY (TONS/HOURS)	TANK VOLUME (GALLONS)	TANK HEIGHT (FT)	TANK DIAMETER (FT)	EWT (°F)	LWT (°F)	REMARKS
TES-1	DN TANKS	PARKING LOT	PARTIALLY BURIED	CHILLED WATER DISTRIBUTION	20,000	1,600,000	80	45	60	40	

CHILLED WATER PUMPS

MARK	MANUFACTURER & MODEL	LOCATION	TYPE	SERVICE	DESIGN POINT		MOTOR			OPERATING WEIGHT LBS	REMARKS	ANCHORAGE DETAIL
					FLOW GPM	HEAD FT HD	HP	V/PH	RPM			
(E) CHWP-11	VELL & GOSSETT VSCS 10X12X17	CENTRAL PLANT	CENTRIFUAL	CAMPUS CHILLED WATER	3000	230	200	460 / 3	1770	2800		
(E) CHWP-12	VELL & GOSSETT VSCS 10X12X17	CENTRAL PLANT	CENTRIFUAL	CAMPUS CHILLED WATER	3000	230	200	460 / 3	1770	2800		
(E) CHWP-1 BUILIDNG 2	ARMSTRONG 4300-6X6X13	BUILDING 2	VERTICAL, SPLIT COUPLED	CAMPUS CHILLED WATER	560	65	20	460/ 3	1200	680		
(E) CHWP-2 BUILIDNG 2	ARMSTRONG 4300-6X6X13	BUILDING 2	VERTICAL, SPLIT COUPLED	CAMPUS CHILLED WATER	560	65	20	460/ 3	1200	680		
(E) CHWP-3 BUILIDNG 2	ARMSTRONG 4300-6X6X13	BUILDING 2	VERTICAL, SPLIT COUPLED	CAMPUS CHILLED WATER	500	100	30	460/ 3	1800	650		
(E) CHWP-4 BUILIDNG 2	ARMSTRONG 4300-6X6X13	BUILDING 2	VERTICAL, SPLIT COUPLED	CAMPUS CHILLED WATER	500	100	30	460/ 3	1800	650		
CHWP 1	ARMSTRONG 4300 8X8X13	CENTRAL PLANT	CENTRIFUGAL	CAMPUS CHILLED WATER	1800	40	40	460/3	1800	800		
CHWP 2	ARMSTRONG 4300 8X8X13	CENTRAL PLANT	CENTRIFUGAL	CAMPUS CHILLED WATER	1800	40	40	460/3	1800	800		
CHWP 3	ARMSTRONG 4300 8X8X13	CENTRAL PLANT	CENTRIFUGAL	CAMPUS CHILLED WATER	1800	40	40	460/3	1800	800		
CHWP 4	ARMSTRONG 4300 8X8X13	CENTRAL PLANT	CENTRIFUGAL	CAMPUS CHILLED WATER	1800	40	40	460/3	1800	800		
(E) CHWP-13	VELL & GOSSETT VSCS 10X12X17	CENTRAL PLANT	CENTRIFUAL	CAMPUS CHILLED WATER	3000	230	200	460 / 3	1770	2800		

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REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Revisions

Number	Description	Date

Designed M. AMALFITANO
Drawn IE. ORTIZ
Checked M. AMALFITANO
Approved

Date 9/30/2014

Submittal -

Scale NO SCALE

Sheet Title

CHILLED WATER EQUIPMENT SCHEDULES

Sheet Number

M002

Appendix C - Mt San Antonio College Load Profile

Building #	BUILDING NAME	BUILDING USE	AREA (SF)	SCHEDULED COMPLETION	ESTIMATED LOAD (TONS)	Calculated TRACE LOAD (TONS)	Calculated SF/ton
Existing							
1A	Art Center	Classrooms	16,700	1971		60.4	276
1 B/C	Art Studio Complex	Classrooms	16,136			73.4	220
2B	Fedderson Recital Hall	Theater/Music Hall	63,361	2003 Expansion		192.6	329
4	Administration	Offices	41,693	1963		113.1	369
6	Learning Technology Center	Offices	101,784	1997		249.4	408
7	Science South	Classrooms/Labs	37,226	-		297.8	125
9B	Student Services	Offices	51,369	2006 Reno.		117.8	436
11	Science North	Classrooms/Labs	18,939	-		107.5	176
12	Building 12 Renovation	Classroom	13,000	2014		49.4	263
13	Design Technology	Classroom	62,000	2012		162.7	381
26	Humanities/Social Sciences	Classrooms	98,320			358.2	274
29	Central Plant	Office	148	2003		1.0	148
60	Science	Labs	62,982	2006		248.8	253
61	Math & Sciences	Classrooms/Labs	64,139	2006		210.7	304
66	Language Center	Classrooms	43,911	2003 Reno.		122.6	358
67A	Health Careers	Classroom	31,768	2003 Reno.		89.9	353
67B	Student Health	Offices	10,995	2003 Reno.		33.0	333
70-73	Early Childhood Education Center	Children Center	36,012	2013		99.0	364
80	Agriculture Science Building	Lab	51,100	2012		213.4	239
Totals						2801	295

2015							
9A	Food Services	Food Service/Dining	12,000	2015		51.8	
9B Add.	Student Support Services	Offices	16,056	2015		53.1	302
	Business and Technology Center	Classroom/Comp. Lab	87,000	2015		365.0	238
Totals						470	296

Phase 2							
	Athletics Phase 1		45,000	2016	240		188
	Library/Campus Center	Library	217,200	2017-2019	543		400
	Classroom Building Renovation	Classroom	101,400	2017-2019	254		399
	Language Lab Expansion	Labs	15,000	2017-2019	38		395
	Building 9A Renovation	Food Service/Dining	21,300	2017-2019	53		402
	Building 40 Continuing Education Remodel	Classroom	24,440	2017-2019	61		401
	Athletics Phase 2	Athletics	50,000	2017-2019	260		192
Totals					**1449**		399

Phase 3							
	Future Instruction Building Zone	Classroom	50,000	2020	125		400
	Auditorium Zone	Auditorium	12,000	2020	30		400
	Future Instruction Building Zone	Classroom	75,000	2025	188		399
	Future Instruction Building Zone	Classroom	100,000	2025	250		400
Totals					**593**		400

9/15/2014	CHWS	CHWR	FM4 Plnt Raw GPM	FM1 Plnt Raw GPM	BTUH	CP TONNAGE	Bldg 2 Tonnage	TOTAL
12:00 AM	40	49.1	453	975	6,497,400	541	181	723
1:00 AM	40	49.4	371.9	1,130.10	7,059,400	588	143	731
2:00AM	40	50.5	242	1,077.80	6,928,950	577	150	728
3:00 AM	40	50.5	203.4	1,059.60	6,630,750	553	134	687
4:00 AM	40	50.6	190.6	1,234.90	7,555,150	630	141	771
5:00 AM	40	52.6	170.5	1,333.60	9,475,830	790	181	971
6:00 AM	40	53.8	187.6	1,525.20	11,818,320	985	325	1,310
7:00 AM	40	52.2	206.4	1,958.20	13,204,060	1,100	181	1,281
8:00 AM	40	52.6	297.8	1,930.00	14,035,140	1,170	167	1,337
9:00 AM	40	53	326.4	2,121.40	15,910,700	1,326	150	1,476
10:00 AM	40	54.1	422	2,125.40	17,959,170	1,497	163	1,660
11:00 AM	42	55.4	407.5	2,314.70	18,238,740	1,520	358	1,878
12:00 PM	44	56.6	418.7	2,433.60	17,969,490	1,497	353	1,850
1:00 PM	46	58.3	501.2	2,518.40	18,570,540	1,548	404	1,951
2:00 PM	48	60.4	583.6	2,522.50	19,257,820	1,605	414	2,019
3:00 PM	50	64.2	552.6	2,633.20	22,619,180	1,885	426	2,311
4:00 PM	48	61	562.5	2,574.80	20,392,450	1,699	423	2,123
5:00 PM	46	59	496.2	2,506.30	19,516,250	1,626	416	2,042
6:00 PM	43	56.3	423.3	2,417.50	18,891,320	1,574	344	1,918
7:00 PM	40	54	422	2,183.80	18,240,600	1,520	292	1,812
8:00 PM	40	54	370.6	1,930.00	16,104,200	1,342	222	1,564
9:00 PM	40	53.6	366.3	1,889.70	15,340,800	1,278	199	1,477
10:00 PM	40	52.4	246	1,766.90	12,479,980	1,040	180	1,220
11:00 PM	45	51.9	16.5	751.4	2,649,255	221	133	354

System Checksums

By P2S Engineering, Inc

AH1 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 15
Outside Air: OADB/WB/HR: 95 / 71 / 78

	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
Skylite Cond	0	0	0	0
Roof Cond	0	20,321	20,321	2
Glass Solar	7,902	0	7,902	1
Glass/Door Cond	4,493	0	4,493	1
Wall Cond	8,620	6,651	15,271	2
Partition/Door	2,484		2,484	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	23,499	26,972	50,471	6
Internal Loads				
Lights	21,057	5,264	26,321	3
People	153,450	0	153,450	18
Misc	13,471	0	13,471	2
Sub Total ==>	187,978	5,264	193,242	23
Ceiling Load	3,691	-3,691	0	0
Ventilation Load	0	0	584,952	70
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	3,318		3,318	0
Exhaust Heat		-28,545	-28,545	-3
Sup. Fan Heat			35,320	4
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	218,486	0	838,759	100.00

CLG SPACE PEAK

Mo/Hr: 10 / 16
OADB: 93

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	16,426	6
Glass/Door Cond	4,370	2
Wall Cond	11,346	4
Partition/Door	2,725	1
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	34,868	12
Internal Loads		
Lights	21,057	7
People	85,250	30
Misc	13,471	5
Sub Total ==>	119,778	42
Ceiling Load	3,475	1
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	125,984	44
Grand Total ==>	284,105	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 30

	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	-10,538	2.17
Glass Solar	0	0	0.00
Glass/Door Cond	-9,026	-9,026	1.86
Wall Cond	-7,341	-12,912	2.66
Partition/Door	-5,692	-5,692	1.17
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-22,059	-38,169	7.87
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	-4,852	0	0.00
Ventilation Load	0	-190,518	39.27
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		11,258	-2.32
OA Preheat Diff.		-267,737	55.18
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-26,911	-485,166	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	73.4
Ra Plenum	73.7	65.8
Return	73.7	65.8
Ret/OA	95.0	30.0
Fn MtrTD	0.2	0.0
Fn BldTD	0.5	0.0
Fn Frict	1.4	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	15,685	4,706
Terminal	15,685	4,706
Main Fan	15,685	4,706
Sec Fan	0	0
Nom Vent	15,685	4,706
AHU Vent	15,685	4,706
Infil	0	0
MinStop/Rh	4,706	4,706
Return	15,685	4,706
Exhaust	15,685	4,706
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	100.0	100.0
cfm/ft²	2.30	0.69
cfm/ton	224.40	
ft²/ton	97.57	
Btu/hr·ft²	122.99	-71.14
No. People	341	

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	69.9	838.8	570.2	15,685	95.0	70.5	78.2	52.9	52.8	62.3
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	69.9	838.8								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	6,820		
Part	1,006		
Int Door	0		
ExFlr	0		
Roof	7,423	0	0
Wall	2,919	304	10
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-102.7	4,706	52.9	73.4
Aux Htg	0.0	0	0.0	0.0
Preheat	-382.5	15,685	30.0	52.9
Reheat	-75.8	4,706	52.9	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-485.2			

System Checksums

By P2S Engineering, Inc

AH2 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 15
Outside Air: OADB/WB/HR: 95 / 71 / 78

	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
Skylite Cond	0	0	0	0
Roof Cond	0	25,869	25,869	4
Glass Solar	18,669	0	18,669	3
Glass/Door Cond	7,002	0	7,002	1
Wall Cond	15,462	11,571	27,032	4
Partition/Door	8,114		8,114	1
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	49,247	37,440	86,687	13
Internal Loads				
Lights	46,802	9,567	56,369	9
People	183,825	0	183,825	28
Misc	18,164	0	18,164	3
Sub Total ==>	248,791	9,567	258,358	39
Ceiling Load	6,374	-6,374	0	0
Ventilation Load	0	0	234,120	36
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-14,032	-14,032	-2
Sup. Fan Heat			77,766	12
Ret. Fan Heat		14,139	14,139	2
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	304,412	40,741	657,038	100.00

CLG SPACE PEAK

Mo/Hr: 8 / 16
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	26,932	6
Glass/Door Cond	5,909	1
Wall Cond	19,851	5
Partition/Door	9,079	2
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	61,770	14
Internal Loads		
Lights	46,802	11
People	102,808	24
Misc	18,164	4
Sub Total ==>	167,774	39
Ceiling Load	6,113	1
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	196,522	45
Grand Total ==>	432,180	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 30

	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	-13,611	4.23
Glass Solar	0	0	0.00
Glass/Door Cond	-14,548	-14,548	4.52
Wall Cond	-13,886	-24,211	7.52
Partition/Door	-18,390	-18,390	5.71
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-46,824	-70,760	21.97
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	-8,299	0	0.00
Ventilation Load	0	-233,718	72.58
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		12,610	-3.92
OA Preheat Diff.		-9,468	2.94
RA Preheat Diff.		-20,680	6.42
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-55,123	-322,017	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	78.8
Ra Plenum	73.6	66.0
Return	74.1	66.0
Ret/OA	79.5	37.0
Fn MtrTD	0.3	0.0
Fn BldTD	0.7	0.0
Fn Frict	2.1	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	23,860	7,158
Terminal	23,860	7,158
Main Fan	23,860	7,158
Sec Fan	0	0
Nom Vent	6,178	5,773
AHU Vent	6,178	5,773
Infil	0	0
MinStop/Rh	7,158	7,158
Return	23,860	7,158
Exhaust	6,178	5,773
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	25.9	80.6
cfm/ft²	1.87	0.56
cfm/ton	435.77	
ft²/ton	233.32	
Btu/hr·ft²	51.43	-27.36
No. People	412	

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	54.8	657.0	494.0	23,860	79.5	62.9	63.4	51.9	51.9	60.1
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	54.8	657.0								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	12,775		
Part	3,250		
Int Door	0		
ExFlr	0		
Roof	9,535	0	0
Wall	5,380	490	9
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-205.1	7,158	51.9	78.8
Aux Htg	0.0	0	0.0	0.0
Preheat	-144.4	6,178	30.0	51.9
Reheat	-122.5	7,158	51.9	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-349.5			

System Checksums

By P2S Engineering, Inc

AH3 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 7 / 15
Outside Air: OADB/WB/HR: 95 / 71 / 78

	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
Skylite Cond	0	0	0	0
Roof Cond	0	15,654	15,654	2
Glass Solar	5,655	0	5,655	1
Glass/Door Cond	3,460	0	3,460	0
Wall Cond	10,105	7,290	17,394	2
Partition/Door	175		175	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	19,395	22,944	42,339	5
Internal Loads				
Lights	25,273	6,182	31,454	4
People	207,968	0	207,968	24
Misc	27,714	0	27,714	3
Sub Total ==>	260,954	6,182	267,135	31
Ceiling Load	4,535	-4,535	0	0
Ventilation Load	0	0	542,759	63
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	434		434	0
Exhaust Heat		-24,590	-24,590	-3
Sup. Fan Heat			33,598	4
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	285,318	0	861,674	100.00

CLG SPACE PEAK

Mo/Hr: 10 / 15
OADB: 94

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	10,269	4
Glass/Door Cond	3,363	1
Wall Cond	14,220	5
Partition/Door	217	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	28,068	10
Internal Loads		
Lights	25,273	9
People	115,538	43
Misc	27,714	10
Sub Total ==>	168,524	62
Ceiling Load	4,079	2
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	69,577	26
Grand Total ==>	270,248	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 30

	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	-8,270	1.80
Glass Solar	0	0	0.00
Glass/Door Cond	-6,948	-6,948	1.52
Wall Cond	-9,585	-16,397	3.58
Partition/Door	-402	-402	0.09
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-16,935	-32,016	6.98
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	-5,742	0	0.00
Ventilation Load	0	-181,226	39.52
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		9,340	-2.04
OA Preheat Diff.		-254,679	55.54
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-22,676	-458,581	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	72.8
Ra Plenum	73.6	66.0
Return	73.6	66.0
Ret/OA	95.0	30.0
Fn MtrTD	0.2	0.0
Fn BldTD	0.5	0.0
Fn Frict	1.4	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	14,920	4,476
Terminal	14,920	4,476
Main Fan	14,920	4,476
Sec Fan	0	0
Nom Vent	14,920	4,476
AHU Vent	14,920	4,476
Infil	0	0
MinStop/Rh	4,476	4,476
Return	14,920	4,476
Exhaust	14,920	4,476
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	100.0	100.0
cfm/ft²	1.61	0.48
cfm/ton	207.78	
ft²/ton	128.86	
Btu/hr·ft²	93.12	-49.56
No. People	462	

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	71.8	861.7	592.3	14,920	95.0	70.5	78.2	52.9	52.1	59.3
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	71.8	861.7								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	9,253		
Part	71		
Int Door	0		
ExFlr	0		
Roof	5,779	0	0
Wall	3,540	234	7
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-94.8	4,476	52.9	72.8
Aux Htg	0.0	0	0.0	0.0
Preheat	-363.8	14,920	30.0	52.9
Reheat	-72.1	4,476	52.9	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-458.6			

System Checksums

By P2S Engineering, Inc

Bldg 70 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	18,583	18,583	10
Glass Solar	18,346	0	18,346	10
Glass/Door Cond	3,271	0	3,271	2
Wall Cond	4,322	766	5,088	3
Partition/Door	0		0	0
Floor	15,509		15,509	8
Adjacent Floor	0	0	0	0
Infiltration	8,387		8,387	4
Sub Total ==>	49,835	19,349	69,183	37
Internal Loads				
Lights	21,110	5,278	26,388	14
People	29,538	0	29,538	16
Misc	25,693	0	25,693	14
Sub Total ==>	76,341	5,278	81,619	43
Ceiling Load	24,626	-24,626	0	0
Ventilation Load	0	0	18,638	10
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	19,285	10
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	150,802	0	188,725	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 16
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	18,346	14
Glass/Door Cond	3,271	2
Wall Cond	4,322	3
Partition/Door	0	0
Floor	15,509	12
Adjacent Floor	0	0
Infiltration	7,532	6
Sub Total ==>	48,979	36
Internal Loads		
Lights	21,110	16
People	14,349	11
Misc	25,693	19
Sub Total ==>	61,152	45
Ceiling Load	24,626	18
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Exhaust Heat		
OA Preheat Diff.		
RA Preheat Diff.		
Additional Reheat		
Underflr Sup Ht Pkup		
Supply Air Leakage		
***Grand Total* ==>**	134,757	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-10,841	9.26
Glass Solar	0	0	0.00
Glass/Door Cond	-6,016	-6,016	5.14
Wall Cond	-8,365	-11,165	9.54
Partition/Door	0	0	0.00
Floor	-24,238	-24,238	20.71
Adjacent Floor	0	0	0
Infiltration	-13,456	-13,456	11.50
Sub Total ==>	-52,075	-65,715	56.16
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	-13,640	0	0.00
Ventilation Load	0	-29,901	25.55
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-21,399	18.29
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-65,715	-117,015	100.00

TEMPERATURES

	Cooling	Heating
SADB	60.0	90.7
Ra Plenum	85.5	61.7
Return	74.0	68.0
Ret/OA	75.7	57.7
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	8,748	2,624
Terminal	8,748	2,624
Main Fan	8,748	2,624
Sec Fan	0	0
Nom Vent	678	678
AHU Vent	678	678
Infil	305	305
MinStop/Rh	2,624	2,624
Return	8,578	2,455
Exhaust	508	508
Rm Exh	475	475
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	7.8	25.8
cfm/ft²	1.29	0.39
cfm/ton	556.23	
ft²/ton	431.23	
Btu/hr·ft²	27.83	-17.25
No. People	56	

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	15.7	188.7	170.8	8,748	75.7	62.3	63.6	58.0	55.0	60.7
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	15.7	188.7								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	6,782		
Part	0		
Int Door	0		
ExFlr	6,361		
Roof	9,918	0	0
Wall	4,531	551	12
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-94.6	2,624	58.0	90.7
Aux Htg	0.0	0	0.0	0.0
Preheat	-22.4	678	28.0	58.0
Reheat	-28.9	2,624	58.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-117.0			

System Checksums

By P2S Engineering, Inc

Bldg 71 — **Single Zone Variable Air Volume**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	21,281	21,281	7
Glass Solar	26,357	0	26,357	8
Glass/Door Cond	6,041	0	6,041	2
Wall Cond	3,970	893	4,863	1
Partition/Door	0		0	0
Floor	17,984		17,984	6
Adjacent Floor	0	0	0	0
Infiltration	10,777		10,777	3
Sub Total ==>	65,128	22,174	87,302	27
Internal Loads				
Lights	25,782	6,445	32,227	10
People	89,251	0	89,251	28
Misc	23,872	0	23,872	7
Sub Total ==>	138,905	6,445	145,350	45
Ceiling Load	28,620	-28,620	0	0
Ventilation Load	0	0	69,850	22
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	21,854	7
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	232,653	0	324,356	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 16
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	26,357	14
Glass/Door Cond	6,041	3
Wall Cond	3,970	2
Partition/Door	0	0
Floor	17,984	10
Adjacent Floor	0	0
Infiltration	9,710	5
Sub Total ==>	64,061	34
Internal Loads		
Lights	25,782	14
People	45,901	24
Misc	23,872	13
Sub Total ==>	95,554	51
Ceiling Load	28,620	15
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	188,235	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-12,491	6.49
Glass Solar	0	0	0.00
Glass/Door Cond	-11,111	-11,111	5.77
Wall Cond	-7,858	-10,964	5.70
Partition/Door	0	0	0.00
Floor	-28,106	-28,106	14.60
Adjacent Floor	0	0	0
Infiltration	-17,346	-17,346	9.01
Sub Total ==>	-64,421	-80,018	41.58
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	-15,597	0	0.00
Ventilation Load	0	-112,429	58.42
Adj Air Trans Heat	0	0	0
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
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-80,018	-192,447	100.00

TEMPERATURES

	Cooling	Heating
SADB	56.8	92.4
Ra Plenum	84.3	62.4
Return	74.0	68.0
Ret/OA	79.8	33.7
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	9,913	2,974
Terminal	9,913	2,974
Main Fan	9,913	2,974
Sec Fan	0	0
Nom Vent	2,550	2,550
AHU Vent	2,550	2,550
Infil	393	393
MinStop/Rh	2,974	2,974
Return	9,707	2,767
Exhaust	2,343	2,343
Rm Exh	600	600
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	25.7	85.7
cfm/ft²	1.13	0.34
cfm/ton	366.76	
ft²/ton	323.46	
Btu/hr·ft²	37.10	-22.01
No. People	182	

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	27.0	324.4	273.0	9,913	79.8	63.9	64.5	54.8	52.8	57.0
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	27.0	324.4								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	8,743		
Part	0		
Int Door	0		
ExFlr	7,376		
Roof	11,189	0	0
Wall	4,922	1,017	21
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-192.5	2,974	33.7	92.4
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	-192.5			

System Checksums

By P2S Engineering, Inc

Bldg 72 **Single Zone Variable Air Volume**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	30,050	30,050	9
Glass Solar	31,230	0	31,230	9
Glass/Door Cond	7,302	0	7,302	2
Wall Cond	4,618	2,740	7,358	2
Partition/Door	0		0	0
Floor	22,262		22,262	6
Adjacent Floor	0	0	0	0
Infiltration	8,214		8,214	2
Sub Total ==>	73,626	32,790	106,416	31
Internal Loads				
Lights	29,297	7,324	36,621	11
People	107,910	0	107,910	31
Misc	26,354	0	26,354	8
Sub Total ==>	163,561	7,324	170,885	49
Ceiling Load	10,780	-10,780	0	0
Ventilation Load	0	0	77,376	22
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-7,560	-7,560	-2
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	247,966	21,775	347,117	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 15
OADB: 97

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	34,274	17
Glass/Door Cond	7,184	4
Wall Cond	4,408	2
Partition/Door	0	0
Floor	22,262	11
Adjacent Floor	0	0
Infiltration	7,623	4
Sub Total ==>	75,752	39
Internal Loads		
Lights	29,297	15
People	55,154	28
Misc	26,354	13
Sub Total ==>	110,805	56
Ceiling Load	10,059	5
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	196,615	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-16,445	7.90
Glass Solar	0	0	0.00
Glass/Door Cond	-13,431	-13,431	6.45
Wall Cond	-8,733	-14,277	6.86
Partition/Door	0	0	0.00
Floor	-34,793	-34,793	16.72
Adjacent Floor	0	0	0
Infiltration	-13,264	-13,264	6.37
Sub Total ==>	-70,220	-92,210	44.31
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	-12,925	0	0.00
Ventilation Load	0	-124,949	60.04
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		9,065	-4.36
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-83,145	-208,094	100.00

TEMPERATURES

	Cooling	Heating
SADB	53.6	94.6
Ra Plenum	77.4	63.9
Return	77.4	63.9
Ret/OA	83.6	28.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	8,755	2,834
Terminal	8,755	2,834
Main Fan	8,755	2,834
Sec Fan	0	0
Nom Vent	2,834	2,834
AHU Vent	2,834	2,834
Infil	301	301
MinStop/Rh	2,834	2,834
Return	7,942	2,022
Exhaust	2,022	2,022
Rm Exh	1,113	1,113
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	32.4	100.0
cfm/ft²	0.87	0.28
cfm/ton	302.65	
ft²/ton	346.67	
Btu/hr·ft²	34.61	-20.75
No. People	218	

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	28.9	347.1	286.1	8,657	83.6	65.2	64.8	53.6	51.7	54.7
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	28.9	347.1								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	10,028		
Part	0		
Int Door	0		
ExFlr	9,131		
Roof	14,091	0	0
Wall	6,303	1,229	20
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-208.1	2,834	28.0	94.6
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	-208.1			

System Checksums

By P2S Engineering, Inc

Bldg 73 | **Single Zone Variable Air Volume**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	27,025	27,025	8
Glass Solar	20,573	0	20,573	6
Glass/Door Cond	6,371	0	6,371	2
Wall Cond	5,903	1,789	7,692	2
Partition/Door	0		0	0
Floor	22,926		22,926	7
Adjacent Floor	0	0	0	0
Infiltration	8,587		8,587	3
Sub Total ==>	64,360	28,814	93,173	28
Internal Loads				
Lights	29,700	7,425	37,124	11
People	101,034	0	101,034	31
Misc	31,770	0	31,770	10
Sub Total ==>	162,503	7,425	169,928	52
Ceiling Load	36,239	-36,239	0	0
Ventilation Load	0	0	65,833	20
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	263,102	0	328,935	100.00

