Mechanical Technical Report 2

Building Plant and Energy Analysis Report

The Hearst Tower
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New York, NY 10019

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1.0 Executive Summary

The 42-story Hearst Tower rises from Midtown Manhattan and stakes its claim in the New York City skyline with its eclectic diagrid design. Further inspection of the building as a system, and not just an architectural icon, reveals a building striving for excellence not only in structural innovation, but in "green" design as well.

This report will investigate the building plant and energy performance and determine what impact this performance has on factors such as LEED certification, annual energy cost, and annual building emissions. In addition to these factors, this report looks at how the mechanical system contributes to first costs and loss of rentable space.

Upon completion of building performance calculations, it was found that although the tower utilizes a curtain wall system, it is in compliance with ASHRAE STD 90.1-2004. Ultimately, the building is able to save energy even though more than 90% of the envelope is glass. In addition to analyzing performance of building envelope, the lighting system was also addressed. After performing the appropriate calculations, it was determined that the kitchen and stairways did not comply with ASHRAE Std. 90.1-2004. However, these spaces were very close to compliance and all other spaces analyzed comply. Since the building was designed to be LEED certified it is possible that this noncompliance is the result of using assumed/preliminary information.

In its entirety, the Hearst Tower claims 856,000 SF of floor area, however only 598,142 SF are rentable. Approximately 35400 SF is lost due to the mechanical system. Therefore about 14% of the lost rentable space or about 4% of the total building area is attributed entirely to the mechanical system. Since Hearst is such a large building, operating the building is costly. It was determined that the annual cost to operate the Hearst Tower is approximately $3,030.000.00. Overall, HVAC equipment accounted for about 40% of the annual operating cost while the lighting system accounted for the other 60%.

Although the tower is very large and a "cookbook" method of design, similar to those used for most high-rise buildings could have been used, the Hearst Corporation sought to make a commitment to both its employees and the environment. In a preliminary report done by the design team (April 2004), the Hearst Tower had secured 37 LEED points with the possibility of obtaining an additional 6 points. Even without the additional 6 points, the Hearst Tower has earned enough points qualify as a LEED Silver Building. Ultimately, the Hearst Tower will achieve LEED Gold Certification and earn the title of being the first such building in NYC.

2.0 LEED Rating

The Leadership in Energy and Environmental Design Green Building Rating System, LEED, is a rating system used in the design, construction, and certification of environmentally friendly buildings. Implementing the standards set forth in this system will allow owners to have a positive impact on the environment while saving on building operating costs and improving employee productivity.

The Hearst Corporation has been a part of the Columbus Circle community in New York City for more than eighty years. For their new headquarters, the Hearst Corporation not only chose to preserve their landmark façade, they aimed to construct the first LEED Gold certified building in New York City. Achieving such a status would be achieved by addressing several design issues. From the initial decision to reuse the landmark building, approximately 85% of the original structure was included the new headquarters. Also, by utilizing the diagrid, or diagonal grid pattern, Hearst eliminated the need for horizontal beams and saved about 2,000 tons of steel.

In addition to the structural ingenuity, the diagrid pattern allows the tower to utilize daylighting. In order to maximize this utilization, a control system was installed to monitor the amount of artificial light needed on each floor. Motion sensor technology will also be used to shut ff computers and lights in areas not being used. Hearst also took basic steps to environmental friendliness, such as using low vapor paints and furniture installed in the tower will be formaldehyde free.

An important part of the Hearts green design is the reuse of rainwater as makeup for air conditioning and irrigation systems. Two-14,000 gallon reclamation tanks will hold collected water that will be distributed as needed. This water will also serve the “Ice Falls” water feature located in the ground level lobby. This sustainable feature is thought to be the largest in the nation.

In a preliminary report done by the design team (April 2004), the Hearst Tower had secured 37 LEED points with the possibility of obtaining an additional 6 points. Even without the additional 6 points, the Hearst Tower has earned enough points qualify as a LEED Silver Building. A summary of how each point was achieved follows in Appendix A.

3.0 Building Envelope Compliance to ASHRAE Std. 90.1-2004

ASHRAE Std. 90.1-2004 establishes minimum requirements for the design of energy efficient buildings. Section 5 of the Standard applies specifically to the building envelope and will be used to guide the following calculations.

Located in the midtown Manhattan, the Hearst Tower falls into climatic zone 4A according to Table B-1 and is considered a nonresidential conditioned space. Using Table D-1, for New York City Central Park: HDD65 = 4805 and CDD50 =3634.

Since the Hearst Tower has two very different types of construction, a glass curtain wall tower and a precast limestone block base (Landmark portion), two different methods in Section 5 of the standard were used to check envelope compliance. The Prescriptive Building Envelope Option was used to determine compliance of the Landmark portion since the vertical fenestration area is approximately 16% of the gross wall area, which is less than the 50% maximum required to use this method. A summary of the wall and window compliance is shown below in Table 1.

Table 1: **Compliance Summary**

LANDMARK WALL ASSEMBLY

MATERIAL	THICKNESS (IN)	R-VALUE
INSIDE SURFACE RESISTANCE		0.685
GYPSUM WALL BOARD	0.625	0.56
RIGID INSULATION	2	14
AIRSPACE	0.5	0.91
PRECAST LIMESTONE	12.25	1.11
OUTSIDE SURFACE RESISTANCE		0.333
OVERALL	**15.4**	**17.6**
REQUIRED BY 90.1		**13**

WINDOW COMPLIANCE

	U-VALUE (MAX)	SHGC
REQUIRED	0.57	0.39
INSTALLED	0.22	0.2494

The tower portion of the building is approximately 90%+ glass, and therefore the Building Trade-Off Option was utilized to check envelope compliance. This method requires solving a series of equations in which the result yields the *envelope performance factor (EPF)*. The EPF "approximates the total heating and cooling energy associated with a single square foot of surface (ASHRAE STD 90.1-2001)." As an alternative to solving these comprehensive equations, the EnvStd computing program that accompanies STD 90.1-2001 was used to perform the calculations.

When using the Trade-Off Option, the U-factor, SHGC, and visible light transmittance (VLT), for all windows are specified. The VLT factor is used by the program to determine a daylighting potential term. Buildings that specify a high VLT glazing will benefit from the daylighting potential factor, while those with a low VLT will be penalized. In the case of the Hearst Tower, a VLT of approximately 0.6 was used in conjunction with a daylighting controls system.

To check the envelope of the tower using EnvStd, one typical floor space was analyzed. The assumptions used were:

- **Typical floor**: 20,000 SF
- **Typical floor height**: 13.5 FT
- **Typical wall area**: (13.5 FT * 200 FT) = 2700 SF (for each exposure)
- **Wall area**: 100% glazing

Appendix B contains the summary report for the input values and results of the EnvStd calculations. Upon completion of these calculations, it was found that the tower curtain wall is in compliance with STD 90.1. Ultimately, the building is able to save energy even though more than 90% of the envelope is glass.

4.0 Lighting System Compliance to Std. 90.1-2004

In addition to providing performance standards for the building envelope, ASHRAE Std.90.1 also specifies lighting power density requirements. These requirements can be determined by using one of two methods: the Building Area Method or the Space by Space Method. The Building Area Method is a simplified compliance check in which the interior lighting wattage is added up and divided by the total building area. This value must be less than the value in Table 9.5.1 corresponding to the building type. The Space by Space Method compares the allowable wattage for each space type, as described in Table 9.6.1, to the wattage of the lighting in that particular space. Since limited information was available on the lighting fixtures, five typical spaces, for which fixture information was known, were analyzed. A summary of the compliance results is provided in the table below:

Table 2: **Lighting Density Compliance Check**

Typical Space	Area (SF)	Fixture	Quantity	Watts/Fixture	Total Watts	Std 90.1 W/SF	Allowed Watts	Compliance?
Elevator Lobby	494	Recessed Fluorescent-ceiling mounted	8	36	288	1.3	642.2	yes
Restrooms	170	Linear Fluorescent-surface ceiling/wall mounted	2	67	134	0.9	153	yes
Stairs-active	200	Fluorescent Fixture-wall mounted	2	67	134	0.6	120	no**
Test Kitchen	3110	Recessed Fluorescent-ceiling mounted	53	85	4505	1.2*	3732	no
Mechanical Room	12880	surface mounted metal halide	44	295	12980	1.5	19320	yes

***** space approximated as being food preparation

**may comply since area was estimated

After performing the appropriate calculations, it was determined that areas such as stairwells and the test kitchens did not comply with ASHRAE Std. 90.1. However, these spaces were very close to compliance. Since the building is to be LEED Gold Certified and special attention, such as the integration of a daylighting control system, was given to lighting power usage, this noncompliance may be a result of having limited information. To determine a more accurate model of the power usage using the Space by Space Method, additional spaces will be considered when the information becomes available.

5.0 Mechanical System Cost and Lost Rentable Space

With the aide of documents provided by the mechanical engineer, Flack+Kurtz of New York City, the total HVAC system cost and cost per square foot was determined. A table of these conclusions is included below.

Table 3: **Mechanical System Hard Costs**

	RAISED FLOOR LOCAL FANS	*CENTRAL FAN STD TEMP*	*CENTRAL FAN LOW TEMP*	*FCU W/ PER FRESH AIR*	*CENTRAL FAN STD AIR W / RAISED FLOOR*
TOTAL HVAC SYSTEM COST (INCL M/U)	33705533.58	34159445.19	32239279.63	38781024.43	33183446.96
TOTAL HVAC COST / SF (BASE & TENANT)	39.65	40.19	37.93	45.62	39.04

According to documents supplied by the Hearst Tower design team, the building contains approximately 598,142 carpetable square feet. This area is usable square footage minus any areas that are devoted to support, i.e. the amount that could be used for workspace. A break down of the building floors and corresponding areas is given in Figure 1.

With an overall floor area of 856,000 SF, approximately 257,858 SF of space are lost to building systems and unplannable areas such as closets, restrooms, etc. The focus of this section will be the amount of rentable space lost due specifically to the mechanical system.

The Hearst Tower contains five floors which are either dedicated mechanical spaces or floors containing mechanical equipment. A breakdown of the mechanical square footage is shown in Table 3. Approximately 35400 SF is lost due to the mechanical system, which includes MER space, plenum space, and shaft space. Therefore about 14% of the lost rentable space or about 4% of the total building area is attributed entirely to the mechanical system.