CLG SPACE PEAK

Mo/Hr: 8 / 16
OADB: 95

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	18,287	8
Glass/Door Cond	6,110	3
Wall Cond	5,999	3
Partition/Door	0	0
Floor	23,782	11
Adjacent Floor	0	0
Infiltration	7,429	3
Sub Total ==>	61,607	29
Internal Loads		
Lights	29,700	14
People	52,713	24
Misc	31,770	15
Sub Total ==>	114,183	53
Ceiling Load	39,375	18
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	215,165	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-15,591	7.78
Glass Solar	0	0	0.00
Glass/Door Cond	-11,719	-11,719	5.85
Wall Cond	-11,349	-17,415	8.69
Partition/Door	0	0	0.00
Floor	-35,829	-35,829	17.87
Adjacent Floor	0	0	0
Infiltration	-13,834	-13,834	6.90
Sub Total ==>	-72,732	-94,388	47.09
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	-21,656	0	0.00
Ventilation Load	0	-106,060	52.91
Adj Air Trans Heat	0	0	0
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
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-94,388	-200,448	100.00

TEMPERATURES

	Cooling	Heating
SADB	54.5	96.6
Ra Plenum	84.9	61.5
Return	74.0	68.0
Ret/OA	79.4	35.9
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	9,999	3,000
Terminal	9,999	3,000
Main Fan	9,999	3,000
Sec Fan	0	0
Nom Vent	2,406	2,406
AHU Vent	2,406	2,406
Infil	314	314
MinStop/Rh	3,000	3,000
Return	9,731	2,732
Exhaust	2,137	2,137
Rm Exh	582	582
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	24.1	80.2
cfm/ft²	0.96	0.29
cfm/ton	364.79	
ft²/ton	381.56	
Btu/hr·ft²	31.45	-19.17
No. People	209	

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	27.4	328.9	273.3	9,942	79.4	63.7	64.4	54.5	52.5	56.4
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	27.4	328.9								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	10,459		
Part	0		
Int Door	0		
ExFlr	9,403		
Roof	14,344	0	0
Wall	7,404	1,073	14
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-200.5	3,000	35.9	96.6
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	-200.5			

System Checksums

By P2S Engineering, Inc

66 **Bypass VAV with Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	38,882	38,882	3
Glass Solar	0	0	0	0
Glass/Door Cond	0	0	0	0
Wall Cond	104,141	24,972	129,113	9
Partition/Door	0		0	0
Floor	54,782		54,782	4
Adjacent Floor	0	0	0	0
Infiltration	45,034		45,034	3
Sub Total ==>	203,958	63,854	267,811	18
Internal Loads				
Lights	140,343	35,086	175,428	12
People	555,889	0	555,889	38
Misc	145,868	0	145,868	10
Sub Total ==>	842,100	35,086	877,185	60
Ceiling Load	23,996	-23,996	0	0
Ventilation Load	0	0	350,258	24
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-24,590	-24,590	-2
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	1,070,054	50,353	1,470,665	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 17
OADB: 95

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	0	0
Glass/Door Cond	0	0
Wall Cond	110,242	13
Partition/Door	0	0
Floor	55,753	7
Adjacent Floor	0	0
Infiltration	39,896	5
Sub Total ==>	205,891	24
Internal Loads		
Lights	140,343	17
People	322,881	38
Misc	145,868	17
Sub Total ==>	609,092	72
Ceiling Load	25,822	3
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	840,804	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-29,086	4.49
Glass Solar	0	0	0.00
Glass/Door Cond	0	0	0.00
Wall Cond	-98,688	-118,649	18.30
Partition/Door	0	0	0.00
Floor	-85,616	-85,616	13.21
Adjacent Floor	0	0	0
Infiltration	-77,440	-77,440	11.95
Sub Total ==>	-261,744	-310,792	47.94
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	-106,265	0	0.00
Ventilation Load	0	-602,296	92.91
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	142,320	142,320	-21.95
Exhaust Heat		122,500	-18.90
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-225,690	-648,267	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	85.0
Ra Plenum	75.7	60.4
Return	75.7	60.4
Ret/OA	82.8	49.4
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	40,148	12,045
Terminal	40,148	12,045
Main Fan	40,148	40,148
Sec Fan	0	0
Nom Vent	13,661	13,661
AHU Vent	13,661	13,661
Infil	1,756	1,756
MinStop/Rh	12,045	12,045
Return	39,423	41,039
Exhaust	12,935	14,552
Rm Exh	2,482	2,482
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	34.0	34.0
cfm/ft²	0.91	0.91
cfm/ton	327.59	
ft²/ton	358.30	
Btu/hr·ft²	33.49	-14.76
No. People	1,308	

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	122.6	1,470.7	1,222.9	40,148	82.8	65.3	66.5	55.0	53.1	57.8
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	122.6	1,470.7								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	43,911		
Part	0		
Int Door	0		
ExFlr	22,469		
Roof	22,469	0	0
Wall	15,420	0	0
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-398.3	12,045	55.0	85.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-250.0	40,148	49.4	55.0
Reheat	-172.6	12,045	55.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-648.3			

System Checksums

By P2S Engineering, Inc

67a **Bypass VAV with Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	27,337	27,337	3
Glass Solar	0	0	0	0
Glass/Door Cond	0	0	0	0
Wall Cond	101,619	24,129	125,748	12
Partition/Door	0		0	0
Floor	39,795		39,795	4
Adjacent Floor	0	0	0	0
Infiltration	32,628		32,628	3
Sub Total ==>	174,042	51,466	225,508	21
Internal Loads				
Lights	102,352	25,588	127,941	12
People	391,519	0	391,519	36
Misc	107,340	0	107,340	10
Sub Total ==>	601,212	25,588	626,800	58
Ceiling Load	20,609	-20,609	0	0
Ventilation Load	0	0	236,551	22
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-9,895	-9,895	-1
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	795,863	46,551	1,078,965	100.00

CLG SPACE PEAK

Mo/Hr: 8 / 18
OADB: 92

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	0	0
Glass/Door Cond	0	0
Wall Cond	110,352	18
Partition/Door	0	0
Floor	41,282	7
Adjacent Floor	0	0
Infiltration	25,463	4
Sub Total ==>	177,098	28
Internal Loads		
Lights	102,352	16
People	214,649	34
Misc	107,340	17
Sub Total ==>	424,341	68
Ceiling Load	23,481	4
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	624,920	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-20,280	4.24
Glass Solar	0	0	0.00
Glass/Door Cond	0	0	0.00
Wall Cond	-99,686	-119,039	24.91
Partition/Door	0	0	0.00
Floor	-62,194	-62,194	13.02
Adjacent Floor	0	0	0
Infiltration	-56,025	-56,025	11.72
Sub Total ==>	-217,905	-257,538	53.90
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	-89,967	0	0.00
Ventilation Load	0	-406,182	85.01
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	140,130	140,130	-29.33
Exhaust Heat		45,762	-9.58
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-167,742	-477,828	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	85.0
Ra Plenum	76.1	59.1
Return	76.1	59.1
Ret/OA	82.3	49.5
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	29,840	8,952
Terminal	29,840	8,952
Main Fan	29,840	29,840
Sec Fan	0	0
Nom Vent	9,213	9,213
AHU Vent	9,213	9,213
Infil	1,271	1,271
MinStop/Rh	8,952	8,952
Return	25,012	25,272
Exhaust	4,384	4,645
Rm Exh	6,099	6,099
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	30.9	30.9
cfm/ft²	0.94	0.94
cfm/ton	331.87	
ft²/ton	353.32	
Btu/hr·ft²	33.96	-15.04
No. People	859	

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	89.9	1,079.0	891.6	29,840	82.3	65.1	66.4	55.0	53.1	57.7
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	89.9	1,079.0								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	31,768		
Part	0		
Int Door	0		
ExFlr	16,322		
Roof	16,322	0	0
Wall	15,576	0	0
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-296.0	8,952	55.0	85.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-181.8	29,840	49.5	55.0
Reheat	-128.3	8,952	55.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-477.8			

System Checksums

By P2S Engineering, Inc

67b **Bypass VAV with Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	10,930	10,930	3
Glass Solar	0	0	0	0
Glass/Door Cond	0	0	0	0
Wall Cond	46,325	10,879	57,204	14
Partition/Door	0		0	0
Floor	16,077		16,077	4
Adjacent Floor	0	0	0	0
Infiltration	11,250		11,250	3
Sub Total ==>	73,652	21,809	95,461	24
Internal Loads				
Lights	36,325	9,081	45,406	11
People	138,478	0	138,478	35
Misc	34,149	0	34,149	9
Sub Total ==>	208,951	9,081	218,033	55
Ceiling Load	8,639	-8,639	0	0
Ventilation Load	0	0	84,378	21
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-1,419	-1,419	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	291,242	20,832	396,453	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 17
OADB: 95

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	0	0
Glass/Door Cond	0	0
Wall Cond	48,290	21
Partition/Door	0	0
Floor	16,077	7
Adjacent Floor	0	0
Infiltration	10,175	4
Sub Total ==>	74,542	33
Internal Loads		
Lights	36,325	16
People	74,588	33
Misc	34,149	15
Sub Total ==>	145,061	63
Ceiling Load	9,099	4
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	228,702	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-7,890	4.33
Glass Solar	0	0	0.00
Glass/Door Cond	0	0	0.00
Wall Cond	-45,312	-53,784	29.55
Partition/Door	0	0	0.00
Floor	-25,126	-25,126	13.80
Adjacent Floor	0	0	0
Infiltration	-19,390	-19,390	10.65
Sub Total ==>	-89,828	-106,190	58.34
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	-35,139	0	0.00
Ventilation Load	0	-145,428	79.90
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	63,579	63,579	-34.93
Exhaust Heat		6,022	-3.31
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-61,388	-182,018	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	85.0
Ra Plenum	76.5	57.9
Return	76.5	57.9
Ret/OA	82.5	48.9
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	10,921	3,276
Terminal	10,921	3,276
Main Fan	10,921	10,921
Sec Fan	0	0
Nom Vent	3,299	3,299
AHU Vent	3,299	3,299
Infil	440	440
MinStop/Rh	3,276	3,276
Return	8,141	8,164
Exhaust	519	542
Rm Exh	3,219	3,219
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	30.2	30.2
cfm/ft²	0.99	0.99
cfm/ton	330.55	
ft²/ton	332.80	
Btu/hr·ft²	36.06	-16.55
No. People	297	

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	33.0	396.5	329.2	10,921	82.5	65.2	66.5	55.0	53.1	57.8
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	33.0	396.5								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	10,995		
Part	0		
Int Door	0		
ExFlr	6,594		
Roof	6,594	0	0
Wall	7,080	0	0
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-108.3	3,276	55.0	85.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-73.7	10,921	48.9	55.0
Reheat	-46.9	3,276	55.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-182.0			

System Checksums

By P2S Engineering, Inc

System - 001 **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	71,762	71,762	3
Glass Solar	94,387	0	94,387	4
Glass/Door Cond	18,865	0	18,865	1
Wall Cond	201,835	90,439	292,274	12
Partition/Door	0		0	0
Floor	45,136		45,136	2
Adjacent Floor	0	0	0	0
Infiltration	87,307		87,307	3
Sub Total ==>	447,529	162,201	609,730	24
Internal Loads				
Lights	211,942	52,986	264,928	10
People	884,738	0	884,738	35
Misc	220,773	0	220,773	9
Sub Total ==>	1,317,453	52,986	1,370,439	54
Ceiling Load	14,831	-14,831	0	0
Ventilation Load	0	0	558,767	22
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-10,021	-10,021	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		-165,058	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	1,779,814	25,277	2,528,916	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 15
OADB: 97

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	93,485	7
Glass/Door Cond	19,065	1
Wall Cond	208,692	15
Partition/Door	0	0
Floor	45,136	3
Adjacent Floor	0	0
Infiltration	81,958	6
Sub Total ==>	448,335	32
Internal Loads		
Lights	211,942	15
People	515,401	36
Misc	220,773	16
Sub Total ==>	948,117	67
Ceiling Load	17,137	1
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	1,413,589	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-38,216	2.80
Glass Solar	0	0	0.00
Glass/Door Cond	-34,180	-34,180	2.51
Wall Cond	-166,891	-237,163	17.38
Partition/Door	0	0	0.00
Floor	-70,541	-70,541	5.17
Adjacent Floor	0	0	0
Infiltration	-142,598	-142,598	10.45
Sub Total ==>	-414,209	-522,697	38.31
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	-60,963	0	0.00
Ventilation Load	0	-912,626	66.89
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	51,095	51,095	-3.74
Exhaust Heat		41,189	-3.02
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-21,355	1.57
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-424,077	-1,364,393	100.00

TEMPERATURES

	Cooling	Heating
SADB	57.0	85.0
Ra Plenum	74.7	65.0
Return	74.7	65.0
Ret/OA	80.7	31.2
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	75,440	22,632
Terminal	75,440	22,632
Main Fan	75,440	22,632
Sec Fan	0	0
Nom Vent	20,700	20,700
AHU Vent	20,700	20,700
Infil	3,234	3,234
MinStop/Rh	22,632	22,632
Return	67,304	14,496
Exhaust	12,564	12,564
Rm Exh	11,370	11,370
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	27.4	91.5
cfm/ft²	1.17	0.35
cfm/ton	357.97	
ft²/ton	306.94	
Btu/hr·ft²	39.10	-21.09
No. People	2,087	

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	210.7	2,528.9	2,104.2	74,874	80.7	64.3	64.9	55.0	52.9	57.1
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	210.7	2,528.9								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	64,686		
Part	0		
Int Door	0		
ExFlr	23,458		
Roof	23,458	0	0
Wall	36,904	3,181	9
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-748.4	22,632	55.0	85.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-616.0	20,700	28.0	55.0
Reheat	-324.3	22,632	55.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-1,364.4			

System Checksums

By P2S Engineering, Inc

System - 001 **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	78,023	78,023	3
Glass Solar	224,916	0	224,916	8
Glass/Door Cond	42,963	0	42,963	1
Wall Cond	168,606	85,965	254,571	9
Partition/Door	0		0	0
Floor	61,384		61,384	2
Adjacent Floor	0	0	0	0
Infiltration	80,041		80,041	3
Sub Total ==>	577,909	163,989	741,898	25
Internal Loads				
Lights	220,117	55,029	275,146	9
People	369,920	0	369,920	12
Misc	204,210	0	204,210	7
Sub Total ==>	794,246	55,029	849,275	28
Ceiling Load	58,368	-58,368	0	0
Ventilation Load	0	0	1,319,146	44
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-8,629	-8,629	0
Sup. Fan Heat			84,181	3
Ret. Fan Heat		0	0	0
Duct Heat Pkup		-156,578	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	1,430,523	-4,557	2,985,871	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 15
OADB: 97

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	239,777	19
Glass/Door Cond	42,810	3
Wall Cond	159,283	13
Partition/Door	0	0
Floor	61,384	5
Adjacent Floor	0	0
Infiltration	67,829	5
Sub Total ==>	571,083	46
Internal Loads		
Lights	220,117	18
People	200,107	16
Misc	204,210	16
Sub Total ==>	624,434	50
Ceiling Load	58,735	5
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	1,254,251	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-38,542	1.91
Glass Solar	0	0	0.00
Glass/Door Cond	-80,254	-80,254	3.97
Wall Cond	-159,155	-233,943	11.57
Partition/Door	0	0	0.00
Floor	-95,934	-95,934	4.75
Adjacent Floor	0	0	0
Infiltration	-118,015	-118,015	5.84
Sub Total ==>	-453,358	-566,688	28.03
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	-113,330	0	0.00
Ventilation Load	0	-945,134	46.75
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	165,006	165,006	-8.16
Exhaust Heat		0	0.00
OA Preheat Diff.		-674,907	33.38
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-401,682	-2,021,723	100.00

TEMPERATURES

	Cooling	Heating
SADB	58.1	85.0
Ra Plenum	76.9	62.3
Return	76.9	62.3
Ret/OA	89.0	28.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	71,456	21,437
Terminal	71,456	21,437
Main Fan	71,456	21,437
Sec Fan	0	0
Nom Vent	44,115	21,437
AHU Vent	44,115	21,437
Infil	2,677	2,677
MinStop/Rh	21,437	21,437
Return	30,018	0
Exhaust	2,677	0
Rm Exh	44,115	24,114
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	61.7	100.0
cfm/ft²	1.13	0.34
cfm/ton	287.18	
ft²/ton	253.12	
Btu/hr·ft²	47.41	-32.10
No. People	797	

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	248.8	2,985.9	2,571.6	71,028	89.0	66.9	64.5	55.0	53.1	57.9
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	248.8	2,985.9								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	62,982		
Part	0		
Int Door	0		
ExFlr	25,522		
Roof	25,522	0	0
Wall	34,048	3,258	10
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-708.9	21,437	55.0	85.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-1,312.9	44,115	28.0	55.0
Reheat	-307.2	21,437	55.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-2,021.7			

System Checksums

By P2S Engineering, Inc

System - 001 — **Single Zone Variable Air Volume**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	1,064	1,064	8
Glass Solar	1,062	0	1,062	8
Glass/Door Cond	174	0	174	1
Wall Cond	6,315	1,275	7,590	61
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	200		200	2
Sub Total ==>	7,752	2,339	10,091	80
Internal Loads				
Lights	175	44	218	2
People	900	0	900	7
Misc	424	0	424	3
Sub Total ==>	1,499	44	1,543	12
Ceiling Load	2,383	-2,383	0	0
Ventilation Load	0	0	902	7
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	11,634	0	12,536	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 16
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	1,062	9
Glass/Door Cond	174	2
Wall Cond	6,315	56
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	164	1
Sub Total ==>	7,716	69
Internal Loads		
Lights	175	2
People	500	4
Misc	424	4
Sub Total ==>	1,099	10
Ceiling Load	2,383	21
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Exhaust Heat		
OA Preheat Diff.		
RA Preheat Diff.		
Additional Reheat		
Underflr Sup Ht Pkup		
Supply Air Leakage		
***Grand Total* ==>**	11,198	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-435	5.54
Glass Solar	0	0	0.00
Glass/Door Cond	-327	-327	4.17
Wall Cond	-3,984	-4,969	63.37
Partition/Door	0	0	0.00
Floor	-495	-495	6.31
Adjacent Floor	0	0	0
Infiltration	-294	-294	3.74
Sub Total ==>	-5,100	-6,520	83.13
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	-1,420	0	0.00
Ventilation Load	0	-1,323	16.87
Adj Air Trans Heat	0	0	0
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
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-6,520	-7,842	100.00

TEMPERATURES

	Cooling	Heating
SADB	58.0	99.1
Ra Plenum	124.8	37.7
Return	74.0	68.0
Ret/OA	75.1	61.7
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	635	190
Terminal	635	190
Main Fan	635	190
Sec Fan	0	0
Nom Vent	30	30
AHU Vent	30	30
Infil	7	7
MinStop/Rh	190	190
Return	642	197
Exhaust	37	37
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	4.7	15.7
cfm/ft²	4.29	1.29
cfm/ton	607.84	
ft²/ton	141.68	
Btu/hr·ft²	84.70	-52.99
No. People	2	

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	1.0	12.5	11.9	635	75.1	61.3	60.0	58.0	54.5	58.6
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	1.0	12.5								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	148		
Part	0		
Int Door	0		
ExFlr	25		
Roof	148	0	0
Wall	435	16	4
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-7.8	190	61.7	99.1
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	-7.8			

System Checksums

By P2S Engineering, Inc.

AC-1 (1st North) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	18,024	0	18,024	3.34
Glass Cond	4,197	0	4,197	0.78
Wall Cond	45,189	16,889	62,078	11.52
Partition	1,787		1,787	0.33
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	69,196	16,889	86,085	15.97
Internal Loads				
Lights	44,261	11,065	55,326	10.26
People	178,201		178,201	33.06
Misc	24,589	0	24,589	4.56
Sub Total ==>	247,051	11,065	258,116	47.88
Ceiling Load	5,909	-5,909	0	0.00
Ventilation Load	0	0	194,068	36.00
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-11,396	-11,396	-2.11
Sup. Fan Heat			12,174	2.26
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
Grand Total ==>	322,156	10,649	539,046	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	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	14,588	5.97
Glass Cond	4,120	1.69
Wall Cond	48,656	19.92
Partition	1,967	0.81
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	69,331	28.38
Internal Loads		
Lights	44,261	18.12
People	99,939	40.91
Misc	24,589	10.07
Sub Total ==>	168,789	69.09
Ceiling Load	6,174	2.53
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
Grand Total ==>	244,293	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-8,561	-8,561	1.78
Wall Cond	-67,625	-93,092	19.41
Partition	-2,025	-2,025	0.42
Exposed Floor	0	0	0.00
Infiltration	-2	-2	0.00
Sub Total ==>	-78,212	-103,679	21.61
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	-7,978	0	0.00
Ventilation Load	0	-241,294	50.30
Ov/Undr Sizing	-136,167	-136,167	28.39
Exhaust Heat		15,388	-3.21
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-13,927	2.90
Additional Reheat		0	0.00
Grand Total ==>	-222,357	-479,679	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	100.0
Plenum	73.8	67.6
Return	73.8	67.6
Ret/OA	83.0	37.2
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	6,073	6,073
Infil	0	0
Supply	11,758	6,902
MinStop/Rh	0	0
Return	11,758	6,902
Exhaust	6,073	6,073
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	51.7	88.0
cfm/ft²	1.10	0.65
cfm/ton	261.76	
ft²/ton	237.55	
Btu/hr·ft²	50.52	-44.98
No. People	401	

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	44.9	539.1	394.9	11,739	83.3	66.0	71.5	52.0	50.3	53.5
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	44.9	539.1								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	10,671		
Part	1,206		
ExFlr	0		
Roof	0	0	0
Wall	6,497	232	4

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-358.1	6,902	51.7	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-121.9	6,073	33.0	51.7
Reheat	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	-480.0			

System Checksums

By P2S Engineering, Inc.

AC-2 (2nd North) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	21,712	0	21,712	3.45
Glass Cond	3,974	0	3,974	0.63
Wall Cond	57,999	21,753	79,753	12.67
Partition	3,241		3,241	0.51
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	86,927	21,753	108,680	17.26
Internal Loads				
Lights	49,648	12,412	62,061	9.86
People	205,938		205,938	32.71
Misc	28,667	0	28,667	4.55
Sub Total ==>	284,254	12,412	296,666	47.12
Ceiling Load	6,965	-6,965	0	0.00
Ventilation Load	0	0	223,591	35.52
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-13,699	-13,699	-2.18
Sup. Fan Heat			14,324	2.28
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
***Grand Total* ==>**	378,145	13,502	629,561	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	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	18,782	6.48
Glass Cond	3,901	1.35
Wall Cond	63,347	21.84
Partition	3,568	1.23
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	89,598	30.89
Internal Loads		
Lights	49,648	17.12
People	114,761	39.57
Misc	28,667	9.89
Sub Total ==>	193,077	66.58
Ceiling Load	7,334	2.53
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	290,009	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-8,111	-8,111	1.45
Wall Cond	-84,930	-116,913	20.89
Partition	-3,672	-3,672	0.66
Exposed Floor	0	0	0.00
Infiltration	-2	-2	0.00
Sub Total ==>	-96,715	-128,698	23.00
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	-9,732	0	0.00
Ventilation Load	0	-276,859	49.47
Ov/Undr Sizing	-154,464	-154,464	27.60
Exhaust Heat		19,143	-3.42
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-18,752	3.35
Additional Reheat		0	0.00
***Grand Total* ==>**	-260,912	-559,630	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	100.0
Plenum	73.8	67.4
Return	73.8	67.4
Ret/OA	82.8	37.8
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	6,968	6,968
Infil	0	0
Supply	13,959	8,099
MinStop/Rh	0	0
Return	13,959	8,099
Exhaust	6,968	6,968
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	49.9	86.0
cfm/ft²	1.16	0.67
cfm/ton	266.06	
ft²/ton	228.85	
Btu/hr·ft²	52.44	-46.64
No. People	459	

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	52.5	629.6	461.9	13,812	83.1	65.8	71.2	52.0	50.2	53.4
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	52.5	629.6								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	12,006		
Part	1,932		
ExFlr	0		
Roof	0	0	0
Wall	8,099	218	3

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-420.2	8,099	51.7	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-139.8	6,968	33.0	51.7
Reheat	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	-560.0			

System Checksums

By P2S Engineering, Inc.

AC-3 (3rd North) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	106,987	106,987	14.10
Glass Solar	17,807	0	17,807	2.35
Glass Cond	3,592	0	3,592	0.47
Wall Cond	58,668	17,464	76,132	10.04
Partition	3,241		3,241	0.43
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	83,308	124,451	207,758	27.39
Internal Loads				
Lights	52,076	13,019	65,094	8.58
People	243,450		243,450	32.09
Misc	25,598	0	25,598	3.37
Sub Total ==>	321,123	13,019	334,142	44.05
Ceiling Load	25,822	-25,822	0	0.00
Ventilation Load	0	0	259,487	34.21
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-58,854	-58,854	-7.76
Sup. Fan Heat			16,075	2.12
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
***Grand Total* ==>**	430,253	52,794	758,609	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	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	14,869	4.54
Glass Cond	3,526	1.08
Wall Cond	64,271	19.63
Partition	3,568	1.09
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	86,234	26.33
Internal Loads		
Lights	52,076	15.90
People	135,250	41.30
Misc	25,598	7.82
Sub Total ==>	212,923	65.02
Ceiling Load	28,314	8.65
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	327,472	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-73,983	11.78
Glass Solar	0	0	0.00
Glass Cond	-7,340	-7,340	1.17
Wall Cond	-86,009	-113,600	18.08
Partition	-3,672	-3,672	0.58
Exposed Floor	0	0	0.00
Infiltration	-2	-2	0.00
Sub Total ==>	-97,022	-198,596	31.61
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	-29,067	0	0.00
Ventilation Load	0	-324,979	51.73
Ov/Undr Sizing	-162,285	-162,285	25.83
Exhaust Heat		66,251	-10.54
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-8,672	1.38
Additional Reheat		0	0.00
***Grand Total* ==>**	-288,375	-628,281	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	100.0
Plenum	78.7	62.5
Return	78.7	62.5
Ret/OA	85.5	35.5
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	8,179	8,179
Infil	0	0
Supply	15,762	8,952
MinStop/Rh	0	0
Return	15,762	8,952
Exhaust	8,179	8,179
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	51.9	91.4
cfm/ft²	1.30	0.74
cfm/ton	249.33	
ft²/ton	192.38	
Btu/hr·ft²	62.38	-51.68
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	63.2	758.6	563.6	15,501	85.9	66.8	71.8	52.0	50.2	53.3
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	63.2	758.6								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	12,162		
Part	1,932		
ExFlr	0		
Roof	12,162	0	0
Wall	8,166	194	2

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-464.4	8,952	51.7	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-164.1	8,179	33.0	51.7
Reheat	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	-628.5			

System Checksums

By P2S Engineering, Inc.