	CSF*/Floor				
		42a	MECH	*	
		42	MECH	*	
	16,684	41		*	Boardroom, Dining, Conference
	16,784	40		*	Executive
	16,721	39		*	Executive
	16,509	38		*	Corporate
	16,213	37		*	Corporate
	15,817	36		*	Argyle (40)
	16,074	35	VACANT	*	
	16,393	34	VACANT	*	
	16,589	33		*	Magazine
	16,689	32		*	Magazine
	16,626	31		*	Magazine
	16,430	30		*	Magazine
	15,594	29		*	Magazine
		28b		*	Mechanical
		28a		*	Mechanical
	15,081	28	*	*	GH Institute, Labs and Test Kitchens
	15,907	27	*		Magazine
	16,007	26	*		Magazine
	15,944	25	*		Magazine
	15,748	24	*		Magazine
	15,452	23	*		Magazine
	15,085	22	*		Magazine
	15,398	21	*		Magazine
	15,734	20	*		Magazine
	15,953	19	*		Magazine
	16,053	18	*		Magazine
	16,015	17	*		Magazine
	15,819	16	*		Magazine
	15,523	15	*		Magazine
	15,144	14	*		Magazine Corporate
	15,456	13	*		Fitness and Wellness Center, Corporate
	15,776	12	*		Magazines General
	16,023	11	*		Magazines General
	16,168	10	*		IS Group/Technology, Data Center
subtotal	511,409	9	MECH *		
		8			
		7			
		6			
		5			
	7,239	4			
	24,478	3	*	*	Lobby, Cafeteria
	19,318	2	*	*	Support
	22,991	Ground Floor	*	*	Security Desk, Loading dock
	12,707	Basement	*	*	Storage and support
subtotal	86,733				
TOTAL	598,142	*CSF = Carpetable square feet			

Table 4: **Mechanical Space Square Footage**		
Space Description	**Location**	**Area (SF)**
Mechanical Plant	Basement	12880
Mechanical Plant	Basement	780
Return Air Plenum Room	28 A	1280
Mechanical Plant Room	28 A	11430
Return Air Fan Room	28 A	1312
Return Air Fan Room	28 A	383
Mechanical Mezzanine	9	2480
Intake Air Plenum	9	1580
Supply Duct	10	10
Supply Duct	11	10
Supply Duct	12	24
Supply Duct	13	32
Supply Duct	14	32
Supply Riser	15	51
Supply Riser	16	60
Supply Riser	17	60
Supply Riser	18	60
Supply Riser	19	66
Supply Riser	20	66
Supply Riser	21	66
Supply Riser	22	36
Supply Riser	22	68
Supply Riser	23	36
Supply Riser	23	68
Supply Riser	24	45
Supply Riser	24	65
Supply Riser	25	60
Supply Riser	25	65
Supply Riser	26	60
Supply Riser	26	65
Supply Riser	27	60
Supply Riser	27	65
Supply Riser (2)	29	194
Return air free space	29	120
Supply Riser	30	97
Return air free space	30	120
Supply Riser	31	90
Return air free space	31	120
Supply Riser	32	81
Return air free space	32	120
Supply Riser	33	75
Return air free space	33	120
Supply Riser	34	76
Return air free space	34	120
Supply Riser	35	70
Return air free space	35	107
Supply Riser	36	52
Return air free space	36	94
Supply Riser	37	44
Return air free space	37	80
Supply Riser	38	37
Return air free space	38	67
Supply Riser	39	29
Return air free space	39	54
Supply Riser	40	22
Return air free space	40	40
Supply Riser	41	15
Return air free space	41	27
Total		**35426**

6.0 Annual Operating and Energy Cost

In order to model the performance of the Hearst Tower, Carrier's Hourly Analysis Program (HAP) was used to estimate the design load. Since the Hearst Tower is so large, areas such as elevator machine rooms, stairways, and storage areas in the basement were not considered, resulting in a total conditioned area of 538,268 SF. This area is serviced by 12 air handling/conditioning units. A summary of the units and corresponding loads, as estimated by HAP, are given below. A complete HAP report containing Air System Sizing, Air System Sizing, and Zone Sizing Summaries for each air handling unit are included in Appendix C.

Table 5: **HAP Load Estimates**

UNIT	LOAD (TONS)
AHU-B-1,2,3	62.1
AC-2-7,8	11.5
AHU-4-2	4.2
AHU-28-1,2,3,4	1089.4
AC-G-1	44.7
AHU-4-1	15.1
Totals	1227

The chiller plants and air handling units in the Hearst Tower are powered by electricity. Since the building is so large, the electricity demand is very high. Electricity for the Tower is purchased from the Consolidated Edison Company (Con Ed) at a flat rate of $0.12/kWh. In addition to this flat rate, delivery charges, market price charges, and taxes are incurred. Because these numbers are difficult to obtain, it was estimated (with the guidance of industry professionals) that the total electric rate is $0.20/kWh. With this value entered into HAP, a building simulation report was generated to estimate annual operating costs for both the HVAC and Non-HVAC systems.

Overall, HVAC equipment accounted for about 40% of the annual operating cost while the lighting system accounted for the other 60%. These results show that there is no annual heating cost. In a building this size it is not unusual to have a lower heating cost since the building experiences a very large lighting and occupancy load at all times of day throughout the year, i.e. cooling the building in the winter months may still be necessary. However this "zero cost" result in HAP results because information on the steam purchased from the Con Ed grid was not available at the time of this report. A table of specific system components and corresponding annual costs is shown on the following page. It was ultimately determined that the annual cost to operate the Hearst Tower is approximately $3,030.000.00. Appendix D contains the full HAP report regarding annual energy costs.

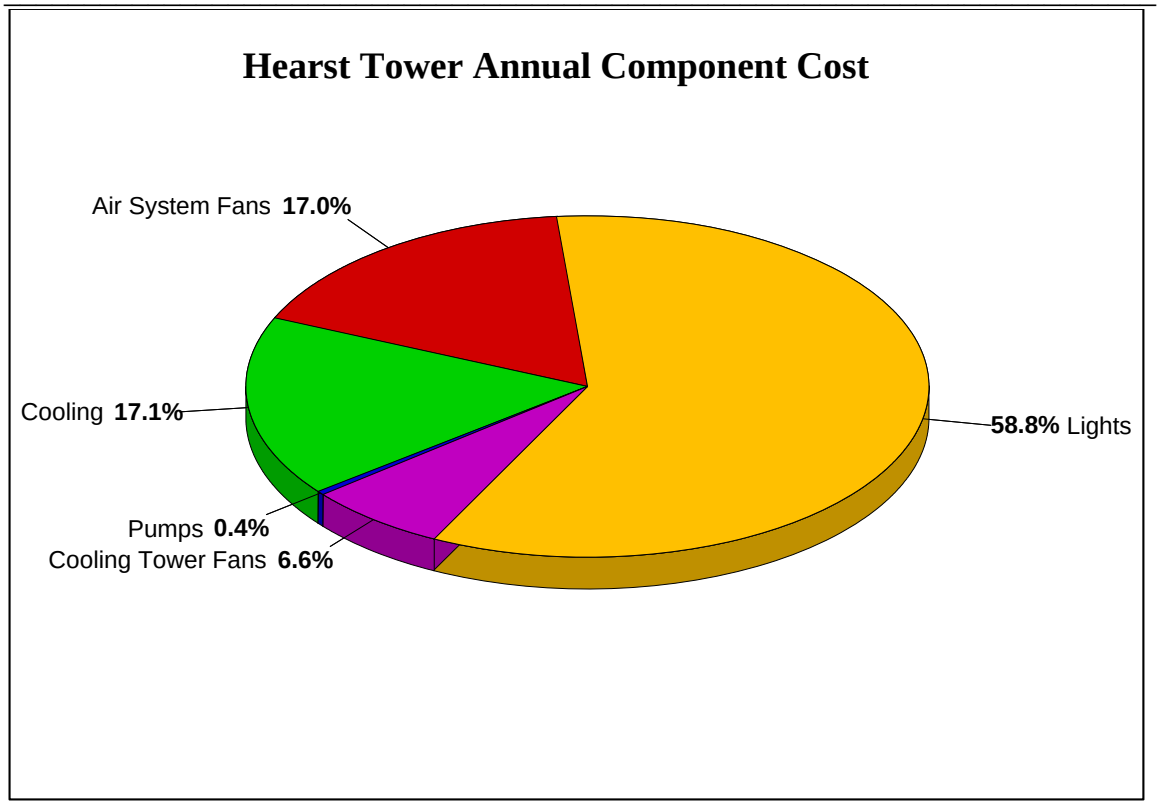

Table 6: Annual Costs

Component	Annual Cost ($)	($/ft²)	Percent of Total (%)
Air System Fans	515,890	0.958	17.0
Cooling	518,578	0.963	17.1
Heating	0	0.000	0.0
Pumps	11,307	0.021	0.4
Cooling Tower Fans	201,308	0.374	6.6
HVAC Sub-Total	**1,247,084**	**2.317**	**41.2**
Lights	1,782,377	3.311	58.8
Electric Equipment	0	0.000	0.0
Misc. Electric	0	0.000	0.0
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**1,782,377**	**3.311**	**58.8**
Grand Total	**3,029,461**	**5.628**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **538268.0** ft²
Conditioned Floor Area ..... **538268.0** ft²

7.0 Annual Building Emissions

As stated previously, electricity is provided to the building by Con Ed. Con Ed does not generate the electricity, but rather purchases this electricity from several suppliers (it was estimated by a professional consultant that Con Ed has approximately 30 suppliers). Since acquiring accurate information on the energy source mix would be nearly impossible, the mix provided by the Penn State AE Mechanical Faculty was used to estimate the amount of NO_x, SO_x, CO_2.

According to the HAP analysis, the Hearst Tower consumes 6,235,453 kWh annually. In order to translate this amount into actual pounds of pollutants the following table was computed:

Table 7: **Emissions vs. Primary Source Mix Results**

	llbm Pollutant		
SO_2	NOx	CO_2	Particulates
1.94E+05	1.12E+05	3.26E+07	1.67E+04
2.33E+05	4.29E+04	3.20E+07	1.67E+04
2.04E+02	3.84E+04	2.03E+07	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.27E+05	1.94E+05	8.48E+07	3.33E+04

*For total HVAC&Non-HVAC kWh =15147340

Appendix E contains an expanded spreadsheet showing the energy mix composition used. Emissions were not calculated for the steam generation since the exact composition was not known. Con Ed uses three steam-electric stations, four steam only stations, and capacity supplied by the Brooklyn Navy Cogeneration Partners. In further researching this issue, it was found that production of steam in the Con Ed central Plants is done by either boilers using low sulfur oil or natural gas. Dispersion of emission produced by these plants is done through stacks that range from 350-500 feet in height.