AC-4 (Ground South) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 15
Outside Air: OADB/WB/HR: 94 / 70 / 77

	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	4,300	0	4,300	0.88
Glass Cond	1,788	0	1,788	0.36
Wall Cond	17,114	6,259	23,373	4.77
Partition	3,423		3,423	0.70
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	26,625	6,259	32,883	6.71
Internal Loads				
Lights	49,257	12,314	61,572	12.57
People	184,050		184,050	37.58
Misc	17,065	0	17,065	3.48
Sub Total ==>	250,372	12,314	262,687	53.63
Ceiling Load	4,997	-4,997	0	0.00
Ventilation Load	0	0	193,144	39.43
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-8,917	-8,917	-1.82
Sup. Fan Heat			9,993	2.04
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
***Grand Total* ==>**	281,994	4,659	489,790	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 19
OADB: 85

	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	0	0.00
Glass Cond	1,047	0.50
Wall Cond	29,725	14.18
Partition	4,176	1.99
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	34,948	16.67
Internal Loads		
Lights	49,257	23.49
People	102,250	48.77
Misc	17,065	8.14
Sub Total ==>	168,572	80.41
Ceiling Load	6,132	2.92
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	209,653	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 2
OADB: 33

	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	-3,231	-3,231	0.83
Wall Cond	-26,242	-36,162	9.26
Partition	-8,951	-8,951	2.29
Exposed Floor	0	0	0.00
Infiltration	-1	-1	0.00
Sub Total ==>	-38,425	-48,345	12.37
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	-3,354	0	0.00
Ventilation Load	0	-251,854	64.46
Ov/Undr Sizing	-85,182	-85,182	21.80
Exhaust Heat		5,985	-1.53
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-11,324	2.90
Additional Reheat		0	0.00
***Grand Total* ==>**	-126,961	-390,720	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	87.0
Plenum	73.3	69.1
Return	73.3	69.1
Ret/OA	86.9	36.2
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	6,339	6,339
Infil	0	0
Supply	10,091	6,955
MinStop/Rh	0	0
Return	10,091	6,955
Exhaust	6,339	6,339
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	62.8	91.1
cfm/ft²	0.84	0.58
cfm/ton	247.23	
ft²/ton	294.98	
Btu/hr·ft²	40.68	-32.47
No. People	409	

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	40.8	489.8	364.3	9,636	87.2	67.6	73.7	52.0	50.6	54.6
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	40.8	489.8								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	12,040		
Part	1,598		
ExFlr	0		
Roof	0	0	0
Wall	2,505	100	4

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-263.7	6,955	51.7	87.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-127.2	6,339	33.0	51.7
Reheat	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	-390.9			

System Checksums

By P2S Engineering, Inc.

AC-5 (1st South) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	20,383	0	20,383	6.44
Glass Cond	7,187	0	7,187	2.27
Wall Cond	45,329	17,338	62,666	19.79
Partition	715		715	0.23
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	73,614	17,338	90,952	28.73
Internal Loads				
Lights	36,762	9,191	45,953	14.51
People	50,634		50,634	15.99
Misc	54,876	0	54,876	17.33
Sub Total ==>	142,272	9,191	151,463	47.84
Ceiling Load	6,377	-6,377	0	0.00
Ventilation Load	0	0	67,997	21.48
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-3,780	-3,780	-1.19
Sup. Fan Heat			9,971	3.15
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
***Grand Total* ==>**	222,263	16,372	316,603	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 17
OADB: 94

	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	21,920	10.92
Glass Cond	8,152	4.06
Wall Cond	43,875	21.87
Partition	738	0.37
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	74,685	37.22
Internal Loads		
Lights	36,762	18.32
People	28,130	14.02
Misc	54,876	27.35
Sub Total ==>	119,768	59.69
Ceiling Load	6,207	3.09
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	200,661	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-14,626	-14,626	6.63
Wall Cond	-66,888	-91,997	41.72
Partition	-810	-810	0.37
Exposed Floor	0	0	0.00
Infiltration	-4	-4	0.00
Sub Total ==>	-82,329	-107,438	48.72
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	-11,595	0	0.00
Ventilation Load	0	-71,963	32.63
Ov/Undr Sizing	-20,806	-20,806	9.43
Exhaust Heat		6,872	-3.12
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-27,189	12.33
Additional Reheat		0	0.00
***Grand Total* ==>**	-114,731	-220,524	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	100.0
Plenum	73.9	66.5
Return	73.9	66.5
Ret/OA	77.3	49.5
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	1,811	1,811
Infil	0	0
Supply	9,658	3,561
MinStop/Rh	0	0
Return	9,658	3,561
Exhaust	1,811	1,811
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	18.8	50.9
cfm/ft²	0.93	0.34
cfm/ton	366.07	
ft²/ton	392.56	
Btu/hr·ft²	30.57	-21.35
No. People	113	

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	26.4	316.6	264.3	9,615	77.6	61.6	59.5	52.0	49.7	51.4
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	26.4	316.6								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	10,357		
Part	357		
ExFlr	0		
Roof	0	0	0
Wall	6,662	409	6

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-184.8	3,561	51.7	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-36.3	1,811	33.0	51.7
Reheat	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	-221.1			

System Checksums

By P2S Engineering, Inc.

AC-6 (2nd South) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	23,167	0	23,167	3.84
Glass Cond	5,808	0	5,808	0.96
Wall Cond	61,614	23,395	85,009	14.07
Partition	3,431		3,431	0.57
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	94,021	23,395	117,416	19.44
Internal Loads				
Lights	47,831	11,958	59,788	9.90
People	182,750		182,750	30.26
Misc	37,767	0	37,767	6.25
Sub Total ==>	268,347	11,958	280,304	46.41
Ceiling Load	7,201	-7,201	0	0.00
Ventilation Load	0	0	204,511	33.86
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-12,611	-12,611	-2.09
Sup. Fan Heat			14,393	2.38
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
Grand Total ==>	369,568	15,541	604,014	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	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	19,795	6.82
Glass Cond	5,702	1.96
Wall Cond	66,441	22.88
Partition	3,778	1.30
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	95,716	32.96
Internal Loads		
Lights	47,831	16.47
People	101,528	34.96
Misc	37,767	13.01
Sub Total ==>	187,125	64.44
Ceiling Load	7,537	2.60
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
Grand Total ==>	290,377	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-11,843	-11,843	2.20
Wall Cond	-87,095	-120,162	22.28
Partition	-3,888	-3,888	0.72
Exposed Floor	0	0	0.00
Infiltration	-3	-3	0.00
Sub Total ==>	-102,829	-135,896	25.20
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	-10,164	0	0.00
Ventilation Load	0	-247,094	45.81
Ov/Undr Sizing	-144,795	-144,795	26.85
Exhaust Heat		17,800	-3.30
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-29,361	5.44
Additional Reheat		0	0.00
Grand Total ==>	-257,787	-539,346	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	100.0
Plenum	73.9	67.3
Return	73.9	67.3
Ret/OA	81.9	40.7
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	6,219	6,219
Infil	0	0
Supply	13,976	8,002
MinStop/Rh	0	0
Return	13,976	8,002
Exhaust	6,219	6,219
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	44.5	77.7
cfm/ft²	1.16	0.66
cfm/ton	277.67	
ft²/ton	239.10	
Btu/hr·ft²	50.19	-44.86
No. People	406	

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	50.3	604.0	449.6	13,879	82.2	65.2	69.6	52.0	50.2	53.3
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	50.3	604.0								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	12,035		
Part	2,017		
ExFlr	0		
Roof	0	0	0
Wall	8,431	323	4

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-415.2	8,002	51.7	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-124.8	6,219	33.0	51.7
Reheat	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	-540.0			

System Checksums

By P2S Engineering, Inc.

AC-7 (3rd South) **Double Duct VAV**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	106,952	106,952	13.69
Glass Solar	18,841	0	18,841	2.41
Glass Cond	5,235	0	5,235	0.67
Wall Cond	61,649	19,220	80,869	10.35
Partition	1,649		1,649	0.21
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	87,374	126,172	213,547	27.34
Internal Loads				
Lights	51,432	12,858	64,290	8.23
People	215,100		215,100	27.54
Misc	77,578	0	77,578	9.93
Sub Total ==>	344,110	12,858	356,968	45.70
Ceiling Load	23,609	-23,609	0	0.00
Ventilation Load	0	0	240,757	30.83
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-48,172	-48,172	-6.17
Sup. Fan Heat			17,944	2.30
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
***Grand Total* ==>**	455,093	67,249	781,044	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	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	15,745	4.33
Glass Cond	5,139	1.41
Wall Cond	66,353	18.26
Partition	1,816	0.50
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	89,053	24.50
Internal Loads		
Lights	51,432	14.15
People	119,500	32.88
Misc	77,578	21.34
Sub Total ==>	248,510	68.37
Ceiling Load	25,911	7.13
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	363,474	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-71,998	12.77
Glass Solar	0	0	0.00
Glass Cond	-10,686	-10,686	1.90
Wall Cond	-86,867	-114,514	20.32
Partition	-1,869	-1,869	0.33
Exposed Floor	0	0	0.00
Infiltration	-2	-2	0.00
Sub Total ==>	-99,423	-199,067	35.32
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	-30,414	0	0.00
Ventilation Load	0	-287,457	51.00
Ov/Undr Sizing	-130,185	-130,185	23.10
Exhaust Heat		62,056	-11.01
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-8,994	1.60
Additional Reheat		0	0.00
***Grand Total* ==>**	-260,022	-563,649	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.7	100.0
Plenum	78.2	62.0
Return	78.2	62.0
Ret/OA	83.8	36.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	7,235	7,235
Infil	0	0
Supply	17,495	8,072
MinStop/Rh	0	0
Return	17,495	8,072
Exhaust	7,235	7,235
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	41.4	89.6
cfm/ft²	1.46	0.67
cfm/ton	268.79	
ft²/ton	184.63	
Btu/hr·ft²	64.99	-46.93
No. People	478	

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	65.1	781.0	597.4	17,303	84.1	65.7	68.8	52.0	50.2	53.1
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	65.1	781.0								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	12,017		
Part	823		
ExFlr	0		
Roof	12,017	0	0
Wall	8,356	287	3

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-418.8	8,072	51.7	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-145.2	7,235	33.0	51.7
Reheat	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	-563.9			

System Checksums

By P2S Engineering, Inc.

AC-9 (1st Central) **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 18
Outside Air: OADB/WB/HR: 89 / 70 / 81

	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	43,490	43,490	11.04
Glass Solar	9,259	0	9,259	2.35
Glass Cond	3,142	0	3,142	0.80
Wall Cond	23,607	9,165	32,771	8.32
Partition	0		0	0.00
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	36,008	52,654	88,662	22.50
Internal Loads				
Lights	23,056	5,764	28,820	7.31
People	89,420		89,420	22.69
Misc	90,388	0	90,388	22.94
Sub Total ==>	202,864	5,764	208,628	52.94
Ceiling Load	8,177	-8,177	0	0.00
Ventilation Load	0	0	101,039	25.64
Ov/Undr Sizing	0		0	0.00
Exhaust Heat		-14,776	-14,776	-3.75
Sup. Fan Heat			10,518	2.67
Ret. Fan Heat		0	0	0.00
Duct Heat Pkup		0	0	0.00
Reheat at Design			0	0.00
***Grand Total* ==>**	247,049	35,465	394,072	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	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	8,620	4.16
Glass Cond	3,534	1.70
Wall Cond	23,455	11.31
Partition	0	0.00
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	35,609	17.17
Internal Loads		
Lights	23,056	11.11
People	49,678	23.95
Misc	90,388	43.57
Sub Total ==>	163,122	78.64
Ceiling Load	8,704	4.20
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	207,434	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-27,627	12.41
Glass Solar	0	0	0.00
Glass Cond	-7,265	-7,265	3.26
Wall Cond	-31,346	-42,853	19.25
Partition	0	0	0.00
Exposed Floor	0	0	0.00
Infiltration	-1	-1	0.00
Sub Total ==>	-38,612	-77,746	34.92
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	-13,479	0	0.00
Ventilation Load	0	-102,282	45.94
Ov/Undr Sizing	-49,052	-49,052	22.03
Exhaust Heat		21,036	-9.45
OA Preheat Diff.		-8,289	3.72
RA Preheat Diff.		-6,307	2.83
Additional Reheat		0	0.00
***Grand Total* ==>**	-101,143	-222,641	100.00

TEMPERATURES

	Cooling	Heating
SADB	53.0	100.0
Plenum	76.6	62.4
Return	76.6	62.4
Ret/OA	80.3	38.3
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Vent	2,981	2,574
Infil	0	0
Supply	10,149	3,140
MinStop/Rh	3,140	3,140
Return	10,149	3,140
Exhaust	2,981	2,574
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	29.4	82.0
cfm/ft²	1.82	0.56
cfm/ton	309.04	
ft²/ton	170.22	
Btu/hr·ft²	70.50	-39.83
No. People	199	

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	32.8	394.1	308.2	10,143	80.3	63.7	65.1	52.0	50.0	52.6
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	32.8	394.1								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	5,590		
Part	0		
ExFlr	0		
Roof	4,552	0	0
Wall	3,254	226	7

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-161.8	3,140	52.0	100.0
Aux Htg	0.0	0	0.0	0.0
Preheat	-60.8	2,981	33.0	52.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-222.6			

System Checksums

By P2S Engineering, Inc.

FC-1 **Fan Coil**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 20
Outside Air: OADB/WB/HR: 82 / 66 / 76

	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	4,111	867	4,978	68.79
Partition	0		0	0.00
Exposed Floor	0		0	0.00
Infiltration	0		0	0.00
Sub Total ==>	4,111	867	4,978	68.79
Internal Loads				
Lights	550	138	688	9.50
People	698		698	9.64
Misc	265	0	265	3.66
Sub Total ==>	1,512	138	1,650	22.80
Ceiling Load	1,004	-1,004	0	0.00
Ventilation Load	0	0	608	8.41
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* ==>**	6,628	0	7,236	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 20
OADB: 82

	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	0	0.00
Glass Cond	0	0.00
Wall Cond	4,111	65.08
Partition	0	0.00
Exposed Floor	0	0.00
Infiltration	0	0.00
Sub Total ==>	4,111	65.08
Internal Loads		
Lights	550	8.71
People	388	6.13
Misc	265	4.19
Sub Total ==>	1,202	19.03
Ceiling Load	1,004	15.90
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	6,318	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	0	0	0.00
Wall Cond	-3,676	-4,507	82.99
Partition	0	0	0.00
Exposed Floor	0	0	0.00
Infiltration	0	0	0.00
Sub Total ==>	-3,676	-4,507	82.99
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	-831	0	0.00
Ventilation Load	0	-924	17.01
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* ==>**	-4,507	-5,431	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.0	84.3
Plenum	92.5	53.1
Return	72.0	70.0
Ret/OA	72.8	67.1
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Vent	23	23
Infil	0	0
Supply	294	294
MinStop/Rh	0	0
Return	294	294
Exhaust	23	23
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	7.9	7.9
cfm/ft²	1.90	1.90
cfm/ton	487.84	
ft²/ton	257.04	
Btu/hr·ft²	46.69	-35.04
No. People	2	

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	0.6	7.2	6.6	294	72.8	58.7	54.2	52.0	49.5	50.6
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	0.6	7.2								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	155		
Part	0		
ExFlr	0		
Roof	0	0	0
Wall	344	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-5.4	294	67.1	84.3
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	-5.4			

System Checksums

By P2S Engineering, Inc.

FC-2 **Fan Coil**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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	862	862	10.63
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	862	862	10.63
Internal Loads				
Lights	601	150	751	9.26
People	2,102		2,102	25.92
Misc	2,183	0	2,183	26.92
Sub Total ==>	4,885	150	5,035	62.10
Ceiling Load	1,036	-1,036	0	0.00
Ventilation Load	0	0	2,211	27.26
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* ==>**	5,921	-24	8,108	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 19
OADB: 88

	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	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
Internal Loads		
Lights	601	11.80
People	1,168	22.94
Misc	2,183	42.88
Sub Total ==>	3,951	77.62
Ceiling Load	1,139	22.37
Ventilation Load	0	0.00
Ov/Undr Sizing	0	0.00
***Grand Total* ==>**	5,090	100.00

HEATING COIL PEAK

Mo/Hr: 13 / 1
OADB: 33

	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	-699	20.06
Glass Solar	0	0	0.00
Glass Cond	0	0	0.00
Wall Cond	0	0	0.00
Partition	0	0	0.00
Exposed Floor	0	0	0.00
Infiltration	0	0	0.00
Sub Total ==>	0	-699	20.07
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	-699	0	0.00
Ventilation Load	0	-2,783	79.93
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* ==>**	-699	-3,482	100.00

TEMPERATURES

	Cooling	Heating
SADB	52.0	72.8
Plenum	93.7	55.4
Return	72.0	70.0
Ret/OA	77.8	59.1
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Vent	70	70
Infil	0	0
Supply	237	237
MinStop/Rh	0	0
Return	237	237
Exhaust	70	70
Rm Exh	0	0
Auxiliary	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	29.6	29.6
cfm/ft²	1.57	1.57
cfm/ton	350.76	
ft²/ton	223.49	
Btu/hr·ft²	53.69	-23.06
No. People	5	

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	0.7	8.1	6.4	237	77.8	62.6	63.7	52.0	50.4	54.1
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	0.7	8.1								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	151		
Part	0		
ExFlr	0		
Roof	151	0	0
Wall	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-3.5	237	59.1	72.8
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	-3.5			

System Checksums

By P2S Engineering, Inc

System - 001 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	156,424	156,424	8
Glass Solar	142,896	0	142,896	7
Glass/Door Cond	28,948	0	28,948	1
Wall Cond	40,178	24,000	64,178	3
Partition/Door	0		0	0
Floor	94,845		94,845	5
Adjacent Floor	0	0	0	0
Infiltration	91,946		91,946	5
Sub Total ==>	398,814	180,424	579,238	30
Internal Loads				
Lights	237,371	59,343	296,713	15
People	362,570	0	362,570	19
Misc	182,593	0	182,593	9
Sub Total ==>	782,533	59,343	841,876	43
Ceiling Load	52,172	-52,172	0	0
Ventilation Load	0	0	594,653	30
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-63,268	-63,268	-3
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	1,233,519	124,326	1,952,499	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 14
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	182,637	17
Glass/Door Cond	27,353	2
Wall Cond	33,091	3
Partition/Door	0	0
Floor	94,845	9
Adjacent Floor	0	0
Infiltration	82,519	7
Sub Total ==>	420,445	38
Internal Loads		
Lights	237,371	21
People	200,622	18
Misc	182,593	17
Sub Total ==>	620,585	56
Ceiling Load	63,163	6
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	1,104,193	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-58,945	4.28
Glass Solar	0	0	0.00
Glass/Door Cond	-52,609	-52,609	3.82
Wall Cond	-42,947	-69,144	5.02
Partition/Door	0	0	0.00
Floor	-148,229	-148,229	10.76
Adjacent Floor	0	0	0
Infiltration	-147,421	-147,421	10.70
Sub Total ==>	-391,206	-476,348	34.56
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	-39,024	0	0.00
Ventilation Load	0	-927,221	67.28
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		46,117	-3.35
OA Preheat Diff.		-20,776	1.51
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-430,231	-1,378,228	100.00

TEMPERATURES

	Cooling	Heating
SADB	59.7	86.6
Ra Plenum	76.5	66.2
Return	76.5	66.2
Ret/OA	82.9	28.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	70,102	21,031
Terminal	70,102	21,031
Main Fan	70,102	21,031
Sec Fan	0	0
Nom Vent	21,625	21,031
AHU Vent	21,625	21,031
Infil	3,344	3,344
MinStop/Rh	21,031	21,031
Return	71,790	22,718
Exhaust	23,313	22,718
Rm Exh	1,656	1,656
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	30.8	100.0
cfm/ft²	1.05	0.31
cfm/ton	430.84	
ft²/ton	411.01	
Btu/hr·ft²	29.20	-20.61
No. People	806	

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	162.7	1,952.5	1,720.2	67,432	82.9	64.9	64.6	59.7	55.5	59.6
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	162.7	1,952.5								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	66,874		
Part	0		
Int Door	0		
ExFlr	38,901		
Roof	38,901	0	0
Wall	18,004	4,815	27
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-622.4	21,031	59.7	86.6
Aux Htg	0.0	0	0.0	0.0
Preheat	-755.8	21,625	28.0	59.7
Reheat	-192.2	21,031	59.7	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-1,378.2			

System Checksums

By P2S Engineering, Inc

AHU-1 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 15
Outside Air: OADB/WB/HR: 94 / 70 / 75

	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
Skylite Cond	0	0	0	0
Roof Cond	0	23,074	23,074	6
Glass Solar	18,014	0	18,014	5
Glass/Door Cond	6,170	0	6,170	2
Wall Cond	8,268	357	8,625	2
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	32,452	23,431	55,883	15
Internal Loads				
Lights	24,220	6,055	30,275	8
People	104,235	0	104,235	28
Misc	22,884	0	22,884	6
Sub Total ==>	151,339	6,055	157,394	42
Ceiling Load	29,448	-29,448	0	0
Ventilation Load	0	0	137,688	37
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-4,289	-4,289	-1
Sup. Fan Heat			18,317	5
Ret. Fan Heat		6,869	6,869	2
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	213,238	2,618	371,862	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 15
OADB: 93

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	23,534	14
Glass/Door Cond	5,858	3
Wall Cond	8,057	5
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	37,449	22
Internal Loads		
Lights	24,220	14
People	57,718	34
Misc	22,884	14
Sub Total ==>	104,821	62
Ceiling Load	26,926	16
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Exhaust Heat		
OA Preheat Diff.		
RA Preheat Diff.		
Additional Reheat		
Underflr Sup Ht Pkup		
Supply Air Leakage		
Grand Total ==>	169,196	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 33

	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	-10,011	4.87
Glass Solar	0	0	0.00
Glass/Door Cond	-14,925	-14,925	7.26
Wall Cond	-21,912	-29,066	14.15
Partition/Door	0	0	0.00
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-36,837	-54,002	26.28
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	-17,164	0	0.00
Ventilation Load	0	-103,310	50.28
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		-47,779	23.25
RA Preheat Diff.		-373	0.18
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-54,002	-205,463	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	89.2
Ra Plenum	87.6	62.7
Return	75.8	70.0
Ret/OA	87.1	33.3
Fn MtrTD	0.2	0.0
Fn BldTD	0.5	0.0
Fn Frict	1.5	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	7,842	2,608
Terminal	7,842	2,608
Main Fan	7,842	2,608
Sec Fan	0	0
Nom Vent	4,825	2,588
AHU Vent	4,825	2,588
Infil	0	0
MinStop/Rh	2,608	2,608
Return	7,842	2,608
Exhaust	4,825	2,588
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	61.5	99.2
cfm/ft²	1.06	0.35
cfm/ton	253.07	
ft²/ton	238.54	
Btu/hr·ft²	50.31	-27.80
No. People	231	

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	31.0	371.9	285.9	7,728	87.1	67.1	70.8	52.8	51.0	54.5
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	31.0	371.9								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	7,392		
Part	0		
Int Door	0		
ExFlr	0		
Roof	7,392	0	0
Wall	7,606	790	10
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-102.4	2,608	52.8	89.2
Aux Htg	0.0	0	0.0	0.0
Preheat	-103.1	4,825	33.0	52.8
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-205.5			

System Checksums

By P2S Engineering, Inc

AHU-2 East — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 14
Outside Air: OADB/WB/HR: 93 / 70 / 77

	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
Skylite Cond	0	0	0	0
Roof Cond	0	3,924	3,924	4
Glass Solar	1,098	0	1,098	1
Glass/Door Cond	398	0	398	0
Wall Cond	2,180	192	2,372	2
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	3,677	4,116	7,792	8
Internal Loads				
Lights	4,374	1,094	5,468	6
People	42,750	0	42,750	45
Misc	4,556	0	4,556	5
Sub Total ==>	51,680	1,094	52,774	55
Ceiling Load	5,209	-5,209	0	0
Ventilation Load	0	0	33,430	35
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			1,484	2
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	60,566	0	95,481	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 16
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	935	2
Glass/Door Cond	482	1
Wall Cond	2,401	6
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	3,818	9
Internal Loads		
Lights	4,374	10
People	23,750	56
Misc	4,556	11
Sub Total ==>	32,680	77
Ceiling Load	5,707	14
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	42,206	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 33

	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	-1,788	3.44
Glass Solar	0	0	0.00
Glass/Door Cond	-1,023	-1,023	1.97
Wall Cond	-4,981	-6,432	12.39
Partition/Door	0	0	0.00
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-6,004	-9,243	17.80
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	-3,239	0	0.00
Ventilation Load	0	-23,424	45.12
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		-19,245	37.07
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-9,243	-51,912	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	84.6
Ra Plenum	87.3	62.3
Return	75.0	70.0
Ret/OA	88.5	33.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.5	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	1,956	587
Terminal	1,956	587
Main Fan	1,956	587
Sec Fan	0	0
Nom Vent	1,425	587
AHU Vent	1,425	587
Infil	0	0
MinStop/Rh	587	587
Return	1,956	587
Exhaust	1,425	587
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	72.8	100.0
cfm/ft²	1.47	0.44
cfm/ton	245.86	
ft²/ton	167.78	
Btu/hr·ft²	71.52	-38.89
No. People	95	

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	8.0	95.5	71.0	1,927	88.5	68.4	75.3	54.3	52.2	56.8
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	8.0	95.5								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	1,335		
Part	0		
Int Door	0		
ExFlr	0		
Roof	1,335	0	0
Wall	1,560	54	3
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-19.2	587	54.3	84.6
Aux Htg	0.0	0	0.0	0.0
Preheat	-32.7	1,425	33.0	54.3
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-51.9			

System Checksums

By P2S Engineering, Inc

AHU-3 West — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 14
Outside Air: OADB/WB/HR: 93 / 70 / 77