Appendix A

LEED Rating System Summary

THE HEARST BUILDING

Preliminary LEED Evaluation

LEED

4/19/2004

Secure	Possible	Less Likely		Sustainable Sites	14 Points	Action	Report Page
5	3	1	5				
Required				Prereq 1	**Erosion & Sedimentation Control -** Construction Activities must conform to EPA's Storm Water Management recommendations for Construction Activities	Required	**Turner** to Implement Sediment & Erosion Control Plan developed by AKR&F	2
X				Credit 1	**Site Selection -** Avoid developing land restricted by Farmland trust, on land less than 5 ft. above FEMA 100 year flood, within 100ft. of wetlands,on land that is a habitat for endangered species, or public parkland.	1	SWA has confirmed compliance	3
X				Credit 2	**Urban Redevelopment -** Meet local density goals especially in areas of minimum development (<60,000 sq. ft. office space/acre)	1	develop a site drawing incl all bldgs within 601 ft radius of site w/sqft and acreage of each property	4
	X			Credit 3	**Brownfield Redevelopment -** Develop on an EPA Brownfield Site (environmentally damaged or contaminated land)	1	Determine if ASTM Phase II Env. Site Assessment performed for contaminated soils or asbestos abatement	
X				Credit 4.1	**Alternative Transportation**, Public Transportation Access - Locate building within 1/2 mile of commuter rail	1	provide drawings showing subway access from building	5
	X			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Showers for 5% of building population (5% of 2,000 people => 100 Bicycle Racks and 1 Shower per 8 Bicyclists => 13 Showers)	1	**SWA** Resubmit for 7/18 Subway Improvements as alternate to prescribed requirements	6
			X	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations for 3% of capacity i.e. electrical recharging stations in parking garage It is assumed that parking is not in the scope of this project.	1	Unattainable Point	
			X	Credit 4.4	**Alternative Transportation**, Parking Capacity not in excess of zoning and provide carpool and vanpool preferred spots for 5% of building population It is assumed that parking is not in the scope of this project.	1	Unattainable Point	
			X	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space - On previously developed sites, restore a minimum of 50% of the remaining open area	1	Unattainable Point	
		X		Credit 5.2	**Reduced Site Disturbance**, Reduce Development Footprint to exceed local zoning requirements by 25%	1	Develop CIR based on Hearst Ranch project with the American Land Trust	
X				Credit 6.1	**Stormwater Management**, 25% Reduction in Rate or Quantity. Rain water storage to be provided	1	Drawings are complete	7
			X	Credit 6.2	**Stormwater Management** - Provide treatment system to remove 80% of annual post-development total suspended solids (TSS) and 40% of annual post development total phosphorous (TP)	1	**1.Turner** to get breakout price on filtration systems shown on drawings / 2.Develop building O&M to prohibit Total Phosphorus in cleaning products and fertilizer	9
	X			Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**,Non-Roof Provide shade or use high-albedo materials for 30% of non-roof surfaces, i.e. sidewalks (shade developed within 5 years by tree growth)	1	review composition of concrete mixes to meet required high albedo levels	10
X				Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Utilize high reflectance, high emissivity roofing ENERGY STAR roofing for 75% of roof, or vegetated roof for 50% of roof.	1	**Adamson** to spec American HyrdoTech Cool Roof Pavers - confirm	11
			X	Credit 8	**Light Pollution Reduction -**Prevent any interior or exterior direct beam lighting form leaving the site Exceed IESNA foot-candles level requirements zero direct beam illumination from building site.	1	Revise Bird's mouth Lighting	

THE HEARST BUILDING

Preliminary LEED Evaluation

LEED

Secure	Possible	Less Likely	Not Viable		Water Efficiency	5 Points	Action	Report Page
4			1					
X				Credit 1.1	**Water Efficient Landscaping**, Use captured rain or site recycled water for 50% of irrigation needs	1	**SWA** to review CIRs and Previous LEED Project Approvals	13
X				Credit 1.2	**Water Efficient Landscaping**, Use captured rain or site recycled water for 100% of irrigation needs	1	w/above	13
			X	Credit 2	**Innovative Wastewater Technologies -** Limit potable water for sewage conveyance to 50% or treat 100% waste water to tertiary standards	1	requires water treatment facilities on site (not to be pursued)	
X				Credit 3	**Water Use Reduction**, Use 20% less water than stipulated for site in Energy Policy Act of 1992	1	Lav w/Hot & Cold Water & Push-button Metering Controls @0.5gpm Toilets @1.6gpm Urinals @1.0gpm (manual push button) Pantry sinks @1.6gpm Showers @1.5gpm Cafeteria Kitchens are not restricted Requires Fixture Selections to meet above	14
X						1	F&K 3A Josam Stern Apollo 2030 Lav w/Tempered Water & Hard Wired Electronic Controls @0.5gpm Toilets @1.6gpm Urinals @1.0gpm (manual push button) Pantry sinks @1.6gpm Showers @1.5gpm Cafeteria Kitchens are not restricted Requires Fixture Selections to meet above	

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Preliminary LEED Evaluation

LEED

Secure	Possible	Less Likely	Not Viable	Energy & Atmosphere			17 Points	Action	Report Page
6	1		10						
Required				Prereq 1	**Fundamental Building Systems Commissioning -** implement "Best Practices" Building Commissioning procedures		Required	**CA-F&K** 1. Commissioning Authority (CA)-complete 2. Document Design Intent & Basis of Design-pending 3. Specs for Commissioning-complete 4. Commissioning Plan-pending	16
Required				Prereq 2	**Minimum Energy Performance -**the design must conform to ASHRAE / IESNA 90.1-1999		Required	meet ASHRAE 90.1-1999	17
Required				Prereq 3	**CFC Reduction in HVAC&R Equipment -** There can be no CFC based refrigerants in Site HVAC & R systems		Required	Spec equiment free of CFC based refrigeratnts	17
X				Credit 1.1	**Optimize Energy Performance** - The design must exhibit a 12.5 - 17.51% reduction in energy use against a standard building which is in conformance to ASHRAE 90.1-1999 utilizing the Energy Cost Budget Method		1	F&K Lighting Control Option 1 - Time Clocks w/override at Elev. Lobby	18
X				Credit 1.2a	**Optimize Energy Performance** - The design must exhibit a 17.51-22.50% reduction in energy use against a standard building which is in conformance to ASHRAE 90.1-1999 utilizing the Energy Cost Budget Method		1	F&K Lighting Control Option 2 B - Wall Mtd Occupancy Sensors in encl offices & Time Clock in open area (with clock override &"off" sensor overrides)	
X				Credit 1.2b	**Optimize Energy Performance** - The design must exhibit a 22.51-27.50% reduction in energy use against a standard building which is in conformance to ASHRAE 90.1-1999 utilizing the Energy Cost Budget Method		1	**P**oints based on Wall Mtd Occupancy Sensors each office w\"off" overrides & Daylighting Control to shut off lights Time Clock w/override for Interior Daylight Dimming (each Group of 3 Offices at No., So, & East Perimeters) to be reviewed by Gensler	
			X	Credit 1.3	**Optimize Energy Performance**, 40% Necessary strategies for reductions usually cost prohibitive at this level.		2	Unattainable Point	
			X	Credit 1.4	**Optimize Energy Performance**, 50%		2	Unattainable Point	
			X	Credit 1.5	**Optimize Energy Performance**, 60%		2	Unattainable Point	
			X	Credit 2.1	**Renewable Energy**, - Generate 5% of building total energy use with On Site renewable systems		1	Unattainable Point	
			X	Credit 2.2	**Renewable Energy**, 10%		1	Unattainable Point	
			X	Credit 2.3	**Renewable Energy**, 20%		1	Unattainable Point	
X				Credit 3	**Additional Commissioning -** Ensure that all building elements and systems are properly designed, installed and operated as intended		1	**CA-F&K** 1. focused review during document development-pending 2. Focused review at completion of CD drawings-pending 3. Selective review of commissioned equip submittals 4. Develop recommssioning management manual 5. Review at end of warranty period or post occupancy	19
X				Credit 4	**Ozone Depletion** - No usage of HCFC based refrigerants and no Halons for fire suppression systems		1	1. **BEER Assoc.** states that Kitchen Refrigeration Equipment is available at no premium. 2. Chillers and packaged cooling equipment have been selected to avoid HCFCs -complete 3. No halons permitted for fire suppression. 4. Review drinking fountains in public spaces	20
X				Credit 5	**Measurement & Verification -** optimization of building energy and water consumption through the use of ongoing monitoring over time		1	Meters used in lower levels & Roof plus 6 Low and 6 Hi as typical Floors (more required if floors are not typical)	21
	X			Credit 6	**Green Power -** purchase power from a provider of approved renewable generated power (not available)		1	ConEd Solutions now supplies Green-E Certified power at a premium of about 2 cents/ kwh.	22

THE HEARST BUILDING

Preliminary LEED Evaluation

LEED

Secure	Possible	Less Likely	Not Viable		Materials & Resources	13 Points	Action	Report Page
6	1		6					
Required				Prereq 1	**Storage & Collection of Recyclables** - Make provisions for the collection, separation and storage of recyclable waste	Required	Show ground floor recycling area & space for receptacles at each floor (total 500 sqft)	23
			X	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell & Structure	1	Unattainable Point	23
			X	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell & Structure	1	Unattainable Point	23
			X	Credit 1.3	**Building Reuse**, Maintain 100% Shell and Structure & 50% Non-Shell	1	Unattainable Point	23
X				Credit 2.1	**Construction Waste Management**- Recycle and/or salvage 50% of construction waste	1	**Turner** to Develop Demolition/Construction Waste Management Plan (see report listings)	24
X				Credit 2.2	**Construction Waste Management**, Divert 75%	1	**Turner** to investigate Sorting Facility Cost to achieve 75%	24
			X	Credit 3.1	**Resource Reuse** - Specify salvaged or refurbished materials for 5% of new building construction materials (by cost).	1	Unattainable Point	28
			X	Credit 3.2	**Resource Reuse**, Specify 10%	1	Unattainable Point	
X				Credit 4.1	**Recycled Content** - Specify 5% of building materials containing 20% post consumer recycled content or 40% post industrial recycled content Percentages are based on cost. Steel and concrete specs. usually cover a lot of ground. MEP not included in calculations. SEE GBTC REQUIREMENTS	1	**SWA** confirm 1. Create Spreadsheet with Material Costs Only-complete 2. Review SWA Green Mat Rec Report-complete 3. Select 5% by value with recycled content	28
X				Credit 4.2	**Recycled Content**, Specify 10%	1	**w/above**	
X				Credit 5.1	**Local/Regional Materials** - Specify 20% of building materials produced within 500 miles of the site to reduce transportation pollution	1	1. Create Spreadsheet with Material Costs Only-complete 2. Select 20% by value within 500 mile radius (see report for supplier info)	29
	X			Credit 5.2	**Local/Regional Materials** - Specify 50% of above Locally Harvested	1	**w/above**	
			X	Credit 6	**Rapidly Renewable Materials -** Specify the use of rapidly renewable materials for 5% of building materials	1	Unattainable Point	
X				Credit 7	**Certified Wood -** Specify the use of 50% of wood based materials from certified forests SEE GBTC REQUIREMENTS	1	**Turner** to specify leasing Develop Spec for certified wood for fixed furniture and wood work; movable furniture is not included in calculations. Formwork can be included in calcs if desired, but it can be excluded if leased (as opposed to purchased)	32