	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
Skylite Cond	0	0	0	0
Roof Cond	0	3,910	3,910	4
Glass Solar	1,103	0	1,103	1
Glass/Door Cond	398	0	398	0
Wall Cond	2,098	154	2,252	3
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	3,599	4,064	7,663	9
Internal Loads				
Lights	4,358	1,089	5,447	6
People	39,600	0	39,600	44
Misc	4,539	0	4,539	5
Sub Total ==>	48,497	1,089	49,586	56
Ceiling Load	5,153	-5,153	0	0
Ventilation Load	0	0	30,667	34
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			1,416	2
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	57,249	0	89,331	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 15
OADB: 97

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	988	2
Glass/Door Cond	487	1
Wall Cond	2,151	5
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	3,625	9
Internal Loads		
Lights	4,358	11
People	22,000	55
Misc	4,539	11
Sub Total ==>	30,897	77
Ceiling Load	5,612	14
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	40,134	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 33

	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	-1,778	3.62
Glass Solar	0	0	0.00
Glass/Door Cond	-1,023	-1,023	2.08
Wall Cond	-5,075	-6,549	13.33
Partition/Door	0	0	0.00
Floor	0	0	0.00
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-6,098	-9,349	19.03
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	-3,251	0	0.00
Ventilation Load	0	-22,274	45.35
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		-17,495	35.62
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-9,349	-49,119	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	85.5
Ra Plenum	87.2	62.3
Return	75.0	70.0
Ret/OA	88.1	33.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.5	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	1,860	558
Terminal	1,860	558
Main Fan	1,860	558
Sec Fan	0	0
Nom Vent	1,320	558
AHU Vent	1,320	558
Infil	0	0
MinStop/Rh	558	558
Return	1,860	558
Exhaust	1,320	558
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	71.0	100.0
cfm/ft²	1.40	0.42
cfm/ton	249.89	
ft²/ton	178.66	
Btu/hr·ft²	67.17	-36.93
No. People	88	

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	7.4	89.3	67.0	1,838	88.1	68.2	75.3	54.3	52.4	57.6
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	7.4	89.3								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	1,330		
Part	0		
Int Door	0		
ExFlr	0		
Roof	1,330	0	0
Wall	1,588	54	3
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-18.8	558	54.3	85.5
Aux Htg	0.0	0	0.0	0.0
Preheat	-30.3	1,320	33.0	54.3
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-49.1			

System Checksums

By P2S ENGINEERING, INC

Bldg 11 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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
Skylite Cond	0	0	0	0
Roof Cond	0	129,759	129,759	10
Glass Solar	36,365	0	36,365	3
Glass/Door Cond	19,935	0	19,935	2
Wall Cond	61,698	15,986	77,683	6
Partition/Door	7,203		7,203	1
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	125,201	145,745	270,946	21
Internal Loads				
Lights	97,130	24,283	121,413	9
People	315,714	0	315,714	25
Misc	137,166	0	137,166	11
Sub Total ==>	550,010	24,283	574,293	45
Ceiling Load	29,829	-29,829	0	0
Ventilation Load	0	0	475,386	37
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	19,688		19,688	2
Exhaust Heat		-60,742	-60,742	-5
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	724,729	79,457	1,279,572	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	30,970	5
Glass/Door Cond	20,736	4
Wall Cond	69,439	12
Partition/Door	8,520	1
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	129,665	22
Internal Loads		
Lights	97,130	16
People	174,048	30
Misc	137,166	23
Sub Total ==>	408,344	69
Ceiling Load	32,168	5
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	19,585	3
Grand Total ==>	589,762	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 33

	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	-58,318	8.30
Glass Solar	0	0	0.00
Glass/Door Cond	-39,507	-39,507	5.62
Wall Cond	-84,351	-103,944	14.79
Partition/Door	-17,416	-17,416	2.48
Floor	-14,429	-14,429	2.05
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-155,703	-233,614	33.25
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	-31,000	0	0.00
Ventilation Load	0	-398,726	56.75
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		39,790	-5.66
OA Preheat Diff.		-95,351	13.57
RA Preheat Diff.		-14,756	2.10
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-186,703	-702,656	100.00

TEMPERATURES

	Cooling	Heating
SADB	53.0	85.9
Ra Plenum	77.6	64.2
Return	77.7	64.8
Ret/OA	84.8	36.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	28,906	10,969
Terminal	28,906	10,969
Main Fan	28,906	10,969
Sec Fan	0	0
Nom Vent	14,475	10,036
AHU Vent	14,475	10,036
Infil	0	0
MinStop/Rh	10,969	10,969
Return	24,022	7,469
Exhaust	9,591	6,536
Rm Exh	4,885	3,500
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	50.1	91.5
cfm/ft²	1.53	0.58
cfm/ton	271.09	
ft²/ton	177.61	
Btu/hr·ft²	67.56	-36.85
No. People	696	

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	106.6	1,279.6	968.1	28,578	84.8	66.3	70.7	53.0	51.1	55.0
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	106.6	1,279.6								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	18,939		
Part	2,444		
Int Door	0		
ExFlr	780		
Roof	16,727	0	0
Wall	10,026	929	9
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-386.9	10,969	53.0	85.9
Aux Htg	0.0	0	0.0	0.0
Preheat	-310.9	14,475	33.0	53.0
Reheat	-200.2	10,969	53.0	70.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-697.8			

System Checksums

By P2S Engineering, Inc

System - 001 — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	45,151	45,151	3
Glass Solar	76,998	0	76,998	5
Glass/Door Cond	17,522	0	17,522	1
Wall Cond	81,035	36,966	118,001	8
Partition/Door	4,647		4,647	0
Floor	63,635		63,635	5
Adjacent Floor	0	0	0	0
Infiltration	80,123		80,123	6
Sub Total ==>	323,958	82,117	406,075	29
Internal Loads				
Lights	175,322	43,831	219,153	16
People	260,124	0	260,124	18
Misc	198,114	0	198,114	14
Sub Total ==>	633,561	43,831	677,391	48
Ceiling Load	10,929	-10,929	0	0
Ventilation Load	0	0	251,224	18
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-14,037	-14,037	-1
Sup. Fan Heat			46,722	3
Ret. Fan Heat		46,296	46,296	3
Duct Heat Pkup		-86,904	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	968,447	60,374	1,413,672	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 15
OADB: 97

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	85,715	10
Glass/Door Cond	17,020	2
Wall Cond	74,950	9
Partition/Door	4,647	1
Floor	63,635	8
Adjacent Floor	0	0
Infiltration	61,831	7
Sub Total ==>	307,797	37
Internal Loads		
Lights	175,322	21
People	137,166	17
Misc	198,114	24
Sub Total ==>	510,603	62
Ceiling Load	8,406	1
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	826,806	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-39,235	5.09
Glass Solar	0	0	0.00
Glass/Door Cond	-34,814	-34,814	4.52
Wall Cond	-70,659	-101,393	13.16
Partition/Door	-7,262	-7,262	0.94
Floor	-99,452	-99,452	12.90
Adjacent Floor	0	0	0
Infiltration	-107,579	-107,579	13.96
Sub Total ==>	-319,766	-389,736	50.57
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	-39,360	0	0.00
Ventilation Load	0	-337,314	43.76
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		19,433	-2.52
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-63,123	8.19
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-359,126	-770,739	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	95.5
Ra Plenum	74.7	65.6
Return	75.8	65.6
Ret/OA	79.8	41.3
Fn MtrTD	0.1	0.0
Fn BldTD	0.2	0.0
Fn Frict	0.7	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	39,480	11,844
Terminal	39,480	11,844
Main Fan	39,480	11,844
Sec Fan	0	0
Nom Vent	7,651	7,651
AHU Vent	7,651	7,651
Infil	2,440	2,440
MinStop/Rh	11,844	11,844
Return	39,120	11,484
Exhaust	7,291	7,291
Rm Exh	2,800	2,800
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	19.4	64.6
cfm/ft²	0.77	0.23
cfm/ton	335.13	
ft²/ton	436.05	
Btu/hr·ft²	27.52	-15.00
No. People	546	

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	117.8	1,413.7	1,208.4	39,422	79.8	62.5	57.9	51.9	49.8	50.3
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	117.8	1,413.7								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	51,369		
Part	7,051		
Int Door	0		
ExFlr	26,100		
Roof	26,100	0	0
Wall	13,800	879	6
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-569.0	11,844	51.9	95.5
Aux Htg	0.0	0	0.0	0.0
Preheat	-201.8	7,651	28.0	51.9
Reheat	-209.9	11,844	51.9	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-770.7			

System Checksums

By P2S ENGINEERING, INC

Bldg 7 Science — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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
Skylite Cond	0	0	0	0
Roof Cond	0	172,229	172,229	6
Glass Solar	144,245	0	144,245	5
Glass/Door Cond	67,760	0	67,760	2
Wall Cond	137,971	47,237	185,208	6
Partition/Door	11,039		11,039	0
Floor	276		276	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	361,291	219,466	580,757	19
Internal Loads				
Lights	162,498	40,624	203,122	7
People	417,838	0	417,838	14
Misc	297,445	0	297,445	10
Sub Total ==>	877,780	40,624	918,405	30
Ceiling Load	92,457	-92,457	0	0
Ventilation Load	0	0	1,783,052	58
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	18,665		18,665	1
Exhaust Heat		-209,582	-209,582	-7
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	1,350,194	-41,949	3,091,297	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 18
OADB: 91

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	127,818	11
Glass/Door Cond	70,204	6
Wall Cond	158,307	14
Partition/Door	12,361	1
Floor	338	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	369,029	32
Internal Loads		
Lights	162,498	14
People	226,094	19
Misc	297,445	25
Sub Total ==>	686,037	59
Ceiling Load	99,789	9
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	14,249	1
Grand Total ==>	1,169,103	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 33

	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	-78,704	3.89
Glass Solar	0	0	0.00
Glass/Door Cond	-134,565	-134,565	6.65
Wall Cond	-163,936	-225,835	11.16
Partition/Door	-20,365	-20,365	1.01
Floor	-3,817	-3,817	0.19
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-322,683	-463,286	22.90
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	-71,172	0	0.00
Ventilation Load	0	-909,833	44.97
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		56,365	-2.79
OA Preheat Diff.		-685,093	33.86
RA Preheat Diff.		-21,213	1.05
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-393,855	-2,023,059	100.00

TEMPERATURES

	Cooling	Heating
SADB	54.2	84.7
Ra Plenum	79.8	64.0
Return	79.8	64.0
Ret/OA	90.2	35.5
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	61,063	24,916
Terminal	61,063	24,916
Main Fan	61,063	24,916
Sec Fan	0	0
Nom Vent	53,036	22,900
AHU Vent	53,036	22,900
Infil	0	0
MinStop/Rh	24,916	24,916
Return	18,067	10,716
Exhaust	10,039	8,699
Rm Exh	42,997	14,201
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	86.9	91.9
cfm/ft²	1.64	0.67
cfm/ton	237.04	
ft²/ton	144.51	
Btu/hr·ft²	83.04	-54.35
No. People	904	

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	257.6	3,091.3	2,236.2	60,507	90.2	69.1	77.0	54.2	52.6	58.8
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	257.6	3,091.3								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	37,226		
Part	1,551		
Int Door	0		
ExFlr	1,006		
Roof	22,709	0	0
Wall	16,624	3,188	19
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-817.4	24,916	54.2	84.7
Aux Htg	0.0	0	0.0	0.0
Preheat	-1,205.7	53,036	33.0	54.2
Reheat	-423.5	24,916	54.2	70.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-2,023.1			

Project Name: MT SAN ANTONIO COLLEGE BLDG 7 RENO
Dataset Name: 4101-BLDG7.TRC

System Checksums

By P2S Engineering, Inc

bldg 6 **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 16
Outside Air: OADB/WB/HR: 95 / 69 / 66

	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
Skylite Cond	0	0	0	0
Roof Cond	0	330,874	330,874	11
Glass Solar	122,611	0	122,611	4
Glass/Door Cond	26,299	0	26,299	1
Wall Cond	78,531	39,654	118,185	4
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	153,813		153,813	5
Sub Total ==>	381,254	370,528	751,782	25
Internal Loads				
Lights	350,168	87,542	437,710	15
People	550,559	0	550,559	18
Misc	406,445	0	406,445	14
Sub Total ==>	1,307,172	87,542	1,394,714	47
Ceiling Load	72,349	-72,349	0	0
Ventilation Load	0	0	581,825	19
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-24,248	-24,248	-1
Sup. Fan Heat			157,356	5
Ret. Fan Heat		130,967	130,967	4
Duct Heat Pkup		-218,420	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	1,760,775	274,021	2,992,396	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 16
OADB: 95

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	130,490	9
Glass/Door Cond	26,214	2
Wall Cond	78,860	5
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	140,715	9
Sub Total ==>	376,279	25
Internal Loads		
Lights	350,168	23
People	291,472	19
Misc	406,445	27
Sub Total ==>	1,048,085	70
Ceiling Load	77,164	5
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	1,501,528	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-167,645	10.37
Glass Solar	0	0	0.00
Glass/Door Cond	-51,125	-51,125	3.16
Wall Cond	-62,066	-91,421	5.66
Partition/Door	0	0	0.00
Floor	-18,863	-18,863	1.17
Adjacent Floor	0	0	0
Infiltration	-263,264	-263,264	16.29
Sub Total ==>	-395,319	-592,319	36.64
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	-135,267	0	0.00
Ventilation Load	0	-995,844	61.60
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		27,605	-1.71
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-56,009	3.46
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-530,586	-1,616,566	100.00

TEMPERATURES

	Cooling	Heating
SADB	60.4	84.1
Ra Plenum	76.2	63.8
Return	77.7	63.8
Ret/OA	81.7	36.8
Fn MtrTD	0.1	0.0
Fn BldTD	0.3	0.0
Fn Frict	1.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	99,898	29,969
Terminal	99,898	29,969
Main Fan	99,898	29,969
Sec Fan	0	0
Nom Vent	22,587	22,587
AHU Vent	22,587	22,587
Infil	5,971	5,971
MinStop/Rh	29,969	29,969
Return	83,282	13,353
Exhaust	5,971	5,971
Rm Exh	22,587	22,587
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	22.6	75.4
cfm/ft²	0.98	0.29
cfm/ton	400.61	
ft²/ton	408.17	
Btu/hr·ft²	29.40	-15.88
No. People	1,157	

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	249.4	2,992.4	2,673.8	99,081	81.7	64.4	64.0	56.9	54.4	59.9
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	249.4	2,992.4								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	101,784		
Part	0		
Int Door	0		
ExFlr	943		
Roof	101,784	0	0
Wall	31,719	2,076	7
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-896.5	29,969	56.9	84.1
Aux Htg	0.0	0	0.0	0.0
Preheat	-720.1	22,587	28.0	56.9
Reheat	-365.9	29,969	56.9	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-1,616.6			

System Checksums

By P2S Engineering, Inc

System - 001 **Double Duct**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 94 / 69 / 65

	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
Skylite Cond	0	0	0	0
Roof Cond	0	190,736	190,736	14
Glass Solar	70,747	0	70,747	5
Glass/Door Cond	16,127	0	16,127	1
Wall Cond	103,700	57,548	161,249	12
Partition/Door	3,779		3,779	0
Floor	60,955		60,955	4
Adjacent Floor	0	0	0	0
Infiltration	44,338		44,338	3
Sub Total ==>	299,646	248,285	547,931	40
Internal Loads				
Lights	133,191	33,298	166,489	12
People	237,510	0	237,510	18
Misc	189,257	0	189,257	14
Sub Total ==>	559,957	33,298	593,255	44
Ceiling Load	66,353	-66,353	0	0
Ventilation Load	0	0	160,699	12
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	934		934	0
Exhaust Heat		-10,387	-10,387	-1
Sup. Fan Heat			64,757	5
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	926,891	204,843	1,357,190	100.00

CLG SPACE PEAK

Mo/Hr: 8 / 18
OADB: 92

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	72,365	9
Glass/Door Cond	15,334	2
Wall Cond	108,559	13
Partition/Door	3,779	0
Floor	60,955	8
Adjacent Floor	0	0
Infiltration	37,596	5
Sub Total ==>	298,589	37
Internal Loads		
Lights	133,191	16
People	123,205	15
Misc	189,257	23
Sub Total ==>	445,653	55
Ceiling Load	67,404	8
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing		
Exhaust Heat		
OA Preheat Diff.		
RA Preheat Diff.		
Additional Reheat		
Underflr Sup Ht Pkup		
Supply Air Leakage		
Grand Total ==>	811,646	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-121,805	15.09
Glass Solar	0	0	0.00
Glass/Door Cond	-32,623	-32,623	4.04
Wall Cond	-112,912	-179,402	22.23
Partition/Door	-5,694	-5,694	0.71
Floor	-91,831	-91,831	11.38
Adjacent Floor	0	0	0
Infiltration	-82,720	-82,720	10.25
Sub Total ==>	-325,780	-514,075	63.71
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	-44,371	0	0.00
Ventilation Load	0	-299,807	37.15
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	-8	-8	0.00
Exhaust Heat		6,946	-0.86
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-370,158	-806,944	100.00

TEMPERATURES

	Cooling	Heating
SADB	57.2	75.7
Ra Plenum	79.0	64.6
Return	79.0	64.6
Ret/OA	81.4	59.0
Fn MtrTD	0.1	0.0
Fn BldTD	0.3	0.0
Fn Frict	0.9	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	43,801	43,801
Terminal	43,801	43,801
Main Fan	43,801	43,801
Sec Fan	0	0
Nom Vent	6,800	6,800
AHU Vent	6,800	6,800
Infil	1,876	1,876
MinStop/Rh	0	0
Return	38,877	38,877
Exhaust	1,876	1,876
Rm Exh	6,800	6,800
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	15.5	15.5
cfm/ft²	1.05	1.05
cfm/ton	387.28	
ft²/ton	368.64	
Btu/hr·ft²	32.55	-19.35
No. People	468	

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	113.1	1,357.2	1,230.8	43,711	81.4	64.2	63.7	55.8	53.9	59.4
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	113.1	1,357.2								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	41,693		
Part	3,063		
Int Door	0		
ExFlr	22,614		
Roof	22,614	0	0
Wall	15,054	1,314	9
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-806.9	43,801	59.0	75.7
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	-806.9			

System Checksums

By P2S Engineering, Inc

Recital Hall — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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
Skylite Cond	0	0	0	0
Roof Cond	0	134,426	134,426	16
Glass Solar	47,395	0	47,395	5
Glass/Door Cond	19,374	0	19,374	2
Wall Cond	19,446	4,797	24,244	3
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	86,216	139,224	225,439	26
Internal Loads				
Lights	112,464	28,116	140,579	16
People	225,000	0	225,000	26
Misc	78,100	0	78,100	9
Sub Total ==>	415,563	28,116	443,679	51
Ceiling Load	36,716	-36,716	0	0
Ventilation Load	0	0	234,769	27
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-40,782	-40,782	-5
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	538,495	89,842	863,106	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 16
OADB: 93

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	57,196	13
Glass/Door Cond	19,536	4
Wall Cond	17,853	4
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	94,585	21
Internal Loads		
Lights	112,464	26
People	125,000	28
Misc	78,100	18
Sub Total ==>	315,563	72
Ceiling Load	30,479	7
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	440,627	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-95,851	19.66
Glass Solar	0	0	0.00
Glass/Door Cond	-49,134	-49,134	10.08
Wall Cond	-24,155	-30,033	6.16
Partition/Door	0	0	0.00
Floor	-31,181	-31,181	6.39
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-104,469	-206,198	42.28
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	-49,086	0	0.00
Ventilation Load	0	-326,601	66.97
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		52,644	-10.80
OA Preheat Diff.		-7,490	1.54
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-153,555	-487,646	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	89.8
Ra Plenum	77.1	63.2
Return	77.1	63.2
Ret/OA	81.6	28.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	24,137	7,242
Terminal	24,137	7,242
Main Fan	24,137	7,242
Sec Fan	0	0
Nom Vent	7,500	7,242
AHU Vent	7,500	7,242
Infil	0	0
MinStop/Rh	7,242	7,242
Return	24,137	7,242
Exhaust	7,500	7,242
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	31.1	100.0
cfm/ft²	1.05	0.32
cfm/ton	335.59	
ft²/ton	318.15	
Btu/hr·ft²	37.72	-21.31
No. People	500	

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	71.9	863.1	686.7	24,021	81.6	64.9	68.9	55.0	52.7	58.1
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	71.9	863.1								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	22,883		
Part	0		
Int Door	0		
ExFlr	928		
Roof	22,883	0	0
Wall	17,632	1,141	6
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-270.2	7,242	55.0	89.8
Aux Htg	0.0	0	0.0	0.0
Preheat	-217.5	7,500	28.0	55.0
Reheat	-116.6	7,242	55.0	70.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-487.7			

System Checksums

By P2S Engineering, Inc

Studio — **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 8 / 17
Outside Air: OADB/WB/HR: 92 / 70 / 79

	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
Skylite Cond	0	0	0	0
Roof Cond	0	236,829	236,829	15
Glass Solar	32,144	0	32,144	2
Glass/Door Cond	13,839	0	13,839	1
Wall Cond	27,027	6,394	33,421	2
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	0		0	0
Sub Total ==>	73,010	243,223	316,233	21
Internal Loads				
Lights	198,938	49,735	248,673	16
People	450,000	0	450,000	29
Misc	138,151	0	138,151	9
Sub Total ==>	787,089	49,735	836,824	55
Ceiling Load	67,542	-67,542	0	0
Ventilation Load	0	0	460,314	30
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-84,823	-84,823	-6
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	927,641	140,593	1,528,549	100.00

CLG SPACE PEAK

Mo/Hr: 7 / 17
OADB: 94

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	29,909	4
Glass/Door Cond	15,606	2
Wall Cond	27,075	4
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	0	0
Sub Total ==>	72,591	10
Internal Loads		
Lights	198,938	27
People	250,000	34
Misc	138,151	19
Sub Total ==>	587,089	80
Ceiling Load	71,670	10
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
***Grand Total* ==>**	731,350	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-169,131	20.45
Glass Solar	0	0	0.00
Glass/Door Cond	-35,063	-35,063	4.24
Wall Cond	-32,719	-40,351	4.88
Partition/Door	0	0	0.00
Floor	-42,806	-42,806	5.17
Adjacent Floor	0	0	0
Infiltration	0	0	0.00
Sub Total ==>	-110,588	-287,352	34.74
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	-88,104	0	0.00
Ventilation Load	0	-542,080	65.53
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		88,660	-10.72
OA Preheat Diff.		-86,416	10.45
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-198,692	-827,187	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	85.4
Ra Plenum	77.3	63.1
Return	77.3	63.1
Ret/OA	82.7	28.0
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	40,063	12,019
Terminal	40,063	12,019
Main Fan	40,063	12,019
Sec Fan	0	0
Nom Vent	15,000	12,019
AHU Vent	15,000	12,019
Infil	0	0
MinStop/Rh	12,019	12,019
Return	40,063	12,019
Exhaust	15,000	12,019
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	37.4	100.0
cfm/ft²	0.99	0.30
cfm/ton	314.52	
ft²/ton	317.78	
Btu/hr·ft²	37.76	-20.44
No. People	1,000	

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	127.4	1,528.6	1,184.9	39,860	82.7	65.5	70.4	55.0	52.7	57.7
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	127.4	1,528.6								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	40,478		
Part	0		
Int Door	0		
ExFlr	1,274		
Roof	40,478	0	0
Wall	22,950	814	4
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-392.3	12,019	55.0	85.4
Aux Htg	0.0	0	0.0	0.0
Preheat	-434.9	15,000	28.0	55.0
Reheat	-193.6	12,019	55.0	70.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-827.2			

System Checksums

By P2S Engineering, Inc

System - 001 **Fan Coil**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 15
Outside Air: OADB/WB/HR: 97 / 69 / 63

	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
Skylite Cond	0	0	0	0
Roof Cond	0	90,027	90,027	10
Glass Solar	43,584	0	43,584	5
Glass/Door Cond	24,102	0	24,102	3
Wall Cond	87,571	49,216	136,787	16
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	30,523		30,523	3
Sub Total ==>	185,781	139,243	325,024	37
Internal Loads				
Lights	59,478	14,869	74,347	8
People	90,182	0	90,182	10
Misc	56,174	0	56,174	6
Sub Total ==>	205,834	14,869	220,703	25
Ceiling Load	38,497	-38,497	0	0
Ventilation Load	0	0	325,361	37
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-20,277	-20,277	-2
Sup. Fan Heat			29,990	3
Ret. Fan Heat		0	0	0
Duct Heat Pkup		-41,629	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	430,112	53,710	880,802	100.00

CLG SPACE PEAK

Mo/Hr: Sum of
OADB: Peaks

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	60,972	15
Glass/Door Cond	21,207	5
Wall Cond	86,523	22
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	22,186	6
Sub Total ==>	190,887	48
Internal Loads		
Lights	59,478	15
People	47,870	12
Misc	56,174	14
Sub Total ==>	163,522	41
Ceiling Load	41,042	10
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Grand Total ==>	395,451	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-47,229	6.49
Glass Solar	0	0	0.00
Glass/Door Cond	-45,746	-45,746	6.29
Wall Cond	-70,812	-111,754	15.36
Partition/Door	0	0	0.00
Floor	-38,894	-38,894	5.35
Adjacent Floor	0	0	0
Infiltration	-42,685	-42,685	5.87
Sub Total ==>	-198,137	-286,308	39.35
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	-26,141	0	0.00
Ventilation Load	0	-455,001	62.54
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		13,768	-1.89
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-224,278	-727,541	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.0	78.8
Ra Plenum	81.5	62.9
Return	81.5	62.9
Ret/OA	90.0	43.8
Fn MtrTD	0.1	0.0
Fn BldTD	0.3	0.0
Fn Frict	1.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	18,884	18,884
Terminal	18,884	18,884
Main Fan	18,884	18,884
Sec Fan	0	0
Nom Vent	10,320	10,320
AHU Vent	10,320	10,320
Infil	968	968
MinStop/Rh	0	0
Return	11,007	11,007
Exhaust	2,443	2,443
Rm Exh	8,845	8,845
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	54.7	54.7
cfm/ft²	1.17	1.17
cfm/ton	257.27	
ft²/ton	219.84	
Btu/hr·ft²	54.59	-45.09
No. People	179	

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	73.4	880.8	768.7	18,884	91.4	66.5	58.5	53.0	50.8	52.2
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	73.4	880.8								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	16,136		
Part	0		
Int Door	0		
ExFlr	1,332		
Roof	16,922	0	0
Wall	23,800	1,155	5
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-727.5	18,884	43.8	78.8
Aux Htg	0.0	0	0.0	0.0
Preheat	-161.1	18,884	43.8	51.6
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-727.5			