THE HEARST BUILDING

Preliminary LEED Evaluation

LEED

Secure	Possible	Less Likely	Not Viable					
11	1	1	2	**Indoor Environmental Quality**		**15** Points	**Action**	**Report Page**
Required				Prereq 1	**Minimum IAQ Performance -** Conformance to ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality	Required	F&K has conformed design with ASHRAE 62-1999	34
Required				Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control -** Prohibit smoking in all buildings areas or provide directly exhausted designated areas	Required	Provide smoking rooms with required exhaust and floor to slab partitions	34
X				Credit 1	**Carbon Dioxide** (CO_2) **Monitoring -** Install and maintain CO2 monitoring system and specify initial operating set points	1	Provide CO2 Monitoring System (contact telair.com for payback analysis)	35
X				Credit 2	**Increase Ventilation Effectiveness -** achieve ventilation effectiveness of 0.9 (ASHRAE 129-1997) or provide equivalent demonstration	1	F&K has conformed design with ASHRAE 129-1997 or Referenced ASHRAE standard	37
X				Credit 3.1	**Construction IAQ Management Plan**, During Construction SEE GBTC REQUIREMENTS	1	**Turner** to Provide Construction IAQ Management Plan based on SMACNA IAQ & LEED guidelines for occupied buildings under construction, include protection of absorptive materials, & filter replacement plan / budget / Mold Prevention Plan	37
X				Credit 3.2	**Construction IAQ Management Plan** - Flush occupied spaces with 100% outside air and new filter media for 2 weeks prior to occupancy SEE GBTC REQUIREMENTS	1	Provide plan for building purge and flush-out prior to occupancy Coordinate move in of VOC emitting materials	38
X				Credit 4.1	**Low-Emitting Materials** - Adhesives & Sealants must meet or exceed VOC limits SEE GBTC REQUIREMENTS	1	Develop Specification for Low VOC emitting materials (see report for info)	39
X				Credit 4.2	**Low-Emitting Materials** - Paints must meet or exceed VOC limits	1	Develop Specification for Low VOC emitting materials (see report for info)	40
X				Credit 4.3	**Low-Emitting Materials** - Carpet must meet Carpet and Rug institute limits	1	Develop Specification for Low emitting materials (see report for info)	41
X				Credit 4.4	**Low-Emitting Materials** - Composite Wood must contain no added Urea-formaldehyde resins	1	Develop Specification for Low emitting materials (see report for info)	42
X				Credit 5	**Indoor Chemical & Pollutant Source Control -** design to physically isolate activities associated with chemical containments and design effective air exhausting and filtration systems for all such spaces. Provide floor grilles at entrances. Provide walls at Copy rooms and at other spaces that emit noxiuos fumes, slab to slab. Provide Exhaust systems for, and test depressurization of these spaces with tracer gases.	1	**F&P\Adamson** Provide recessed entry way walk-off mat systems, floor to deck partitioning where required,dedicated exhaust where required provide housekeeping closets where shown w/sinks, proper drainage at chemical mixing - pending	44
			X	Credit 6.1	**Controllability of Systems** - One operable window and lighting control zone for every 200 sq.ft. of perimeter space	1	Unattainable Point	
			X	Credit 6.2	**Controllability of Systems** - Control for each individual of temperature and lighting for 50% of people within the non-perimeter areas	1	Unattainable Point	
X				Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1	Provide design to ASHRAE 55-1992-in design documents	45
X				Credit 7.2	**Thermal Comfort** - Install Permanent Monitoring System Temp & Humidifier System	1	Provide temp & humidity monitoring and control system -in design documents	45
	X			Credit 8.1	**Daylight & Views** - Provide a connection between interior and exterior areas with the use of natural light and views. Achieve Daylighting factor of 2% in 75% of all occupied spaces that are used for visual tasks.	1	Foster/Gensler/SWA to investigate	46
		X		Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1	Foster/Gensler/SWA to investigate	46