System Checksums

By P2S Engineering, Inc

System - 001 **Variable Volume Reheat (30% Min Flow Default)**

COOLING COIL PEAK

Peaked at Time: Mo/Hr: 9 / 16
Outside Air: OADB/WB/HR: 96 / 70 / 67

	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
Skylite Cond	0	0	0	0
Roof Cond	0	36,408	36,408	5
Glass Solar	32,396	0	32,396	4
Glass/Door Cond	24,889	0	24,889	3
Wall Cond	97,470	54,053	151,523	21
Partition/Door	0		0	0
Floor	40,716		40,716	6
Adjacent Floor	0	0	0	0
Infiltration	26,248		26,248	4
Sub Total ==>	221,719	90,461	312,180	43
Internal Loads				
Lights	50,157	12,539	62,697	9
People	188,710	0	188,710	26
Misc	51,297	0	51,297	7
Sub Total ==>	290,165	12,539	302,704	42
Ceiling Load	24,249	-24,249	0	0
Ventilation Load	0	0	109,558	15
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		0	0	0
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
***Grand Total* ==>**	536,133	78,751	724,442	100.00

CLG SPACE PEAK

Mo/Hr: 9 / 16
OADB: 96

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	32,396	8
Glass/Door Cond	24,889	6
Wall Cond	97,470	23
Partition/Door	0	0
Floor	40,716	9
Adjacent Floor	0	0
Infiltration	23,698	5
Sub Total ==>	219,169	51
Internal Loads		
Lights	50,157	12
People	86,506	20
Misc	51,297	12
Sub Total ==>	187,961	44
Ceiling Load	24,249	6
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Exhaust Heat		
OA Preheat Diff.		
RA Preheat Diff.		
Additional Reheat		
Underflr Sup Ht Pkup		
Supply Air Leakage		
***Grand Total* ==>**	431,378	100.00

HEATING COIL PEAK

Mo/Hr: Heating Design
OADB: 28

	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	-24,569	4.94
Glass Solar	0	0	0.00
Glass/Door Cond	-49,434	-49,434	9.94
Wall Cond	-88,452	-130,752	26.28
Partition/Door	0	0	0.00
Floor	-63,634	-63,634	12.79
Adjacent Floor	0	0	0
Infiltration	-42,337	-42,337	8.51
Sub Total ==>	-243,857	-310,726	62.46
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	-48,112	0	0.00
Ventilation Load	0	-176,710	35.52
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		0	0.00
OA Preheat Diff.		0	0.00
RA Preheat Diff.		-10,061	2.02
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
***Grand Total* ==>**	-291,969	-497,496	100.00

TEMPERATURES

	Cooling	Heating
SADB	54.0	113.1
Ra Plenum	78.6	58.9
Return	78.6	58.9
Ret/OA	82.2	37.8
Fn MtrTD	0.0	0.0
Fn BldTD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	19,599	5,880
Terminal	19,599	5,880
Main Fan	19,599	5,880
Sec Fan	0	0
Nom Vent	4,008	4,008
AHU Vent	4,008	4,008
Infil	960	960
MinStop/Rh	5,880	5,880
Return	15,591	1,872
Exhaust	0	0
Rm Exh	4,968	4,968
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	20.5	68.2
cfm/ft²	1.17	0.35
cfm/ton	324.64	
ft²/ton	276.63	
Btu/hr·ft²	43.38	-29.79
No. People	334	

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	60.4	724.4	609.0	19,599	82.2	64.7	64.3	54.0	52.2	55.8
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	60.4	724.4								

AREAS

	Gross Total	Glass ft²	Glass (%)
Floor	16,700		
Part	0		
Int Door	0		
ExFlr	16,700		
Roof	16,700	0	0
Wall	13,056	2,007	15
Ext Door	0	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-382.5	5,880	54.0	113.1
Aux Htg	0.0	0	0.0	0.0
Preheat	-115.0	4,008	28.0	54.0
Reheat	-90.5	5,880	54.0	68.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-497.5			

BUILDING COOL HEAT DEMAND

Diversified to match trends

By P2S ENGINEERING, INC

January	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	52.0	47.1	0	0.0	-50,942	0.0	-57,099	0.0	-150,780	0.0	-172,665	0.0
2	52.0	46.1	0	0.0	-58,174	0.0	-58,591	0.0	-159,973	0.0	-279,411	0.0
3	51.0	45.5	0	0.0	-60,813	0.0	-61,048	0.0	-167,970	0.0	-368,059	0.0
4	51.0	44.9	0	0.0	-62,087	0.0	-62,105	0.0	-177,679	0.0	-555,773	0.0
5	50.0	43.9	0	0.0	-64,528	0.0	-64,820	0.0	-260,622	0.0	-592,192	0.0
6	49.0	43.5	0	0.0	-68,260	0.0	-68,260	0.0	-460,923	0.0	-725,027	0.0
7	49.0	43.5	-4,551,945	119.1	-3,716,369	58.3	-69,260	0.0	-524,793	0.0	-5,174,180	39.0
8	49.0	43.5	-3,739,645	158.8	-3,075,568	66.8	-112,858	0.0	-570,453	0.0	-5,609,531	43.8
9	52.0	44.9	-6,620,819	191.3	-5,578,631	27.8	-85,692	0.0	-342,994	0.0	-9,094,361	32.9
10	56.0	46.8	-3,234,412	268.9	-3,138,227	80.4	-12,787	0.0	-76,552	0.0	-6,121,551	86.9
11	58.0	48.3	-1,557,266	412.6	-1,746,708	156.2	-4,167	0.0	-45,544	0.0	-5,404,493	153.8
12	60.0	49.9	-804,857	535.8	-1,363,338	231.2	0	0.0	-31,126	0.0	-4,064,611	233.8
13	62.0	51.6	-891,277	555.9	-1,863,010	234.0	0	0.0	-12,591	0.0	-3,501,278	242.6
14	64.0	53.1	-634,329	653.0	-1,051,145	333.6	0	0.0	-8,679	0.0	-1,855,952	326.2
15	65.0	53.7	-562,027	701.9	-866,716	380.8	0	0.0	-5,015	0.0	-1,114,785	371.3
16	64.0	53.1	-548,145	691.2	-817,335	353.6	0	0.0	-2,188	0.0	-1,000,481	342.4
17	63.0	52.8	-620,282	650.6	-982,225	366.2	0	0.0	0	0.0	-1,164,450	355.0
18	62.0	52.3	-797,064	558.3	-1,664,534	357.9	-3,809	0.0	-3,809	0.0	-1,742,859	353.1
19	61.0	51.9	-817,306	511.6	-1,559,650	375.8	-7,887	0.0	-7,887	0.0	-1,636,895	364.6
20	60.0	51.5	-1,131,787	499.1	-1,705,181	370.6	-10,971	0.0	-13,826	0.0	-1,773,210	365.4
21	58.0	50.5	-1,514,024	505.3	-1,779,719	376.6	-15,255	0.0	-20,603	0.0	-1,824,328	371.0
22	54.0	48.7	-9,558	0.0	-15,572	0.0	-24,298	0.0	-33,118	0.0	-15,572	0.0
23	54.0	48.3	-16,436	0.0	-32,037	0.0	-30,567	0.0	-41,740	0.0	-32,037	0.0
24	53.0	47.9	-25,918	0.0	-45,907	0.0	-61,038	0.0	-75,158	0.0	-45,907	0.0

February	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	53.0	47.8	-34,621	0.0	-41,131	0.0	-50,927	0.0	-33,612	0.0	-33,612	0.0
2	53.0	43.3	-37,558	0.0	-54,252	0.0	-55,020	0.0	-71,753	0.0	-88,654	0.0
3	53.0	43.0	-40,048	0.0	-55,017	0.0	-55,428	0.0	-144,341	0.0	-144,341	0.0
4	52.0	42.4	-41,927	0.0	-57,700	0.0	-57,858	0.0	-150,899	0.0	-150,899	0.0
5	51.0	41.7	-42,972	0.0	-61,259	0.0	-61,364	0.0	-166,714	0.0	-166,714	0.0
6	51.0	41.2	-42,509	0.0	-62,536	0.0	-62,700	0.0	-173,178	0.0	-292,740	0.0
7	51.0	41.2	-3,561,349	132.9	-3,334,128	59.9	-62,682	0.0	-175,856	0.0	-4,687,844	45.5
8	51.0	41.2	-2,846,041	177.1	-2,313,537	72.0	-43,015	0.0	-145,383	0.0	-5,253,593	56.2
9	53.0	42.2	-3,662,418	282.8	-4,359,135	37.2	-20,953	0.0	-20,953	0.0	-7,990,228	47.6
10	58.0	49.4	-1,934,161	364.3	-2,340,735	129.9	-7,111	0.0	-7,111	0.0	-5,577,259	143.8
11	60.0	50.6	-858,091	555.3	-1,254,651	216.1	0	0.0	0	0.0	-4,941,617	217.2
12	62.0	52.0	-645,746	650.4	-1,088,175	289.7	0	0.0	0	0.0	-2,967,627	287.5
13	64.0	53.2	-818,002	661.9	-1,506,037	290.9	0	0.0	0	0.0	-2,626,807	296.4
14	67.0	54.9	-613,542	779.7	-833,779	423.7	0	0.0	0	0.0	-1,108,988	408.6
15	67.0	55.1	-536,746	834.6	-719,549	445.5	0	0.0	0	0.0	-841,263	426.4
16	65.0	54.5	-521,420	840.0	-735,672	391.0	0	0.0	0	0.0	-864,857	374.2
17	64.0	54.5	-587,430	783.1	-834,946	400.1	0	0.0	0	0.0	-936,857	382.6
18	63.0	54.2	-747,635	653.6	-1,425,553	384.9	0	0.0	0	0.0	-1,538,631	374.5
19	62.0	54.1	-784,695	598.1	-1,480,284	399.2	0	0.0	0	0.0	-1,484,098	382.3
20	61.0	53.7	-836,048	562.9	-1,624,826	389.2	-4,496	0.0	-4,496	0.0	-1,638,310	380.8
21	60.0	53.2	-1,247,117	559.6	-1,638,615	391.8	-8,757	0.0	-8,757	0.0	-1,694,899	384.9
22	58.0	52.5	-7,336	0.0	-11,340	0.0	-13,257	0.0	-13,257	0.0	-11,340	0.0
23	56.0	51.3	-9,909	0.0	-22,786	0.0	-17,158	0.0	-17,158	0.0	-22,786	0.0
24	55.0	50.4	-19,961	0.0	-34,822	0.0	-25,077	0.0	-25,077	0.0	-34,822	0.0

March	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	54.0	50.5	-32,257	0.0	-38,528	0.0	-47,191	0.0	-19,229	0.0	-19,229	0.0
2	53.0	49.9	-37,090	0.0	-52,615	0.0	-53,969	0.0	-28,119	0.0	-28,119	0.0
3	53.0	49.2	-39,723	0.0	-55,036	0.0	-55,409	0.0	-35,812	0.0	-35,812	0.0
4	52.0	48.8	-41,922	0.0	-57,640	0.0	-57,901	0.0	-93,032	0.0	-122,527	0.0
5	51.0	47.8	-42,966	0.0	-61,291	0.0	-61,349	0.0	-154,383	0.0	-154,330	0.0
6	51.0	47.0	-42,200	0.0	-62,491	0.0	-62,688	0.0	-168,491	0.0	-168,487	0.0
7	51.0	46.2	-3,360,767	138.8	-2,986,104	60.6	-53,516	0.0	-140,415	0.0	-4,218,396	54.3
8	52.0	46.6	-2,260,465	186.5	-1,973,151	76.1	-33,583	0.0	-62,425	0.0	-4,226,307	71.1
9	53.0	47.0	-2,902,912	311.1	-3,849,129	38.9	-14,930	0.0	-14,882	0.0	-7,314,868	46.6
10	59.0	49.7	-1,539,073	388.5	-1,707,128	158.1	0	0.0	0	0.0	-4,943,933	163.7
11	61.0	51.2	-662,709	589.3	-1,041,085	268.0	0	0.0	0	0.0	-3,562,012	264.1
12	63.0	52.7	-600,661	704.3	-944,959	336.5	0	0.0	0	0.0	-2,233,314	330.3
13	65.0	53.8	-776,406	706.8	-1,192,948	335.9	0	0.0	0	0.0	-1,507,694	338.9
14	68.0	55.5	-592,171	838.6	-718,584	472.7	0	0.0	0	0.0	-770,265	456.5
15	66.0	55.0	-516,843	906.0	-702,695	429.6	0	0.0	0	0.0	-783,508	413.3
16	66.0	55.5	-502,612	917.4	-672,044	430.3	0	0.0	0	0.0	-746,074	412.3
17	65.0	55.2	-565,048	852.8	-742,537	437.1	0	0.0	0	0.0	-806,632	420.6
18	64.0	55.0	-719,882	706.3	-1,112,461	415.5	0	0.0	0	0.0	-1,219,315	407.3
19	63.0	54.9	-768,084	635.0	-1,381,145	423.5	0	0.0	0	0.0	-1,378,395	407.7
20	62.0	54.4	-817,055	591.0	-1,529,017	408.1	0	0.0	0	0.0	-1,533,996	400.8
21	61.0	54.2	-1,101,331	585.4	-1,586,631	414.2	0	0.0	0	0.0	-1,591,754	403.9
22	59.0	54.0	-6,406	0.0	-10,113	0.0	-4,433	0.0	-4,433	0.0	-10,113	0.0
23	57.0	52.8	-8,272	0.0	-19,651	0.0	-11,046	0.0	-11,046	0.0	-19,651	0.0
24	55.0	51.8	-18,991	0.0	-33,240	0.0	-14,494	0.0	-14,494	0.0	-33,240	0.0

April	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	58.0	54.0	-20,462	0.0	-21,968	0.0	-29,825	0.0	-5,352	0.0	-5,352	0.0
2	57.0	53.2	-26,409	0.0	-31,624	0.0	-38,822	0.0	-7,647	0.0	-7,647	0.0
3	56.0	52.0	-29,278	0.0	-42,074	0.0	-43,959	0.0	-12,740	0.0	-12,740	0.0
4	55.0	51.3	-31,286	0.0	-47,339	0.0	-47,527	0.0	-18,084	0.0	-18,084	0.0
5	54.0	50.3	-32,270	0.0	-50,855	0.0	-51,163	0.0	-24,407	0.0	-24,337	0.0
6	54.0	50.2	-31,027	0.0	-51,455	0.0	-51,784	0.0	-29,463	0.0	-29,461	0.0
7	55.0	50.2	-2,502,893	148.0	-1,894,210	106.3	-30,666	0.0	-18,890	0.0	-2,037,466	119.8
8	58.0	52.0	-1,144,390	204.8	-1,091,733	145.0	-9,859	0.0	-8,784	0.0	-2,552,496	156.0
9	60.0	53.0	-1,656,532	436.7	-1,308,610	220.4	0	0.0	0	0.0	-3,755,069	198.7
10	64.0	54.6	-593,036	568.1	-771,938	317.6	0	0.0	0	0.0	-1,716,939	343.4
11	68.0	56.6	-540,186	728.4	-613,658	505.0	0	0.0	0	0.0	-666,048	494.5
12	70.0	57.5	-544,503	852.6	-613,741	584.8	0	0.0	0	0.0	-634,308	575.3
13	71.0	58.6	-704,656	877.0	-799,187	552.7	0	0.0	0	0.0	-818,535	550.5
14	71.0	59.0	-572,842	1,024.9	-636,712	620.4	0	0.0	0	0.0	-635,382	601.6
15	70.0	59.0	-503,668	1,150.5	-575,515	618.2	0	0.0	0	0.0	-574,936	604.9
16	69.0	68.6	-334,543	1,946.6	-563,491	595.1	0	0.0	0	0.0	-556,631	581.3
17	68.0	68.1	-526,652	1,650.3	-638,960	604.8	0	0.0	0	0.0	-632,334	572.8
18	66.0	57.6	-668,352	902.7	-834,906	537.1	0	0.0	0	0.0	-831,922	514.2
19	65.0	57.3	-727,985	727.7	-813,856	494.5	0	0.0	0	0.0	-806,268	492.6
20	64.0	57.0	-772,840	669.9	-1,245,033	465.3	0	0.0	0	0.0	-1,245,058	466.2
21	62.0	56.2	-812,830	661.0	-1,340,723	464.7	0	0.0	0	0.0	-1,359,052	465.7
22	61.0	56.0	-4,169	0.0	-8,232	0.0	0	0.0	0	0.0	-8,232	0.0
23	60.0	55.4	-2,963	0.0	-12,211	0.0	0	0.0	0	0.0	-12,211	0.0
24	59.0	55.0	-6,098	0.0	-21,633	0.0	-3,721	0.0	-3,721	0.0	-21,633	0.0

May	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	

Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	69.8	56.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	66.8	54.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	65.8	53.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	63.8	52.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	63.8	52.2	0	0.0	0	0.0	-3,616	0.0	0	0.0	0	0.0
6	63.8	52.2	0	0.0	0	0.0	-4,331	0.0	0	0.0	0	0.0
7	64.8	52.7	-334,003	200.4	-327,273	155.7	0	0.0	0	0.0	-126,642	337.6
8	65.8	53.3	-379,061	304.1	-408,013	245.6	0	0.0	0	0.0	-251,910	428.4
9	70.8	55.3	-508,157	888.2	-552,764	627.5	0	0.0	0	0.0	-404,970	703.7
10	74.8	57.0	-519,208	1,071.3	-537,860	831.6	0	0.0	0	0.0	-460,863	845.7
11	76.8	57.8	-501,143	1,174.9	-521,823	915.1	0	0.0	0	0.0	-467,790	919.7
12	77.8	58.3	-507,062	1,312.3	-528,980	965.5	0	0.0	0	0.0	-491,638	957.2
13	78.8	58.8	-603,671	1,351.9	-660,071	957.2	0	0.0	0	0.0	-611,050	960.5
14	78.8	58.9	-508,443	1,442.7	-560,707	1,002.7	0	0.0	0	0.0	-524,024	1,012.2
15	77.8	58.6	-459,968	1,505.3	-505,516	992.7	0	0.0	0	0.0	-490,987	1,010.0
16	76.8	58.3	-441,539	1,511.7	-490,716	960.3	0	0.0	0	0.0	-486,013	975.6
17	75.8	58.2	-475,531	1,358.1	-541,052	868.4	0	0.0	0	0.0	-532,938	883.8
18	75.8	58.6	-603,031	1,151.7	-673,036	750.6	0	0.0	0	0.0	-664,683	784.7
19	74.8	58.5	-665,038	855.3	-714,705	580.9	0	0.0	0	0.0	-708,834	613.0
20	74.8	58.9	-713,307	760.9	-759,879	555.3	0	0.0	0	0.0	-755,272	582.2
21	72.8	58.6	-752,314	752.8	-796,059	552.9	0	0.0	0	0.0	-789,304	572.9
22	72.8	58.7	-3,739	0.0	-3,824	0.0	0	0.0	0	0.0	-3,824	0.0
23	70.8	57.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	70.8	57.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

June	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	70.8	58.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	69.8	57.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	68.8	56.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	67.8	56.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	66.8	55.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	66.8	55.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	67.8	55.5	-229,440	297.2	-255,751	248.1	0	0.0	0	0.0	-82,172	454.5
8	70.8	56.8	-296,419	516.7	-367,263	352.9	0	0.0	0	0.0	-248,841	568.6
9	72.8	57.6	-433,408	1,344.5	-492,863	930.8	0	0.0	0	0.0	-400,125	1,055.7
10	76.8	59.1	-484,405	1,360.4	-509,375	1,014.8	0	0.0	0	0.0	-447,459	1,165.7
11	80.8	60.6	-484,392	1,495.1	-510,113	1,134.5	0	0.0	0	0.0	-448,403	1,261.2
12	82.8	61.5	-497,347	1,674.7	-516,423	1,214.9	0	0.0	0	0.0	-473,056	1,273.5
13	83.8	61.9	-588,567	1,714.6	-617,918	1,202.2	0	0.0	0	0.0	-573,472	1,227.7
14	83.8	62.0	-488,594	1,851.1	-534,572	1,255.2	0	0.0	0	0.0	-488,789	1,251.0
15	82.8	61.8	-437,043	1,957.7	-478,746	1,267.3	0	0.0	0	0.0	-444,694	1,262.8
16	80.8	61.2	-424,502	1,984.9	-465,868	1,206.5	0	0.0	0	0.0	-449,704	1,203.1
17	79.8	61.0	-445,563	1,779.8	-513,742	1,104.6	0	0.0	0	0.0	-483,889	1,097.9
18	78.8	60.8	-564,583	1,473.7	-648,347	952.3	0	0.0	0	0.0	-623,987	1,018.1
19	76.8	60.2	-626,023	1,109.5	-690,369	714.4	0	0.0	0	0.0	-673,011	741.4
20	75.8	60.1	-678,446	922.9	-737,967	656.1	0	0.0	0	0.0	-730,487	676.5
21	74.8	60.0	-721,703	884.4	-771,767	642.4	0	0.0	0	0.0	-770,193	660.8
22	73.8	59.8	-3,609	0.0	-3,774	0.0	0	0.0	0	0.0	-3,774	0.0
23	72.8	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	71.8	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

July	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	72.9	59.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	71.9	59.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	71.9	59.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	70.9	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	70.9	58.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	71.9	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	72.9	58.9	-206,858	425.4	-220,023	298.1	0	0.0	0	0.0	-45,130	603.2
8	74.9	59.5	-268,010	700.8	-315,099	483.2	0	0.0	0	0.0	-236,929	675.1
9	78.9	61.1	-411,447	1,720.8	-446,130	1,308.6	0	0.0	0	0.0	-391,987	1,348.9
10	82.9	62.6	-461,760	1,797.4	-476,995	1,415.9	0	0.0	0	0.0	-437,854	1,462.0
11	86.9	63.9	-460,561	1,922.8	-479,586	1,536.6	0	0.0	0	0.0	-435,377	1,583.9
12	88.9	64.7	-476,000	2,034.9	-493,873	1,600.7	0	0.0	0	0.0	-440,385	1,643.5
13	89.9	65.1	-567,486	2,098.9	-589,956	1,613.3	0	0.0	0	0.0	-549,046	1,660.5
14	88.9	64.9	-453,785	2,214.6	-499,653	1,602.8	0	0.0	0	0.0	-468,551	1,644.5
15	86.9	64.4	-365,203	2,270.5	-447,316	1,557.5	0	0.0	0	0.0	-416,742	1,598.1
16	84.9	63.8	-354,838	2,299.5	-440,713	1,498.7	0	0.0	0	0.0	-420,674	1,540.5
17	83.9	63.6	-427,196	2,133.2	-479,736	1,348.3	0	0.0	0	0.0	-451,949	1,411.2
18	82.9	63.3	-513,616	1,753.1	-612,277	1,174.0	0	0.0	0	0.0	-553,117	1,211.2
19	80.9	62.7	-600,055	1,233.1	-667,481	821.4	0	0.0	0	0.0	-642,200	904.4
20	76.9	61.4	-647,233	1,147.7	-716,917	746.3	0	0.0	0	0.0	-692,708	822.1
21	74.9	60.9	-684,377	1,071.9	-756,521	709.7	0	0.0	0	0.0	-741,952	783.6
22	74.9	61.0	-3,451	0.0	-3,751	0.0	0	0.0	0	0.0	-3,751	0.0
23	73.9	60.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	72.9	59.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

August	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	73.9	60.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	72.9	60.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	72.9	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	71.9	59.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5	71.9	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	71.9	59.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	74.9	60.5	-205,970	457.7	-220,784	362.6	0	0.0	0	0.0	-50,467	726.6
8	76.9	61.2	-269,932	742.4	-324,486	516.9	0	0.0	0	0.0	-240,242	714.7
9	80.9	62.7	-413,554	1,782.3	-453,866	1,414.2	0	0.0	0	0.0	-393,487	1,458.2
10	84.9	64.0	-455,916	1,835.8	-475,020	1,516.2	0	0.0	0	0.0	-435,021	1,562.4
11	86.9	64.8	-454,349	1,970.6	-474,457	1,587.5	0	0.0	0	0.0	-429,648	1,639.1
12	88.9	65.5	-471,600	2,131.6	-491,511	1,651.9	0	0.0	0	0.0	-432,148	1,697.2
13	89.9	65.9	-563,492	2,182.8	-586,318	1,669.8	0	0.0	0	0.0	-538,542	1,710.1
14	89.9	66.1	-442,478	2,272.4	-499,961	1,694.1	0	0.0	0	0.0	-462,063	1,723.7
15	88.9	65.9	-355,578	2,300.4	-445,619	1,691.5	0	0.0	0	0.0	-413,027	1,706.9
16	86.9	65.4	-346,251	2,301.8	-436,072	1,645.2	0	0.0	0	0.0	-411,772	1,648.2
17	85.9	65.1	-428,937	2,142.6	-477,596	1,483.9	0	0.0	0	0.0	-442,005	1,512.4
18	84.9	64.8	-525,871	1,756.0	-613,821	1,264.2	0	0.0	0	0.0	-560,049	1,296.4
19	82.9	64.1	-608,417	1,276.6	-670,153	862.6	0	0.0	0	0.0	-648,845	947.7
20	78.9	62.9	-651,750	1,151.1	-715,578	782.4	0	0.0	0	0.0	-691,514	848.9
21	76.9	62.2	-693,678	1,112.0	-751,246	751.6	0	0.0	0	0.0	-739,325	846.0
22	75.9	61.9	-3,435	0.0	-3,704	0.0	0	0.0	0	0.0	-3,704	0.0
23	74.9	61.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	73.9	60.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

September	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	72.9	59.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	71.9	58.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	71.9	58.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4	70.9	57.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

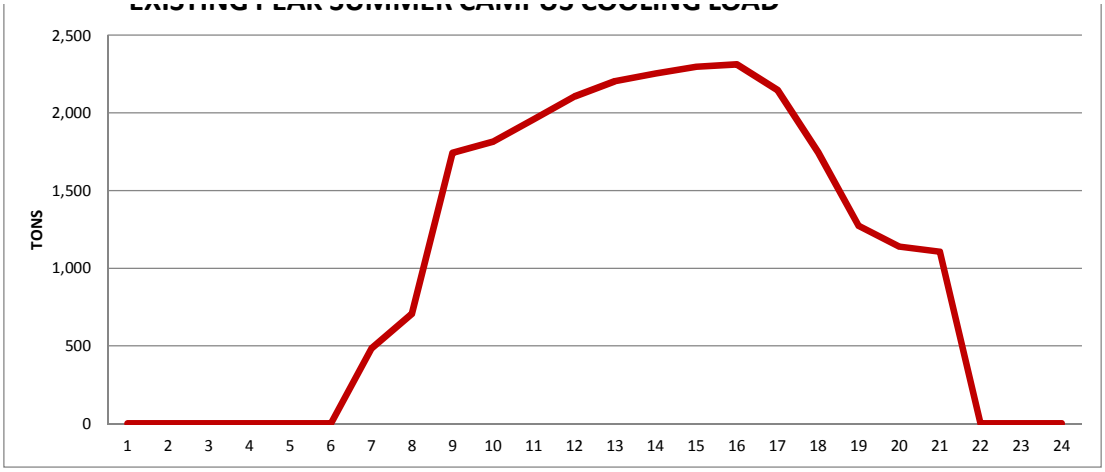
5	70.9	57.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6	70.9	57.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
7	72.9	58.3	-210,056	484.0	-230,661	337.7	0	0.0	0	0.0	-77,625	659.0
8	76.9	60.0	-283,163	706.5	-361,479	495.1	0	0.0	0	0.0	-248,696	681.1
9	80.9	61.7	-422,134	1,743.2	-488,211	1,336.3	0	0.0	0	0.0	-394,750	1,399.6
10	84.9	63.2	-454,452	1,815.4	-485,390	1,479.1	0	0.0	0	0.0	-433,532	1,515.9
11	88.9	64.8	-454,691	1,959.0	-480,922	1,611.2	0	0.0	0	0.0	-423,748	1,655.8
12	89.9	65.3	-465,252	2,106.4	-488,581	1,652.9	0	0.0	0	0.0	-430,033	1,697.0
13	90.9	65.8	-554,339	2,203.6	-585,846	1,679.6	0	0.0	0	0.0	-529,843	1,715.5
14	90.9	66.0	-405,924	2,253.3	-499,602	1,700.6	0	0.0	0	0.0	-451,336	1,728.3
15	88.9	65.6	-319,102	2,298.1	-449,239	1,676.7	0	0.0	0	0.0	-408,592	1,684.8
16	**86.9**	**65.2**	**-280,354**	**2,311.4**	-444,668	1,632.8	0	0.0	0	0.0	-419,645	1,632.0
17	85.9	64.9	-416,597	2,146.8	-488,563	1,476.1	0	0.0	0	0.0	-454,375	1,498.4
18	84.9	64.4	-549,117	1,745.1	-633,507	1,222.2	0	0.0	0	0.0	-602,652	1,275.5
19	82.9	63.8	-616,505	1,274.0	-683,701	847.5	0	0.0	0	0.0	-663,473	903.3
20	78.9	62.4	-666,004	1,139.0	-727,255	768.5	0	0.0	0	0.0	-713,085	845.4
21	76.9	61.7	-704,551	1,106.1	-758,366	745.7	0	0.0	0	0.0	-753,283	842.1
22	75.9	61.3	-3,443	0.0	-3,707	0.0	0	0.0	0	0.0	-3,707	0.0
23	74.9	60.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
24	72.9	60.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

October	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	62.0	57.3	0	0.0	0	0.0	-15,160	0.0	0	0.0	0	0.0
2	61.0	56.5	0	0.0	-8,332	0.0	-21,589	0.0	0	0.0	0	0.0
3	61.0	56.3	0	0.0	-17,979	0.0	-24,548	0.0	-4,255	0.0	-4,255	0.0
4	60.0	55.4	0	0.0	-24,781	0.0	-29,720	0.0	-6,100	0.0	-6,100	0.0
5	60.0	55.0	0	0.0	-28,075	0.0	-31,861	0.0	-8,978	0.0	-8,978	0.0
6	59.0	54.6	0	0.0	-33,224	0.0	-34,216	0.0	-10,868	0.0	-10,868	0.0
7	59.0	54.6	-383,573	335.2	-768,764	162.1	-27,931	0.0	-10,657	0.0	-461,546	193.4
8	62.0	56.0	-443,346	490.1	-881,933	190.2	-6,724	0.0	-4,698	0.0	-574,022	234.7
9	66.0	57.8	-595,506	902.5	-773,729	473.7	0	0.0	0	0.0	-665,440	441.8
10	70.0	59.8	-539,492	991.6	-600,080	630.5	0	0.0	0	0.0	-590,624	646.4
11	72.0	60.5	-510,251	1,145.8	-550,429	769.2	0	0.0	0	0.0	-550,878	739.5
12	74.0	61.2	-523,874	1,294.7	-575,475	855.3	0	0.0	0	0.0	-581,102	827.7
13	76.0	62.1	-664,472	1,343.2	-723,002	859.7	0	0.0	0	0.0	-744,840	834.5
14	76.0	62.3	-535,750	1,491.2	-593,394	931.7	0	0.0	0	0.0	-602,636	883.8
15	74.0	62.0	-481,106	1,679.3	-540,275	925.4	0	0.0	0	0.0	-545,586	867.0
16	72.0	61.3	-472,319	1,734.4	-532,565	863.6	0	0.0	0	0.0	-534,945	823.2
17	70.0	60.7	-521,116	1,520.9	-597,828	767.7	0	0.0	0	0.0	-603,170	719.2
18	68.0	60.0	-660,074	1,200.9	-756,478	655.9	0	0.0	0	0.0	-765,095	618.4
19	66.0	59.3	-710,189	829.8	-782,452	555.7	0	0.0	0	0.0	-783,067	548.2
20	66.0	59.3	-762,829	752.7	-859,491	516.2	0	0.0	0	0.0	-833,531	509.4
21	64.0	58.5	-795,180	750.2	-1,243,570	514.5	0	0.0	0	0.0	-1,240,604	508.4
22	64.0	58.5	-3,871	0.0	-5,461	0.0	0	0.0	0	0.0	-5,461	0.0
23	64.0	58.4	0	0.0	-5,148	0.0	0	0.0	0	0.0	-5,148	0.0
24	63.0	58.0	0	0.0	-9,103	0.0	0	0.0	0	0.0	-9,103	0.0

November	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	58.0	50.5	-14,793	0.0	-23,476	0.0	-31,180	0.0	-15,168	0.0	-15,168	0.0
2	57.0	49.8	-20,145	0.0	-31,527	0.0	-39,350	0.0	-19,343	0.0	-19,343	0.0
3	56.0	49.1	-24,745	0.0	-41,291	0.0	-43,736	0.0	-25,411	0.0	-25,411	0.0
4	55.0	48.1	-30,075	0.0	-47,081	0.0	-47,415	0.0	-30,855	0.0	-30,855	0.0
5	54.0	47.6	-31,931	0.0	-50,525	0.0	-50,826	0.0	-35,037	0.0	-35,037	0.0
6	54.0	47.1	-31,467	0.0	-51,782	0.0	-51,902	0.0	-41,891	0.0	-41,832	0.0
7	54.0	46.9	-1,981,137	150.0	-2,313,711	68.5	-52,122	0.0	-43,724	0.0	-3,588,659	64.1
8	56.0	48.0	-1,049,967	204.2	-1,340,520	124.7	-26,481	0.0	-24,493	0.0	-3,045,647	123.6
9	60.0	49.8	-1,077,781	462.0	-1,719,394	204.6	-8,409	0.0	-8,409	0.0	-5,127,371	190.9
10	64.0	52.0	-608,459	563.1	-923,923	299.5	0	0.0	0	0.0	-3,091,948	286.8
11	68.0	54.4	-560,599	780.6	-693,388	463.7	0	0.0	0	0.0	-1,220,345	449.3
12	69.0	55.5	-588,093	887.8	-680,499	509.4	0	0.0	0	0.0	-747,926	495.0
13	70.0	56.6	-746,652	892.9	-860,429	479.9	0	0.0	0	0.0	-908,980	474.8
14	72.0	58.4	-578,582	1,037.4	-675,318	608.6	0	0.0	0	0.0	-681,262	586.0
15	71.0	58.2	-520,530	1,144.7	-605,873	607.1	0	0.0	0	0.0	-611,745	581.4
16	70.0	58.0	-510,468	1,178.1	-590,754	583.7	0	0.0	0	0.0	-598,311	560.6
17	68.0	57.3	-574,934	1,014.0	-676,586	524.2	0	0.0	0	0.0	-677,812	502.8
18	66.0	56.5	-732,458	834.5	-889,104	473.6	0	0.0	0	0.0	-912,126	448.0
19	64.0	55.3	-776,004	658.3	-1,161,784	447.7	0	0.0	0	0.0	-1,160,498	430.9
20	62.0	54.2	-812,916	612.3	-1,327,289	425.8	0	0.0	0	0.0	-1,338,094	418.1
21	62.0	53.8	-926,920	610.0	-1,474,872	430.0	0	0.0	0	0.0	-1,483,656	424.1
22	60.0	52.5	-4,111	0.0	-8,959	0.0	-2,934	0.0	-2,934	0.0	-8,959	0.0
23	60.0	52.2	-3,141	0.0	-13,363	0.0	-7,332	0.0	-7,332	0.0	-13,363	0.0
24	58.0	51.0	-6,628	0.0	-23,467	0.0	-11,951	0.0	-11,951	0.0	-23,467	0.0

December	Typical Weather (°F)		Design		Weekday		Saturday		Sunday		Monday	
Hour	OADB	OAWB	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)	Htg (Btuh)	Clg (Tons)
1	54.0	48.3	-30,228	0.0	-38,890	0.0	-47,819	0.0	-32,046	0.0	-32,046	0.0
2	54.0	47.6	-39,032	0.0	-50,552	0.0	-51,484	0.0	-35,224	0.0	-35,224	0.0
3	53.0	46.7	-42,767	0.0	-53,766	0.0	-54,188	0.0	-79,138	0.0	-103,889	0.0
4	53.0	46.5	-45,187	0.0	-55,067	0.0	-55,191	0.0	-136,767	0.0	-136,767	0.0
5	52.0	46.0	-46,439	0.0	-57,583	0.0	-57,640	0.0	-143,156	0.0	-170,827	0.0
6	51.0	45.0	-45,673	0.0	-61,129	0.0	-61,344	0.0	-160,890	0.0	-286,741	0.0
7	50.0	44.4	-3,330,731	129.3	-3,382,920	61.1	-64,784	0.0	-169,759	0.0	-4,451,213	45.1
8	54.0	46.5	-1,896,804	168.0	-2,208,294	80.0	-44,399	0.0	-189,552	0.0	-4,748,961	68.0
9	58.0	47.7	-2,971,112	281.1	-3,643,234	131.0	-15,498	0.0	-17,780	0.0	-6,868,816	140.3
10	62.0	50.7	-1,465,182	359.9	-1,916,108	228.4	-2,987	0.0	-2,987	0.0	-5,206,103	246.0
11	66.0	52.8	-760,579	540.1	-935,920	377.6	0	0.0	0	0.0	-3,553,722	370.3
12	67.0	53.5	-652,116	670.4	-835,751	430.1	0	0.0	0	0.0	-2,382,028	426.5
13	68.0	54.4	-830,371	689.6	-1,105,243	404.0	0	0.0	0	0.0	-1,698,622	405.5
14	68.0	54.8	-619,760	826.9	-750,072	458.3	0	0.0	0	0.0	-870,793	446.6
15	68.0	55.5	-558,611	879.7	-668,373	482.4	0	0.0	0	0.0	-741,832	462.8
16	66.0	55.7	-550,435	893.5	-690,801	422.7	0	0.0	0	0.0	-769,485	409.2
17	64.0	54.0	-622,319	775.6	-788,754	396.9	0	0.0	0	0.0	-873,481	384.2
18	62.0	53.1	-782,018	644.2	-1,296,204	372.6	0	0.0	0	0.0	-1,423,827	365.1
19	60.0	52.4	-817,691	583.4	-1,487,140	398.0	0	0.0	0	0.0	-1,492,844	381.3
20	59.0	51.4	-972,216	548.0	-1,601,257	387.9	-7,296	0.0	-7,296	0.0	-1,626,197	378.2
21	58.0	50.9	-1,333,335	547.0	-1,622,189	393.7	-13,384	0.0	-13,384	0.0	-1,659,287	383.3
22	57.0	50.0	-7,594	0.0	-12,892	0.0	-16,227	0.0	-16,227	0.0	-12,892	0.0
23	56.0	49.7	-11,066	0.0	-24,460	0.0	-21,732	0.0	-21,732	0.0	-24,460	0.0
24	56.0	49.5	-21,432	0.0	-34,334	0.0	-26,986	0.0	-26,986	0.0	-34,334	0.0

EXISTING PEAK SUMMER CAMPUS COOLING LOAD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Appendix D - Economic Analysis

TYPICAL JUNE DAY COLLEGE LOAD PROFILE						ALTERNATIVE #1 - CHILLER PLANT WITH TES															ALTERNATIVE #2 - EXISTING CHILLER PLANT											
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816.0	816.0	816.0	0.0	0.0	10,447	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816.0	816.0	816.0	0.0	0.0	12,895	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3	Off-Peak; TES Charging	2	3	0.0%	0	816.0	816.0	816.0	0.0	0.0	15,343	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4		3	4	0.0%	0	816.0	816.0	577.1	0.0	0.0	17,791	1,546.4	18	2,945	58	182	0	0	61	54	0	0	1,902	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0.0	0.0	0.0	0.0	0.0	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0.0	0.0	0.0	0.0	0.0	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	14.9%	297	0.0	0.0	0.0	0.0	0.0	20,000.0	0.0	18	396	0	25	0	0	0	0	0	0	25	297	0	0	0	208.1	18	396	0	0	25	0	0	6	18	0	0	257
8		7	8	25.8%	516.7	0.0	0.0	0.0	0.0	0.0	19,483.3	0.0	18	689	0	43	0	0	0	0	0	0	43	517	0	0	0	361.7	18	689	0	0	43	0	0	11	18	0	0	433
9		8	9	67.2%	1,344.5	0.0	0.0	0.0	0.0	0.0	18,138.7	0.0	18	1,793	0	111	0	0	0	0	0	0	111	816	529	0	0	941.2	18	1,793	0	111	0	0	0	28	36	0	0	1,116
10	Mid-Peak; TES Discharging	9	10	68.0%	1,360.4	0.0	0.0	0.0	0.0	0.0	16,778.4	0.0	18	1,814	0	112	0	0	0	0	0	0	112	816	544	0	0	952.3	18	1,814	0	112	0	0	0	28	36	0	0	1,129
11		10	11	74.8%	1,495.1	0.0	0.0	0.0	0.0	0.0	15,283.2	0.0	18	1,994	0	123	0	0	0	0	0	0	123	816	679	0	0	1,046.6	18	1,994	0	123	0	0	0	31	36	0	0	1,237
12		11	12	83.7%	1,674.7	0.0	0.0	0.0	0.0	0.0	13,608.5	0.0	18	2,233	0	138	0	0	0	0	0	0	138	816	816	43	0	1,172.3	18	2,176	57	135	10	2	35	36	36	17	7	1,413
13		12	13	85.7%	1,714.6	0.0	0.0	0.0	0.0	0.0	11,893.9	0.0	18	2,286	0	141	0	0	0	0	0	0	141	816	816	83	0	1,200.2	18	2,176	110	135	10	3	36	36	18	7	1,444
14		13	14	92.6%	1,851.1	0.0	0.0	0.0	0.0	0.0	10,042.8	0.0	18	2,468	0	153	0	0	0	0	0	0	153	816	816	219	0	1,295.8	18	2,176	292	135	10	8	39	36	19	7	1,549
15	On-Peak; TES Discharge	14	15	97.9%	1,957.7	0.0	0.0	0.0	0.0	0.0	8,085.1	0.0	18	2,610	0	162	0	0	0	0	0	0	162	816	816	250	76	1,370.4	18	2,176	434	135	20	12	41	36	20	13	1,647
16		15	16	99.2%	1,984.9	0.0	0.0	0.0	0.0	0.0	6,100.2	0.0	18	2,647	0	164	0	0	0	0	0	0	164	816	816	250	103	1,389.4	18	2,176	471	135	20	13	41	36	21	13	1,668
17		16	17	89.0%	1,779.8	0.0	0.0	0.0	0.0	0.0	4,320.4	0.0	18	2,373	0	147	0	0	0	0	0	0	147	816	816	148	0	1,245.9	18	2,176	197	135	10	5	37	36	19	7	1,494
18		17	18	73.7%	1,473.7	0.0	0.0	0.0	0.0	0.0	2,846.7	0.0	18	1,965	0	122	0	0	0	0	0	0	122	816	658	0	0	1,031.6	18	1,965	0	122	0	0	0	31	36	0	0	1,220
19		18	19	55.5%	1,109.5	0.0	0.0	0.0	0.0	0.0	1,737.3	0.0	18	1,479	0	92	0	0	0	0	0	0	92	816	293	0	0	776.6	18	1,479	0	92	0	0	0	23	36	0	0	927
20	Mid-Peak; TES Discharging	19	20	46.1%	922.9	0.0	0.0	0.0	0.0	0.0	814.4	0.0	18	1,231	0	76	0	0	0	0	0	0	76	816	0	0	0	571.2	18	1,088	0	67	0	0	0	19	18	0	0	676
21		20	21	44.2%	884.4	0.0	0.0	0.0	0.0	0.0	852.9	0.0	18	0	0	0	0	0	0	0	0	0	0	816	0	0	0	571.2	18	1,088	0	67	0	0	0	18	18	0	0	675
22		21	22	0.0%	0.0	816.0	816.0	816.0	0.0	0.0	3,300.9	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
23		22	23	0.0%	0.0	816.0	816.0	816.0	0.0	0.0	5,748.9	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24	Off-Peak; TES Charging	23	24	0.0%	0	750	750	750	0	0	7,999	1,575.0	18	3,000	58	186	0	0	63	54	0	0	1,935	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	11,689.4										15,921.8																16,882.8

TYPICAL JULY DAY COLLEGE LOAD PROFILE						ALTERNATIVE #1 - CHILLER PLANT WITH TES															ALTERNATIVE #2 - EXISTING CHILLER PLANT											
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816.0	816.0	816.0	0.0	0.0	10,759	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816.0	816.0	816.0	0.0	0.0	13,207	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3	Off-Peak; TES Charging	2	3	0.0%	0	816.0	816.0	816.0	0.0	0.0	15,655	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4		3	4	0.0%	0	816.0	816.0	264.6	0.0	0.0	18,103	1,327.6	18	2,529	58	156	0	0	53	54	0	0	1,649	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0.0	0.0	0.0	0.0	0.0	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0.0	0.0	0.0	0.0	0.0	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	21.3%	425	425.4	0.0	0.0	0.0	0.0	20,000.0	297.8	18	567	19	35	0	0	12	18	0	0	382	425	0	0	0	297.8	18	567	0	35	0	0	9	18	0	0	0	360
8		7	8	35.0%	700.8	700.8	0.0	0.0	0.0	0.0	20,000.0	490.6	18	934	19	58	0	0	19	18	0	0	605	701	0	0	0	490.6	18	934	0	58	0	0	15	18	0	0	0	581
9		8	9	86.0%	1,720.8	816.0	816.0	88.8	0.0	0.0	20,000.0	1,204.6	18	2,294	58	142	0	0	48	54	0	0	1,506	816	816	89	0	1,204.6	18	2,176	118	135	10	3	36	36	18	7	1,449
10	Mid-Peak; TES Discharging	9	10	89.9%	1,797.4	816.0	816.0	165.4	0.0	0.0	20,000.0	1,258.2	18	2,397	58	148	0	0	50	54	0	0	1,568	816	816	165	0	1,258.2	18	2,176	221	135	10	6	37	36	19	7	1,507
11		10	11	96.1%	1,922.8	0.0	0.0	0.0	0.0	0.0	18,077.2	0.0	18	2,564	0	159	0	0	0	0	0	0	159	816	816	250	41	1,346.0	18	2,176	388	135	20	10	40	36	20	13	1,620
12		11	12	101.7%	2,034.9	0.0	0.0	0.0	0.0	0.0	16,042.2	0.0	18	2,713	0	168	0	0	0	0	0	0	168	816	816	250	153	1,424.5	18	2,176	537	135	20	14	42	36	21	13	1,706
13		12	13	104.9%	2,098.9	0.0	0.0	0.0	0.0	0.0	13,943.3	0.0	18	2,799	0	173	0	0	0	0	0	0	173	816	816	250	217	1,469.2	18	2,176	623	135	20	17	44	36	22	13	1,755
14		13	14	110.7%	2,214.6	0.0	0.0	0.0	0.0	0.0	11,728.7	0.0	18	2,953	0	183	0	0	0	0	0	0	183	816	816	250	250	1,492.4	18	2,176	667	135	20	18	46	36	23	13	1,783
15	On-Peak; TES Discharge	14	15	113.5%	2,270.5	0.0	0.0	0.0	0.0	0.0	9,458.2	0.0	18	3,027	0	187	0	0	0	0	0	0	187	816	816	250	250	1,492.4	18	2,176	667	135	20	18	47	36	24	13	1,785
16		15	16	115.0%	2,299.5	0.0	0.0	0.0	0.0	0.0	7,158.7	0.0	18	3,066	0	190	0	0	0	0	0	0	190	816	816	250	250	1,492.4	18	2,176	667	135	20	18	48	36	24	13	1,786
17		16	17	106.7%	2,133.2	0.0	0.0	0.0	0.0	0.0	5,025.5	0.0	18	2,844	0	176	0	0	0	0	0	0	176	816	816	250	251	1,493.3	18	2,176	668	135	20	18	44	36	22	13	1,781
18		17	18	87.7%	1,753.1	0.0	0.0	0.0	0.0	0.0	3,272.4	0.0	18	2,337	0	145	0	0	0	0	0	0	145	816	816	121	0	1,227.1	18	2,176	161	135	10	0	37	36	0	7	1,451
19		18	19	61.7%	1,233.1	0.0	0.0	0.0	0.0	0.0	2,039.3	0.0	18	1,644	0	102	0	0	0	0	0	0	102	816	417	0	0	863.2	18	1,644	0	102	0	0	26	36	0	0	1,026
20	Mid-Peak; TES Discharging	19	20	57.4%	1,147.7	0.0	0.0	0.0	0.0	0.0	891.6	0.0	18	1,530	0	95	0	0	0	0	0	0	95	816	332	0	0	803.4	18	1,530	0	95	0	0	24	36	0	0	958
21		20	21	53.6%	1,071.9	0.0	0.0	0.0	0.0	0.0	967.4	0.0	18	0	0	0	0	0	0	0	0	0	0	816	256	0	0	750.3	18	1,429	0	88	0	0	22	36	0	0	897
22		21	22	0.0%	0.0	816.0	816.0	816.0	0.0	0.0	3,415.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
23		22	23	0.0%	0.0	816.0	816.0	816.0	0.0	0.0	5,863.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24	Off-Peak; TES Charging	23	24	0.0%	0	816	816	816	0	0	8,311	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	14,860.3										19,859.9																20,445.1

TYPICAL AUGUST DAY COLLEGE LOAD PROFILE

Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)
1		0	1	0.0%	0	816.0	816.0	816.0	0.0	0.0
2		1	2	0.0%	0	816.0	816.0	816.0	0.0	0.0
3		2	3	0.0%	0	816.0	816.0	816.0	0.0	0.0
4	Off-Peak; TES Charging	3	4	0.0%	0	816.0	816.0	678.7	0.0	0.0
5		4	5	0.0%	0	0.0	0.0	0.0	0.0	0.0
6		5	6	0.0%	0	0.0	0.0	0.0	0.0	0.0
7		6	7	22.9%	458	457.7	0.0	0.0	0.0	0.0
8		7	8	37.1%	742.4	742.4	0.0	0.0	0.0	0.0
9		8	9	89.1%	1,782.3	816.0	816.0	150.3	0.0	0.0
10	Mid-Peak; TES Discharging	9	10	91.8%	1,835.8	816.0	816.0	203.8	0.0	0.0
11		10	11	98.5%	1,970.6	0.0	0.0	0.0	0.0	0.0
12		11	12	106.6%	2,131.6	0.0	0.0	0.0	0.0	0.0
13		12	13	109.1%	2,182.8	0.0	0.0	0.0	0.0	0.0
14		13	14	113.6%	2,272.4	0.0	0.0	0.0	0.0	0.0
15	On-Peak; TES Discharge	14	15	115.0%	2,300.4	0.0	0.0	0.0	0.0	0.0
16		15	16	115.1%	2,301.8	0.0	0.0	0.0	0.0	0.0
17		16	17	107.1%	2,142.6	0.0	0.0	0.0	0.0	0.0
18		17	18	87.8%	1,756.0	0.0	0.0	0.0	0.0	0.0
19		18	19	63.8%	1,276.6	0.0	0.0	0.0	0.0	0.0
20		19	20	57.6%	1,151.1	0.0	0.0	0.0	0.0	0.0
21	Mid-Peak; TES Discharging	20	21	55.6%	1,112.0	0.0	0.0	0.0	0.0	0.0
22		21	22	0.0%	0.0	816.0	816.0	816.0	0.0	0.0
23		22	23	0.0%	0.0	816.0	816.0	816.0	0.0	0.0
24	Off-Peak; TES Charging	23	24	0.0%	0	816	816	816	0	0

ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES

Line No.	TES Stored Capacity	Water-Cooled Chiller kW	CHW ∆T	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand
1	10,345	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
2	12,793	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
3	15,241	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
4	17,689	1,617.5	18	3,081	58	191	0	0	64	54	0	0	1,984
5	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0
6	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0
7	20,000.0	320.4	18	610	19	38	0	0	13	18	0	0	408
8	20,000.0	519.7	18	990	19	61	0	0	21	18	0	0	639
9	20,000.0	1,247.6	18	2,376	58	147	0	0	50	54	0	0	1,556
10	20,000.0	1,285.0	18	2,448	58	151	0	0	51	54	0	0	1,599
11	18,029.4	0.0	18	2,627	0	163	0	0	0	0	0	0	163
12	15,897.9	0.0	18	2,842	0	176	0	0	0	0	0	0	**176**
13	13,715.1	0.0	18	2,910	0	180	0	0	0	0	0	0	180
14	11,442.7	0.0	18	3,030	0	187	0	0	0	0	0	0	187
15	9,142.4	0.0	18	3,067	0	190	0	0	0	0	0	0	190
16	6,840.5	0.0	18	3,069	0	190	0	0	0	0	0	0	190
17	4,697.9	0.0	18	2,857	0	177	0	0	0	0	0	0	177
18	2,941.9	0.0	18	2,341	0	145	0	0	0	0	0	0	145
19	1,665.3	0.0	18	1,702	0	105	0	0	0	0	0	0	105
20	514.2	0.0	18	1,535	0	95	0	0	0	0	0	0	95
21	553.3	0.0	18	0	0	0	0	0	0	0	0	0	0
22	3,001.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
23	5,449.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
24	7,897	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
	total kW-Hr	15,271.7											20,367.2

ALTERNATIVE #2 - EXISTING CHILLER PLANT

Line No.	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7	458	0	0	0	320.4	18	610	0	38	0	0	10	18	0	0	386
8	742	0	0	0	519.7	18	990	0	61	0	0	15	18	0	0	614
9	816	816	150	0	1,247.6	18	2,176	200	135	10	5	37	36	19	7	1,496
10	816	816	204	0	1,285.0	18	2,176	272	135	10	7	38	36	19	7	1,537
11	816	816	250	89	1,379.4	18	2,176	451	135	20	12	41	36	21	13	1,657
12	816	816	250	250	1,492.1	18	2,176	666	135	20	18	44	36	22	13	**1,780**
13	816	816	250	250	1,492.4	18	2,176	667	135	20	18	46	36	23	13	1,782
14	816	816	250	250	1,492.4	18	2,176	667	135	20	18	47	36	24	13	1,785
15	816	816	250	252	1,493.8	18	2,176	669	135	20	18	48	36	24	13	1,787
16	816	816	250	250	1,492.4	18	2,176	667	135	20	18	48	36	24	13	1,786
17	816	816	250	250	1,492.4	18	2,176	667	135	20	18	45	36	22	13	1,781
18	816	816	124	0	1,229.2	18	2,176	165	135	10	0	37	36	0	7	1,453
19	816	461	0	0	893.6	18	1,702	0	105	0	0	27	36	0	0	1,061
20	816	335	0	0	805.8	18	1,535	0	95	0	0	24	36	0	0	961
21	816	296	0	0	778.4	18	1,483	0	92	0	0	23	36	0	0	929
22	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
																20,794.3

TYPICAL SEPTEMBER DAY COLLEGE LOAD PROFILE

Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)
1		0	1	0.0%	0	816.0	816.0	816.0	0.0	0.0
2		1	2	0.0%	0	816.0	816.0	816.0	0.0	0.0
3		2	3	0.0%	0	816.0	816.0	816.0	0.0	0.0
4	Off-Peak; TES Charging	3	4	0.0%	0	816.0	816.0	635.8	0.0	0.0
5		4	5	0.0%	0	0.0	0.0	0.0	0.0	0.0
6		5	6	0.0%	0	0.0	0.0	0.0	0.0	0.0
7		6	7	24.2%	484	484.0	0.0	0.0	0.0	0.0
8		7	8	35.3%	706.5	706.5	0.0	0.0	0.0	0.0
9		8	9	87.2%	1,743.2	816.0	816.0	111.2	0.0	0.0
10	Mid-Peak; TES Discharging	9	10	90.8%	1,815.4	816.0	816.0	183.4	0.0	0.0
11		10	11	98.0%	1,959.0	0.0	0.0	0.0	0.0	0.0
12		11	12	105.3%	2,106.4	0.0	0.0	0.0	0.0	0.0
13		12	13	110.2%	2,203.6	0.0	0.0	0.0	0.0	0.0
14		13	14	112.7%	2,253.3	0.0	0.0	0.0	0.0	0.0
15	On-Peak; TES Discharge	14	15	114.9%	2,298.1	0.0	0.0	0.0	0.0	0.0
16		15	16	115.6%	2,311.4	0.0	0.0	0.0	0.0	0.0
17		16	17	107.3%	2,146.8	0.0	0.0	0.0	0.0	0.0
18		17	18	87.3%	1,745.1	0.0	0.0	0.0	0.0	0.0
19		18	19	63.7%	1,274.0	0.0	0.0	0.0	0.0	0.0
20		19	20	56.9%	1,139.0	0.0	0.0	0.0	0.0	0.0
21	Mid-Peak; TES Discharging	20	21	55.3%	1,106.1	0.0	0.0	0.0	0.0	0.0
22		21	22	0.0%	0.0	816.0	816.0	816.0	0.0	0.0
23		22	23	0.0%	0.0	816.0	816.0	816.0	0.0	0.0
24	Off-Peak; TES Charging	23	24	0.0%	0	816	816	816	0	0

ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES

Line No.	TES Stored Capacity	Water-Cooled Chiller kW	CHW ∆T	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand
1	10,388	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
2	12,836	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
3	15,284	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
4	17,732	1,587.5	18	3,024	58	187	0	0	63	54	0	0	1,949
5	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0
6	20,000	0.0	18	0	0	0	0	0	0	0	0	0	0
7	20,000.0	338.8	18	645	19	40	0	0	13	18	0	0	429
8	20,000.0	494.5	18	942	19	58	0	0	20	18	0	0	610
9	20,000.0	1,220.3	18	2,324	58	144	0	0	48	54	0	0	1,524
10	20,000.0	1,270.8	18	2,421	58	150	0	0	50	54	0	0	1,583
11	18,041.0	0.0	18	2,612	0	162	0	0	0	0	0	0	162
12	15,934.6	0.0	18	2,809	0	174	0	0	0	0	0	0	174
13	13,731.0	0.0	18	2,938	0	182	0	0	0	0	0	0	182
14	11,477.7	0.0	18	3,004	0	186	0	0	0	0	0	0	186
15	9,179.7	0.0	18	3,064	0	190	0	0	0	0	0	0	190
16	6,868.3	0.0	18	3,082	0	191	0	0	0	0	0	0	**191**
17	4,721.4	0.0	18	2,862	0	177	0	0	0	0	0	0	177
18	2,976.4	0.0	18	2,327	0	144	0	0	0	0	0	0	144
19	1,702.3	0.0	18	1,699	0	105	0	0	0	0	0	0	105
20	563.4	0.0	18	1,519	0	94	0	0	0	0	0	0	94
21	596.2	0.0	18	0	0	0	0	0	0	0	0	0	0
22	3,044.2	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
23	5,492.2	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
24	7,940	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096
	total kW-Hr	15,193.4											20,272.5

ALTERNATIVE #2 - EXISTING CHILLER PLANT

Line No.	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7	484	0	0	0	338.8	18	645	0	40	0	0	10	18	0	0	407
8	706	0	0	0	494.5	18	942	0	58	0	0	15	18	0	0	585
9	816	816	111	0	1,220.3	18	2,176	148	135	10	4	36	36	18	7	1,466
10	816	816	183	0	1,270.8	18	2,176	245	135	10	7	38	36	19	7	1,521
11	816	816	250	77	1,371.3	18	2,176	436	135	20	12	41	36	20	13	1,648
12	816	816	250	224	1,474.5	18	2,176	633	135	20	17	44	36	22	13	1,761
13	816	816	250	250	1,492.4	18	2,176	667	135	20	18	46	36	23	13	1,783
14	816	816	250	250	1,492.4	18	2,176	667	135	20	18	47	36	24	13	1,784
15	816	816	250	250	1,492.4	18	2,176	667	135	20	18	48	36	24	13	1,786
16	816	816	250	250	1,492.4	18	2,176	667	135	20	18	48	36	24	13	**1,786**
17	816	816	250	250	1,492.4	18	2,176	667	135	20	18	45	36	22	13	1,781
18	816	816	113	0	1,221.6	18	2,176	151	135	10	0	36	36	0	7	1,445
19	816	458	0	0	891.8	18	1,699	0	105	0	0	27	36	0	0	1,059
20	816	323	0	0	797.3	18	1,519	0	94	0	0	24	36	0	0	951
21	816	290	0	0	774.3	18	1,475	0	91	0	0	23	36	0	0	924
22	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
	11,798.5			1,551.4	17,317.1	432.0	28,039.4	4,945.5								20,687.4

TYPICAL OCTOBER DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES											ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	10,881.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816	816	816	0.0	0.0	13,329.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	816	816	816	0.0	0.0	15,777.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES Charging	3	4	0.0%	0	816	816	816	0.0	0.0	18,225.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	816	816	143	0.0	0.0	20,000.0	1,242.2	18	2,366	58	146	0	0	49	54	0	0	1,550	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	16.8%	335.2	0	0	0	0.0	0.0	19,664.8	0.0	18	447	0	28	0	0	0	0	0	0	28	0	0	250	85	234.7	18	0	447	0	14	12	0	0	3	13	278
9		8	9	24.5%	490.1	0.0	0.0	0.0	0.0	0.0	19,174.6	0.0	18	654	0	40	0	0	0	0	0	0	40	0	0	250	240	343.1	18	0	654	0	14	18	0	0	5	13	393
10		9	10	45.1%	902.5	0.0	0.0	0.0	0.0	0.0	18,272.1	0.0	18	1,203	0	74	0	0	0	0	0	0	74	816	87	0	0	631.8	18	1,203	0	74	0	0	19	36	0	0	761
11		10	11	49.6%	991.6	0.0	0.0	0.0	0.0	0.0	17,280.5	0.0	18	1,322	0	82	0	0	0	0	0	0	82	816	176	0	0	694.1	18	1,322	0	82	0	0	21	36	0	0	832
12		11	12	57.3%	1,145.8	0.0	0.0	0.0	0.0	0.0	16,134.7	0.0	18	1,528	0	95	0	0	0	0	0	0	95	816	330	0	0	802.0	18	1,528	0	95	0	0	24	36	0	0	956
13		12	13	64.7%	1,294.7	0.0	0.0	0.0	0.0	0.0	14,839.9	0.0	18	1,726	0	107	0	0	0	0	0	0	107	816	479	0	0	906.3	18	1,726	0	107	0	0	27	36	0	0	1,076
14		13	14	67.2%	1,343.2	0.0	0.0	0.0	0.0	0.0	13,496.8	0.0	18	1,791	0	111	0	0	0	0	0	0	111	816	527	0	0	940.2	18	1,791	0	111	0	0	28	36	0	0	1,115
15	Mid-Peak; TES	14	15	74.6%	1,491.2	0.0	0.0	0.0	0.0	0.0	12,005.5	0.0	18	1,988	0	123	0	0	0	0	0	0	123	816	675	0	0	1,043.9	18	1,988	0	123	0	0	31	36	0	0	1,234
16		15	16	84.0%	1,679.3	0.0	0.0	0.0	0.0	0.0	10,326.3	0.0	18	2,239	0	139	0	0	0	0	0	0	139	816	816	47	0	1,175.5	18	2,176	63	135	7	2	35	36	18	7	1,414
17		16	17	86.7%	1,734.4	0.0	0.0	0.0	0.0	0.0	8,591.9	0.0	18	2,312	0	143	0	0	0	0	0	0	143	816	816	102	0	1,214.0	18	2,176	136	135	7	4	36	36	18	7	1,456
18		17	18	76.0%	1,520.9	0.0	0.0	0.0	0.0	0.0	7,071.0	0.0	18	2,028	0	125	0	0	0	0	0	0	125	816	705	0	0	1,064.7	18	2,028	0	125	0	0	32	36	0	0	1,258
19		18	19	60.0%	1,200.9	0.0	0.0	0.0	0.0	0.0	5,870.1	0.0	18	1,601	0	99	0	0	0	0	0	0	99	816	385	0	0	840.6	18	1,601	0	99	0	0	25	36	0	0	1,001
20		19	20	41.5%	829.8	0.0	0.0	0.0	0.0	0.0	5,040.3	0.0	18	1,106	0	68	0	0	0	0	0	0	68	816	14	0	0	580.9	18	1,106	0	68	0	0	17	36	0	0	702
21		20	21	37.6%	752.7	0.0	0.0	0.0	0.0	0.0	4,287.5	0.0	18	1,004	0	62	0	0	0	0	0	0	62	753	0	0	0	526.9	18	1,004	0	62	0	0	16	18	0	0	623
22	Off-Peak; TES Charging	21	22	37.5%	750.2	0.0	0.0	0.0	0.0	0.0	3,537.4	0.0	18	1,000	0	62	0	0	0	0	0	0	62	750	0	0	0	525.1	18	1,000	0	62	0	0	16	18	0	0	621
23		22	23	0.0%	0.0	816	816	816	0.0	0.0	5,985.4	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	8,433	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	11,523.8											15,481.0	11,524			35	44	40	40	13,719										13,719.2

TYPICAL NOVEMBER DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES											ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	16,314.0	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816	816	816	0.0	0.0	18,762.0	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	816	422	0	0.0	0.0	20,000.0	866.6	18	1,651	39	102	0	0	34	36	0	0	1,078	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES Charging	3	4	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	7.5%	150.0	0	0	0	0.0	0.0	19,850.0	0.0	18	200	0	12	0	0	0	0	0	0	12	0	0	150	0	105.0	18	0	200	0	7	5	0	0	2	7	126
9		8	9	10.2%	204.2	0.0	0.0	0.0	0.0	0.0	19,645.7	0.0	18	272	0	17	0	0	0	0	0	0	17	0	0	204	0	143.0	18	0	272	0	7	7	0	0	2	7	166
10		9	10	23.1%	462.0	0.0	0.0	0.0	0.0	0.0	19,183.8	0.0	18	616	0	38	0	0	0	0	0	0	38	462	0	0	0	323.4	18	616	0	38	0	0	10	18	0	0	389
11		10	11	28.2%	563.1	0.0	0.0	0.0	0.0	0.0	18,620.6	0.0	18	751	0	46	0	0	0	0	0	0	46	563	0	0	0	394.2	18	751	0	46	0	0	12	18	0	0	470
12		11	12	39.0%	780.6	0.0	0.0	0.0	0.0	0.0	17,840.0	0.0	18	1,041	0	64	0	0	0	0	0	0	64	781	0	0	0	546.4	18	1,041	0	64	0	0	16	18	0	0	645
13		12	13	44.4%	887.8	0.0	0.0	0.0	0.0	0.0	16,952.2	0.0	18	1,184	0	73	0	0	0	0	0	0	73	816	0	0	0	571.2	18	1,088	0	67	0	0	19	18	0	0	675
14	Mid-Peak; TES	13	14	44.6%	892.9	0.0	0.0	0.0	0.0	0.0	16,059.3	0.0	18	1,191	0	74	0	0	0	0	0	0	74	816	0	0	0	571.2	18	1,088	0	67	0	0	19	18	0	0	675
15		14	15	51.9%	1,037.4	0.0	0.0	0.0	0.0	0.0	15,021.9	0.0	18	1,383	0	86	0	0	0	0	0	0	86	816	221	0	0	726.2	18	1,383	0	86	0	0	22	36	0	0	869
16		15	16	57.2%	1,144.7	0.0	0.0	0.0	0.0	0.0	13,877.1	0.0	18	1,526	0	94	0	0	0	0	0	0	94	816	329	0	0	801.3	18	1,526	0	94	0	0	24	36	0	0	955
17		16	17	58.9%	1,178.1	0.0	0.0	0.0	0.0	0.0	12,699.1	0.0	18	1,571	0	97	0	0	0	0	0	0	97	816	362	0	0	824.6	18	1,571	0	97	0	0	25	36	0	0	982
18		17	18	50.7%	1,014.0	0.0	0.0	0.0	0.0	0.0	11,685.1	0.0	18	1,352	0	84	0	0	0	0	0	0	84	816	198	0	0	709.8	18	1,352	0	84	0	0	21	36	0	0	850
19		18	19	41.7%	834.5	0.0	0.0	0.0	0.0	0.0	10,850.6	0.0	18	1,113	0	69	0	0	0	0	0	0	69	816	19	0	0	584.2	18	1,113	0	69	0	0	17	36	0	0	706
20		19	20	32.9%	658.3	0.0	0.0	0.0	0.0	0.0	10,192.2	0.0	18	878	0	54	0	0	0	0	0	0	54	658	0	0	0	460.8	18	878	0	54	0	0	14	18	0	0	547
21		20	21	30.6%	612.3	0.0	0.0	0.0	0.0	0.0	9,579.9	0.0	18	816	0	51	0	0	0	0	0	0	51	612	0	0	0	428.6	18	816	0	51	0	0	13	18	0	0	510
22	Off-Peak; TES	21	22	30.5%	610.0	0.0	0.0	0.0	0.0	0.0	8,970.0	0.0	18	813	0	50	0	0	0	0	0	0	50	610	0	0	0	427.0	18	813	0	50	0	0	13	18	0	0	508
23	Charging	22	23	0.0%	0	816	816	816	0.0	0.0	11,418.0	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	13,866	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	7,721.0											10,369.7	9,398			0	7,617	432	14,036	472										9,074.4

TYPICAL DECEMBER DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES												ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	18,807.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816	377	0	0.0	0.0	20,000.0	834.9	18	1,590	39	98	0	0	33	36	0	0	1,041	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES Charging	3	4	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	6.5%	129.3	0	0	0	0.0	0.0	19,870.7	0.0	18	172	0	11	0	0	0	0	0	0	11	0	0	129	0	90.5	18	0	172	0	7	5	0	0	1	7	110
9		8	9	8.4%	168.0	0.0	0.0	0.0	0.0	0.0	19,702.7	0.0	18	224	0	14	0	0	0	0	0	0	14	0	0	168	0	117.6	18	0	224	0	7	6	0	0	2	7	139
10		9	10	14.1%	281.1	0.0	0.0	0.0	0.0	0.0	19,421.6	0.0	18	375	0	23	0	0	0	0	0	0	23	281	0	0	0	196.8	18	375	0	23	0	0	6	18	0	0	244
11		10	11	18.0%	359.9	0.0	0.0	0.0	0.0	0.0	19,061.8	0.0	18	480	0	30	0	0	0	0	0	0	30	360	0	0	0	251.9	18	480	0	30	0	0	8	18	0	0	307
12		11	12	27.0%	540.1	0.0	0.0	0.0	0.0	0.0	18,521.7	0.0	18	720	0	45	0	0	0	0	0	0	45	540	0	0	0	378.1	18	720	0	45	0	0	11	18	0	0	452
13		12	13	33.5%	670.4	0.0	0.0	0.0	0.0	0.0	17,851.3	0.0	18	894	0	55	0	0	0	0	0	0	55	670	0	0	0	469.3	18	894	0	55	0	0	14	18	0	0	556
14	Mid-Peak; TES	13	14	34.5%	689.6	0.0	0.0	0.0	0.0	0.0	17,161.6	0.0	18	920	0	57	0	0	0	0	0	0	57	690	0	0	0	482.8	18	920	0	57	0	0	14	18	0	0	572
15		14	15	41.3%	826.9	0.0	0.0	0.0	0.0	0.0	16,334.7	0.0	18	1,103	0	68	0	0	0	0	0	0	68	816	11	0	0	578.8	18	1,103	0	68	0	0	17	36	0	0	700
16		15	16	44.0%	879.7	0.0	0.0	0.0	0.0	0.0	15,455.0	0.0	18	1,173	0	73	0	0	0	0	0	0	73	816	64	0	0	615.8	18	1,173	0	73	0	0	18	36	0	0	743
17		16	17	44.7%	893.5	0.0	0.0	0.0	0.0	0.0	14,561.5	0.0	18	1,191	0	74	0	0	0	0	0	0	74	816	78	0	0	625.5	18	1,191	0	74	0	0	19	36	0	0	754
18		17	18	38.8%	775.6	0.0	0.0	0.0	0.0	0.0	13,785.9	0.0	18	1,034	0	64	0	0	0	0	0	0	64	776	0	0	0	542.9	18	1,034	0	64	0	0	16	18	0	0	641
19		18	19	32.2%	644.2	0.0	0.0	0.0	0.0	0.0	13,141.7	0.0	18	859	0	53	0	0	0	0	0	0	53	644	0	0	0	450.9	18	859	0	53	0	0	13	18	0	0	535
20		19	20	29.2%	583.4	0.0	0.0	0.0	0.0	0.0	12,558.3	0.0	18	778	0	48	0	0	0	0	0	0	48	583	0	0	0	408.4	18	778	0	48	0	0	12	18	0	0	487
21		20	21	27.4%	548.0	0.0	0.0	0.0	0.0	0.0	12,010.3	0.0	18	731	0	45	0	0	0	0	0	0	45	548	0	0	0	383.6	18	731	0	45	0	0	11	18	0	0	458
22	Off-Peak; TES	21	22	27.4%	547.0	0.0	0.0	0.0	0.0	0.0	11,463.3	0.0	18	729	0	45	0	0	0	0	0	0	45	547	0	0	0	382.9	18	729	0	45	0	0	11	18	0	0	457
23	Charging	22	23	0.0%	0	816	816	816	0.0	0.0	13,911.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	16,359	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	5,975.7											8,031.8	8,087			0	5,976	432	10,986	396							7,155.2

TYPICAL JANUARY DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES												ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @70% & 100'TDH (kW)	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	485	0.0	0.0	20,000.0	1,482.2	18	2,823	58	175	0	0	59	54	0	0	1,828	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES Charging	3	4	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	6.0%	119.1	0	0	0	0.0	0.0	19,880.9	0.0	18	159	0	10	0	0	0	0	0	0	10	0	0	119	0	83.4	18	0	159	0	7	4	0	0	1	7	103
9		8	9	7.9%	158.8	0.0	0.0	0.0	0.0	0.0	19,722.1	0.0	18	212	0	13	0	0	0	0	0	0	13	0	0	159	0	111.2	18	0	212	0	7	6	0	0	2	7	132
10		9	10	9.6%	191.3	0.0	0.0	0.0	0.0	0.0	19,530.7	0.0	18	255	0	16	0	0	0	0	0	0	16	191	0	0	0	133.9	18	255	0	16	0	0	4	18	0	0	172
11		10	11	13.4%	268.9	0.0	0.0	0.0	0.0	0.0	19,261.9	0.0	18	358	0	22	0	0	0	0	0	0	22	269	0	0	0	188.2	18	358	0	22	0	0	6	18	0	0	234
12		11	12	20.6%	412.6	0.0	0.0	0.0	0.0	0.0	18,849.3	0.0	18	550	0	34	0	0	0	0	0	0	34	413	0	0	0	288.8	18	550	0	34	0	0	9	18	0	0	349
13		12	13	26.8%	535.8	0.0	0.0	0.0	0.0	0.0	18,313.5	0.0	18	714	0	44	0	0	0	0	0	0	44	536	0	0	0	375.1	18	714	0	44	0	0	11	18	0	0	448
14	Mid-Peak; TES	13	14	27.8%	555.9	0.0	0.0	0.0	0.0	0.0	17,757.5	0.0	18	741	0	46	0	0	0	0	0	0	46	556	0	0	0	389.1	18	741	0	46	0	0	12	18	0	0	465
15		14	15	32.7%	653.0	0.0	0.0	0.0	0.0	0.0	17,104.5	0.0	18	871	0	54	0	0	0	0	0	0	54	653	0	0	0	457.1	18	871	0	54	0	0	14	18	0	0	543
16		15	16	35.1%	701.9	0.0	0.0	0.0	0.0	0.0	16,402.7	0.0	18	936	0	58	0	0	0	0	0	0	58	702	0	0	0	491.3	18	936	0	58	0	0	15	18	0	0	582
17		16	17	34.6%	691.2	0.0	0.0	0.0	0.0	0.0	15,711.5	0.0	18	922	0	57	0	0	0	0	0	0	57	691	0	0	0	483.8	18	922	0	57	0	0	14	18	0	0	573
18		17	18	32.5%	650.6	0.0	0.0	0.0	0.0	0.0	15,060.9	0.0	18	867	0	54	0	0	0	0	0	0	54	651	0	0	0	455.4	18	867	0	54	0	0	14	18	0	0	541
19		18	19	27.9%	558.3	0.0	0.0	0.0	0.0	0.0	14,502.6	0.0	18	744	0	46	0	0	0	0	0	0	46	558	0	0	0	390.8	18	744	0	46	0	0	12	18	0	0	466
20		19	20	25.6%	511.6	0.0	0.0	0.0	0.0	0.0	13,991.0	0.0	18	682	0	42	0	0	0	0	0	0	42	512	0	0	0	358.1	18	682	0	42	0	0	11	18	0	0	429
21		20	21	25.0%	499.1	0.0	0.0	0.0	0.0	0.0	13,491.9	0.0	18	666	0	41	0	0	0	0	0	0	41	499	0	0	0	349.4	18	666	0	41	0	0	10	18	0	0	419
22	Off-Peak; TES	21	22	25.3%	505	0.0	0.0	0.0	0.0	0.0	12,986.6	0.0	18	674	0	42	0	0	0	0	0	0	42	505	0	0	0	353.7	18	674	0	42	0	0	11	18	0	0	424
23	Charging	22	23	0.0%	0	816	816	816	0.0	0.0	15,434.6	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	17,883	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	4,909.4											6,597.2	6,735			0	4,909	432	8,981	371							5,878.8

TYPICAL FEBRUARY DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES												ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	19,467.2	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	533	0	0	0.0	0.0	20,000.0	373.0	18	710	19	44	0	0	15	18	0	0	469	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES Charging	3	4	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	6.6%	132.9	0	0	0	0.0	0.0	19,867.1	0.0	18	177	0	11	0	0	0	0	0	0	11	0	0	133	0	93.0	18	0	177	0	7	5	0	0	1	7	113
9		8	9	8.9%	177.1	0.0	0.0	0.0	0.0	0.0	19,690.0	0.0	18	236	0	15	0	0	0	0	0	0	15	0	0	177	0	124.0	18	0	236	0	7	6	0	0	2	7	146
10		9	10	14.1%	282.8	0.0	0.0	0.0	0.0	0.0	19,407.2	0.0	18	377	0	23	0	0	0	0	0	0	23	283	0	0	0	198.0	18	377	0	23	0	0	6	18	0	0	245
11		10	11	18.2%	364.3	0.0	0.0	0.0	0.0	0.0	19,042.8	0.0	18	486	0	30	0	0	0	0	0	0	30	364	0	0	0	255.0	18	486	0	30	0	0	8	18	0	0	311
12		11	12	27.8%	555.3	0.0	0.0	0.0	0.0	0.0	18,487.5	0.0	18	740	0	46	0	0	0	0	0	0	46	555	0	0	0	388.7	18	740	0	46	0	0	12	18	0	0	464
13		12	13	32.5%	650.4	0.0	0.0	0.0	0.0	0.0	17,837.1	0.0	18	867	0	54	0	0	0	0	0	0	54	650	0	0	0	455.3	18	867	0	54	0	0	14	18	0	0	540
14	Mid-Peak; TES	13	14	33.1%	661.9	0.0	0.0	0.0	0.0	0.0	17,175.1	0.0	18	883	0	55	0	0	0	0	0	0	55	662	0	0	0	463.3	18	883	0	55	0	0	14	18	0	0	550
15		14	15	39.0%	779.7	0.0	0.0	0.0	0.0	0.0	16,395.5	0.0	18	1,040	0	64	0	0	0	0	0	0	64	780	0	0	0	545.8	18	1,040	0	64	0	0	16	18	0	0	644
16		15	16	41.7%	834.6	0.0	0.0	0.0	0.0	0.0	15,560.8	0.0	18	1,113	0	69	0	0	0	0	0	0	69	816	19	0	0	584.2	18	1,113	0	69	0	0	17	36	0	0	706
17		16	17	42.0%	840.0	0.0	0.0	0.0	0.0	0.0	14,720.9	0.0	18	1,120	0	69	0	0	0	0	0	0	69	816	24	0	0	588.0	18	1,120	0	69	0	0	18	36	0	0	711
18		17	18	39.2%	783.1	0.0	0.0	0.0	0.0	0.0	13,937.7	0.0	18	1,044	0	65	0	0	0	0	0	0	65	783	0	0	0	548.2	18	1,044	0	65	0	0	16	18	0	0	647
19		18	19	32.7%	653.6	0.0	0.0	0.0	0.0	0.0	13,284.2	0.0	18	871	0	54	0	0	0	0	0	0	54	654	0	0	0	457.5	18	871	0	54	0	0	14	18	0	0	543
20		19	20	29.9%	598.1	0.0	0.0	0.0	0.0	0.0	12,686.1	0.0	18	797	0	49	0	0	0	0	0	0	49	598	0	0	0	418.7	18	797	0	49	0	0	12	18	0	0	498
21		20	21	28.1%	562.9	0.0	0.0	0.0	0.0	0.0	12,123.2	0.0	18	751	0	46	0	0	0	0	0	0	46	563	0	0	0	394.1	18	751	0	46	0	0	12	18	0	0	470
22	Off-Peak; TES	21	22	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	12,123.2	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	18
23	Charging	22	23	0.0%	0.0	816	816	816	0.0	0.0	14,571.2	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	17,019	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	5,513.8											7,405.4	7,524			0	5,514	432	10,089	413							6,606.5

TYPICAL MARCH DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES												ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @70% & 100'TDH (kW)	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	18,286.5	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816	816	82	0.0	0.0	20,000.0	1,199.8	18	2,285	58	141	0	0	48	54	0	0	1,501	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES Charging	3	4	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5		4	5	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	6.9%	138.8	0	0	0	0.0	0.0	19,861.2	0.0	18	185	0	11	0	0	0	0	0	0	11	0	0	139	0	97.2	18	0	185	0	7	5	0	0	1	7	117
9		8	9	9.3%	186.5	0.0	0.0	0.0	0.0	0.0	19,674.7	0.0	18	249	0	15	0	0	0	0	0	0	15	0	0	187	0	130.6	18	0	249	0	7	7	0	0	2	7	153
10		9	10	15.6%	311.1	0.0	0.0	0.0	0.0	0.0	19,363.6	0.0	18	415	0	26	0	0	0	0	0	0	26	311	0	0	0	217.7	18	415	0	26	0	0	6	18	0	0	268
11		10	11	19.4%	388.5	0.0	0.0	0.0	0.0	0.0	18,975.1	0.0	18	518	0	32	0	0	0	0	0	0	32	388	0	0	0	271.9	18	518	0	32	0	0	8	18	0	0	330
12		11	12	29.5%	589.3	0.0	0.0	0.0	0.0	0.0	18,385.9	0.0	18	786	0	49	0	0	0	0	0	0	49	589	0	0	0	412.5	18	786	0	49	0	0	12	18	0	0	491
13		12	13	35.2%	704.3	0.0	0.0	0.0	0.0	0.0	17,681.6	0.0	18	939	0	58	0	0	0	0	0	0	58	704	0	0	0	493.0	18	939	0	58	0	0	15	18	0	0	584
14	Mid-Peak; TES	13	14	35.3%	706.8	0.0	0.0	0.0	0.0	0.0	16,974.8	0.0	18	942	0	58	0	0	0	0	0	0	58	707	0	0	0	494.8	18	942	0	58	0	0	15	18	0	0	586
15		14	15	41.9%	838.6	0.0	0.0	0.0	0.0	0.0	16,136.3	0.0	18	1,118	0	69	0	0	0	0	0	0	69	816	23	0	0	587.0	18	1,118	0	69	0	0	17	36	0	0	710
16		15	16	45.3%	906.0	0.0	0.0	0.0	0.0	0.0	15,230.3	0.0	18	1,208	0	75	0	0	0	0	0	0	75	816	90	0	0	634.2	18	1,208	0	75	0	0	19	36	0	0	764
17		16	17	45.9%	917.4	0.0	0.0	0.0	0.0	0.0	14,312.8	0.0	18	1,223	0	76	0	0	0	0	0	0	76	816	101	0	0	642.2	18	1,223	0	76	0	0	19	36	0	0	773
18		17	18	42.6%	852.8	0.0	0.0	0.0	0.0	0.0	13,460.1	0.0	18	1,137	0	70	0	0	0	0	0	0	70	816	37	0	0	596.9	18	1,137	0	70	0	0	18	36	0	0	721
19		18	19	35.3%	706.3	0.0	0.0	0.0	0.0	0.0	12,753.8	0.0	18	942	0	58	0	0	0	0	0	0	58	706	0	0	0	494.4	18	942	0	58	0	0	15	18	0	0	585
20		19	20	31.7%	635.0	0.0	0.0	0.0	0.0	0.0	12,118.8	0.0	18	847	0	52	0	0	0	0	0	0	52	635	0	0	0	444.5	18	847	0	52	0	0	13	18	0	0	528
21		20	21	29.5%	591.0	0.0	0.0	0.0	0.0	0.0	11,527.9	0.0	18	788	0	49	0	0	0	0	0	0	49	591	0	0	0	413.7	18	788	0	49	0	0	12	18	0	0	493
22	Off-Peak; TES	21	22	29.3%	585.4	0.0	0.0	0.0	0.0	0.0	10,942.5	0.0	18	781	0	48	0	0	0	0	0	0	48	585	0	0	0	409.8	18	781	0	48	0	0	12	18	0	0	488
23	Charging	22	23	0.0%	0	816	816	816	0.0	0.0	13,390.5	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	15,838	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	6,340.6											8,534.5	8,481			0	6,340	432	11,643	434							7,589.9

TYPICAL APRIL DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - EXISTING CHILLER PLANT WITH TES										ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	14,794.7	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816	816	816	0.0	0.0	17,242.7	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	816	816	816	0.0	0.0	19,690.7	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES	3	4	0.0%	0	309	0	0	0.0	0.0	20,000.0	216.5	18	412	39	26	0	0	9	36	0	0	325	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5	Charging	4	5	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	7.4%	148.0	0	0	0	0.0	0.0	19,852.0	0.0	18	197	0	12	0	0	0	0	0	0	12	0	0	148	0	103.6	18	0	197	0	7	5	0	0	2	7	124
9		8	9	10.2%	204.8	0.0	0.0	0.0	0.0	0.0	19,647.2	0.0	18	273	0	17	0	0	0	0	0	0	17	0	0	205	0	143.4	18	0	273	0	7	7	0	0	2	7	167
10		9	10	21.8%	436.7	0.0	0.0	0.0	0.0	0.0	19,210.5	0.0	18	582	0	36	0	0	0	0	0	0	36	437	0	0	0	305.7	18	582	0	36	0	0	9	18	0	0	369
11		10	11	28.4%	568.1	0.0	0.0	0.0	0.0	0.0	18,642.3	0.0	18	758	0	47	0	0	0	0	0	0	47	568	0	0	0	397.7	18	758	0	47	0	0	12	18	0	0	474
12		11	12	36.4%	728.4	0.0	0.0	0.0	0.0	0.0	17,913.9	0.0	18	971	0	60	0	0	0	0	0	0	60	728	0	0	0	509.9	18	971	0	60	0	0	15	18	0	0	603
13		12	13	42.6%	852.6	0.0	0.0	0.0	0.0	0.0	17,061.3	0.0	18	1,137	0	70	0	0	0	0	0	0	70	816	37	0	0	596.8	18	1,137	0	70	0	0	18	36	0	0	721
14	Mid-Peak; TES	13	14	43.8%	877.0	0.0	0.0	0.0	0.0	0.0	16,184.3	0.0	18	1,169	0	72	0	0	0	0	0	0	72	816	61	0	0	613.9	18	1,169	0	72	0	0	18	36	0	0	740
15		14	15	51.2%	1,024.9	0.0	0.0	0.0	0.0	0.0	15,159.4	0.0	18	1,367	0	85	0	0	0	0	0	0	85	816	209	0	0	717.5	18	1,367	0	85	0	0	21	36	0	0	859
16		15	16	57.5%	1,150.5	0.0	0.0	0.0	0.0	0.0	14,008.9	0.0	18	1,534	0	95	0	0	0	0	0	0	95	816	335	0	0	805.4	18	1,534	0	95	0	0	24	36	0	0	960
17		16	17	97.3%	1,946.6	0.0	0.0	0.0	0.0	0.0	12,062.2	0.0	18	2,596	0	161	0	0	0	0	0	0	161	816	816	315	0	1,362.6	18	2,176	420	135	7	11	41	36	20	7	1,619
18		17	18	82.5%	1,650.3	0.0	0.0	0.0	0.0	0.0	10,412.0	0.0	18	2,200	0	136	0	0	0	0	0	0	136	816	816	18	0	1,155.2	18	2,176	24	135	7	1	34	36	17	7	1,392
19		18	19	45.1%	902.7	0.0	0.0	0.0	0.0	0.0	9,509.3	0.0	18	1,204	0	74	0	0	0	0	0	0	74	816	87	0	0	631.9	18	1,204	0	74	0	0	19	36	0	0	761
20		19	20	36.4%	727.7	0.0	0.0	0.0	0.0	0.0	8,781.6	0.0	18	970	0	60	0	0	0	0	0	0	60	728	0	0	0	509.4	18	970	0	60	0	0	15	18	0	0	603
21		20	21	33.5%	669.9	0.0	0.0	0.0	0.0	0.0	8,111.7	0.0	18	893	0	55	0	0	0	0	0	0	55	670	0	0	0	468.9	18	893	0	55	0	0	14	18	0	0	556
22	Off-Peak; TES	21	22	33.0%	661.0	0.0	0.0	0.0	0.0	0.0	7,450.7	0.0	18	881	0	55	0	0	0	0	0	0	55	661	0	0	0	462.7	18	881	0	55	0	0	14	18	0	0	549
23	Charging	22	23	0.0%	0	816	816	816	0.0	0.0	9,898.7	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	12,347	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	8,784.5											11,838.0				8,784		15,818	914							10,496.7

TYPICAL MAY DAY COLLEGE LOAD PROFILE						Chillers					ALTERNATIVE #1 - CHILLER PLANT WITH TES										ALTERNATIVE #2 - EXISTING CHILLER PLANT												
Line No.	Mode	Start Time	End Time	Percent Existing Plant Load	Load (tons)	CH-2 (750-tons)	CH-3 (750 Tons)	CH-4 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	TES Stored Capacity	Water-Cooled Chiller kW	CHW ΔT	CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 40' TDH (kW)	Central plant secondary CHW Pump Power @70% & 230'TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	TES kW Demand	CH-2 (750-tons)	CH-3 (750 Tons)	CH-1 (250-tons)	CH-2 (250-tons)	Water Cooled Chiller kW	Avg.CHW ΔT	Central plant CHW Flow (GPM)	Bldg. 2 CHW Flow (GPM)	Central plant Primary CHW Pump Power @70% & 230' TDH (kW)	Building 2 Primary CHW Pump Power @70% &65'TDH (kW)	Building 2 Secondary CHW Pump Power @70% & 100'TDH (kW)	Central Plant CW Pump Power @ 2.4GPM/ton, 30'TDH & 65%	Central Plant CT Fan kW 40Hp each & .60 Duty Factor	Bldg. 2 CW Pump Power @ 2.4GPM/ton, 15'TDH & 65%	Bldg. 2 CT Fan kW 15 Hp each & .60 Duty Factor	Existing C entral Plant kW Demand
1		0	1	0.0%	0	816	816	816	0.0	0.0	11,702.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
2		1	2	0.0%	0	816	816	816	0.0	0.0	14,150.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
3		2	3	0.0%	0	816	816	816	0.0	0.0	16,598.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
4	Off-Peak; TES	3	4	0.0%	0	816	816	816	0.0	0.0	19,046.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
5	Charging	4	5	0.0%	0	816	138	0	0.0	0.0	20,000.0	667.6	18	1,272	39	79	0	0	27	36	0	0	847	0	0	0	0	0.0	18	0	0	0	0	6	0	0	0	0	0
6		5	6	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
7		6	7	0.0%	0	0	0	0	0.0	0.0	20,000.0	0.0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
8		7	8	10.0%	200.4	0	0	0	0.0	0.0	19,799.6	17	0.0	18	267	0	17	0	0	0	0	0	0	17	0	0	200	0	140.3	18	0	267	0	7	7	0	0	2	7	163
9		8	9	15.2%	304.1	0.0	0.0	0.0	0.0	0.0	19,495.5	0.0	18	405	0	25	0	0	0	0	0	0	25	0	0	250	54	212.8	18	0	405	0	14	11	0	0	3	13	254
10		9	10	44.4%	888.2	0.0	0.0	0.0	0.0	0.0	18,607.3	0.0	18	1,184	0	73	0	0	0	0	0	0	73	816	72	0	0	621.7	18	1,184	0	73	0	0	19	18	0	0	731
11		10	11	53.6%	1,071.3	0.0	0.0	0.0	0.0	0.0	17,536.0	0.0	18	1,428	0	88	0	0	0	0	0	0	88	816	255	0	0	749.9	18	1,428	0	88	0	0	22	18	0	0	879
12		11	12	58.7%	1,174.9	0.0	0.0	0.0	0.0	0.0	16,361.1	0.0	18	1,567	0	97	0	0	0	0	0	0	97	816	359	0	0	822.4	18	1,567	0	97	0	0	25	18	0	0	962
13		12	13	65.6%	1,312.3	0.0	0.0	0.0	0.0	0.0	15,048.8	0.0	18	1,750	0	108	0	0	0	0	0	0	108	816	496	0	0	918.6	18	1,750	0	108	0	0	27	36	0	0	1,090
14	Mid-Peak; TES	13	14	67.6%	1,351.9	0.0	0.0	0.0	0.0	0.0	13,696.9	0.0	18	1,803	0	112	0	0	0	0	0	0	112	816	536	0	0	946.3	18	1,803	0	112	0	0	28	36	0	0	1,122
15		14	15	72.1%	1,442.7	0.0	0.0	0.0	0.0	0.0	12,254.2	0.0	18	1,924	0	119	0	0	0	0	0	0	119	816	627	0	0	1,009.9	18	1,924	0	119	0	0	30	36	0	0	1,195
16		15	16	75.3%	1,505.3	0.0	0.0	0.0	0.0	0.0	10,748.9	0.0	18	2,007	0	124	0	0	0	0	0	0	124	816	689	0	0	1,053.7	18	2,007	0	124	0	0	31	36	0	0	1,245
17		16	17	75.6%	1,511.7	0.0	0.0	0.0	0.0	0.0	9,237.2	0.0	18	2,016	0	125	0	0	0	0	0	0	125	816	696	0	0	1,058.2	18	2,016	0	125	0	0	32	36	0	0	1,250
18		17	18	67.9%	1,358.1	0.0	0.0	0.0	0.0	0.0	7,879.0	0.0	18	1,811	0	112	0	0	0	0	0	0	112	816	542	0	0	950.7	18	1,811	0	112	0	0	28	36	0	0	1,127
19		18	19	57.6%	1,151.7	0.0	0.0	0.0	0.0	0.0	6,727.3	0.0	18	1,536	0	95	0	0	0	0	0	0	95	816	336	0	0	806.2	18	1,536	0	95	0	0	24	36	0	0	961
20		19	20	42.8%	855.3	0.0	0.0	0.0	0.0	0.0	5,872.0	0.0	18	1,140	0	71	0	0	0	0	0	0	71	816	39	0	0	598.7	18	1,140	0	71	0	0	18	18	0	0	705
21		20	21	38.0%	760.9	0.0	0.0	0.0	0.0	0.0	5,111.0	0.0	18	1,015	0	63	0	0	0	0	0	0	63	761	0	0	0	532.7	18	1,015	0	63	0	0	16	18	0	0	629
22	Off-Peak; TES	21	22	37.6%	752.8	0.0	0.0	0.0	0.0	0.0	4,358.3	0.0	18	1,004	0	62	0	0	0	0	0	0	62	753	0	0	0	526.9	18	1,004	0	62	0	0	16	18	0	0	623
23	Charging	22	23	0.0%	0	816	816	816	0.0	0.0	6,806.3	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
24		23	24	0.0%	0	816	816	816	0	0	9,254	1,713.6	18	3,264	58	202	0	0	68	54	0	0	2,096	0	0	0	0	0.0	18	0	0	0	0	0	0	0	0	0	0
											total kW-Hr	10,949.2											14,710.8																12,936.6

Typical Summer Chillers with TES Tank (88 days of Operation)							Typical Summer Existing Chillers (88 Days of Operation)						
Start Time	End Time	Cooling kW Demand	Delivery Service	Generation Charges	Total $/kWh	Consumption Charge	Start Time	End Time	Cooling kW Demand	Delivery Service	Generation Charges	Total $/kWh	Consumption Charge
0	1	184,404	0.01889	0.03950	0.05839	$10,767.37	0	1	0	0.06600	0.07670	0.14270	$0.00
1	2	184,404	0.01889	0.03950	0.05839	$10,767.37	1	2	0	0.06600	0.07670	0.14270	$0.00
2	3	184,404	0.01889	0.03950	0.05839	$10,767.37	2	3	0	0.06600	0.07670	0.14270	$0.00
3	4	164,656	0.01889	0.03950	0.05839	$9,614.27	3	4	0	0.06600	0.07670	0.14270	$0.00
4	5	0	0.01889	0.03950	0.05839	$0.00	4	5	0	0.06600	0.07670	0.14270	$0.00
5	6	0	0.01889	0.03950	0.05839	$0.00	5	6	0	0.06600	0.07670	0.14270	$0.00
6	7	27,371	0.01889	0.03950	0.05839	$1,598.20	6	7	30,992	0.06600	0.07670	0.14270	$4,422.49
7	8	41,720	0.01889	0.06483	0.08372	$3,492.77	7	8	48,702	0.06600	0.07670	0.14270	$6,949.73
8	9	103,349	0.01889	0.06483	0.08372	$8,652.36	8	9	121,574	0.06600	0.07670	0.14270	$17,348.60
9	10	106,982	0.01889	0.06483	0.08372	$8,956.55	9	10	125,266	0.06600	0.07670	0.14270	$17,875.53
10	11	13,335	0.01889	0.06483	0.08372	$1,116.43	10	11	135,554	0.06600	0.07670	0.14270	$19,343.59
11	12	14,424	0.01889	0.06483	0.08372	$1,207.61	11	12	146,529	0.06600	0.07670	0.14270	$20,909.64
12	13	14,882	0.01889	0.08629	0.10518	$1,565.31	12	13	148,806	0.06600	0.07670	0.14270	$21,234.64
13	14	15,593	0.01889	0.08629	0.10518	$1,640.04	13	14	151,821	0.06600	0.07670	0.14270	$21,664.82
14	15	16,020	0.01889	0.08629	0.10518	$1,684.96	14	15	154,104	0.06600	0.07670	0.14270	$21,990.67
15	16	16,149	0.01889	0.08629	0.10518	$1,698.51	15	16	154,561	0.06600	0.07670	0.14270	$22,055.84
16	17	14,887	0.01889	0.08629	0.10518	$1,565.80	16	17	150,418	0.06600	0.07670	0.14270	$21,464.71
17	18	12,211	0.01889	0.08629	0.10518	$1,284.31	17	18	122,501	0.06600	0.07670	0.14270	$17,480.84
18	19	8,881	0.01889	0.06483	0.08372	$743.51	18	19	89,636	0.06600	0.07670	0.14270	$12,791.07
19	20	7,914	0.01889	0.06483	0.08372	$662.58	19	20	77,989	0.06600	0.07670	0.14270	$11,129.04
20	21	0	0.01889	0.06483	0.08372	$0.00	20	21	75,361	0.06600	0.07670	0.14270	$10,753.95
21	22	184,404	0.01889	0.06483	0.08372	$15,438.33	21	22	0	0.06600	0.07670	0.14270	$0.00
22	23	184,404	0.01889	0.06483	0.08372	$15,438.33	22	23	0	0.06600	0.07670	0.14270	$0.00
23	24	180,875	0.01889	0.03950	0.05839	$10,561.27	23	24	0	0.06600	0.07670	0.14270	$0.00
		1,681,270				$119,223.26			1,733,813				$247,415.17
	on	89,741			on	$ 9,438.94		on	882,211			on	$ 125,891.52
	mid	665,414			mid	$ 55,708.46		mid	820,611			mid	$ 117,101.16
	off	926,115			off	$ 54,075.86		off	30,992			off	$ 4,422.49

	Peak Demand (kW)	Fac Demand/kW	Fac. Rel Demand Charge	Peak Demand Summer (August 3pm)		Mid Peak Demand Summer (July 11am)		
$119,223.26	191	$12.31	$2,347.34	$18.63	$3,552.47	176	$5.22	$917.93
$247,415.17	1,786	$13.71	$24,488.19	$13.71	$24,488.19	1,780	$13.71	$24,406.75

Typical Winter Chillers with TES Tank (176 days in Operation)							Typical Winter Existing Chillers (176 days in Operation)						
Start Time	End Time	Cooling kW Demand	Delivery Service	Generation Charges	Total $/kWh	Consumption Charge	Start Time	End Time	Cooling kW Demand	Delivery Service	Generation Charges	Total $/kWh	Consumption Charge
0	1	362,915	0.01889	0.03542	0.05431	$19,709.92	0	1	0	0.06600	0.07670	0.14270	$0.00
1	2	250,642	0.01889	0.03542	0.05431	$13,612.38	1	2	0	0.06600	0.07670	0.14270	$0.00
2	3	162,014	0.01889	0.03542	0.05431	$8,798.97	2	3	0	0.06600	0.07670	0.14270	$0.00
3	4	99,356	0.01889	0.03542	0.05431	$5,396.03	3	4	0	0.06600	0.07670	0.14270	$0.00
4	5	52,739	0.01889	0.03542	0.05431	$2,864.25	4	5	0	0.06600	0.07670	0.14270	$0.00
5	6	0	0.01889	0.03542	0.05431	$0.00	5	6	0	0.06600	0.07670	0.14270	$0.00
6	7	0	0.01889	0.03542	0.05431	$0.00	6	7	0	0.06600	0.07670	0.14270	$0.00
7	8	2,457	0.01889	0.03542	0.05431	$133.45	7	8	24,944	0.06600	0.07670	0.14270	$3,559.47
8	9	3,437	0.01889	0.05956	0.07845	$269.63	8	9	34,109	0.06600	0.07670	0.14270	$4,867.32
9	10	6,816	0.01889	0.05956	0.07845	$534.75	9	10	69,926	0.06600	0.07670	0.14270	$9,978.49
10	11	8,305	0.01889	0.05956	0.07845	$651.50	10	11	84,419	0.06600	0.07670	0.14270	$12,046.53
11	12	10,757	0.01889	0.05956	0.07845	$843.89	11	12	108,300	0.06600	0.07670	0.14270	$15,454.41
12	13	12,538	0.01889	0.05956	0.07845	$983.63	12	13	125,198	0.06600	0.07670	0.14270	$17,865.75
13	14	12,848	0.01889	0.05956	0.07845	$1,007.96	13	14	128,131	0.06600	0.07670	0.14270	$18,284.27
14	15	14,691	0.01889	0.05956	0.07845	$1,152.50	14	15	148,580	0.06600	0.07670	0.14270	$21,202.31
15	16	15,975	0.01889	0.05956	0.07845	$1,253.25	15	16	162,118	0.06600	0.07670	0.14270	$23,134.26
16	17	17,628	0.01889	0.05956	0.07845	$1,382.93	16	17	178,598	0.06600	0.07670	0.14270	$25,485.89
17	18	15,618	0.01889	0.05956	0.07845	$1,225.24	17	18	157,876	0.06600	0.07670	0.14270	$22,528.96
18	19	12,073	0.01889	0.05956	0.07845	$947.14	18	19	122,300	0.06600	0.07670	0.14270	$17,452.20
19	20	9,799	0.01889	0.05956	0.07845	$768.75	19	20	98,973	0.06600	0.07670	0.14270	$14,123.47
20	21	9,069	0.01889	0.05956	0.07845	$711.46	20	21	91,468	0.06600	0.07670	0.14270	$13,052.45
21	22	8,007	0.01889	0.03542	0.05431	$434.84	21	22	81,123	0.06600	0.07670	0.14270	$11,576.19
22	23	368,809	0.01889	0.03542	0.05431	$20,030.00	22	23	0	0.06600	0.07670	0.14270	$0.00
23	24	368,809	0.01889	0.03542	0.05431	$20,030.00	23	24	0	0.06600	0.07670	0.14270	$0.00
		1,825,303				$102,742.45			1,616,061				$230,611.96
	mid	149,555			mid	$ 11,732.60		mid	1,509,995			mid	$ 215,476.30
	off	1,675,748			off	$ 91,009.85		off	106,066			off	$ 15,135.66

$875 Incentive per kW
2,311 Tonnage Offset
$1,415,487.50 Incentive

$127,869.51 Winter Cost Savings
$128,191.92 Summer Cost Savings
$66,565.40 Summer KW Savings
$322,626.82 Total Annual Savings

Appendix E - Probable Construction Cost Estimate

MT SAN ANTONIO COLLEGE TES ADDITION PROJECT			
Description of Item	**Qty**	**Unit Cost**	**Total Cost**
Thermal Energy Storage System	**1**	**$3,300,000**	**$3,300,000**
750 Ton Chiller	**1**	**$310,000**	**$310,000**
750 Ton Cooling Tower	**1**	**$400,000**	**$400,000**
Underground Chilled Water Piping	**800**	**$550**	**$440,000**
Inside Plant Chilled Water Piping	**L.S.**	**$100,000**	**$100,000**
Pumps and Accessories	**L.S.**	**$200,000**	**$200,000**
Controls	**L.S.**	**$250,000**	**$250,000**
Electrical Connections	**L.S.**	**$120,000**	**$120,000**
Structural inside plant	**L.S.**	**$65,000**	**$65,000**
Allowances DSA	**L.S.**	**$50,000**	**$50,000**
Total Costs			**$5,235,000**