THE HEARST BUILDING

Preliminary LEED Evaluation

LEED

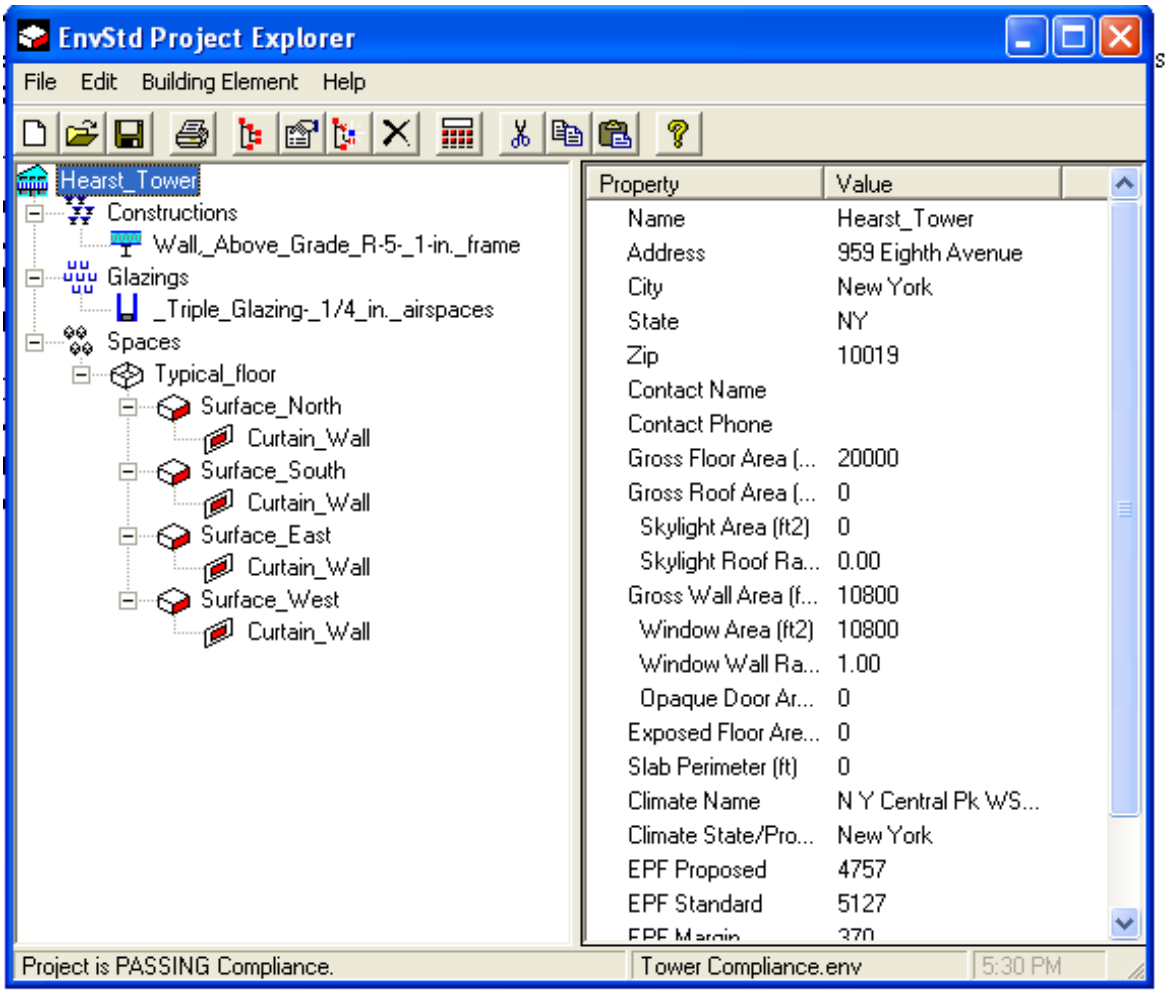
Secure	Possible	Less Likely	Not Viable					
5				Innovation & Design Process		5 Points	Action	Report Page
X				Credit 1.1	**Innovation in Design**: Innovative Structural Syatem	1	Rejected by LEED (use for MR 2.1 Construction Waste Management)	
X				Credit 1.2	**Innovation in Design**: Exemplary Performance - Water Savings	1	SWA to re-submit - on hold	
X				Credit 1.3	**Innovation in Design**: Educational Feature w/ Outreach	1	Submit as SS 4.2	
X				Credit 1.4	**Innovation in Design**:Exemplary Performance - IAQ	1	F&K to develop narrative /SWA to apply for ruling - on hold	
X				Credit 2	**LEED™ Accredited Professional (4 points for innovation allowed in addition to this point)**	1		

Secure	Possible	Less Likely	Not Viable			
37	6	2	24	**Project Totals**	**69** Points	

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Appendix B

EnvStd Program Report (Typical Tower Floor)


EnvStd Project Explorer
File
Edit
Building Element
Help
Hearst_Tower
Constructions
Wall,_Above_Grade_R-5-_1-in._frame
Glazings
_Triple_Glazing-_1/4_in._airspaces
Spaces
Typical_floor
Surface_North
Curtain_Wall
Surface_South
Curtain_Wall
Surface_East
Curtain_Wall
Surface_West
Curtain_Wall
Property
Value
Name
Hearst_Tower
Address
959 Eighth Avenue
City
New York
State
NY
Zip
10019
Contact Name
Contact Phone
Gross Floor Area (...
20000
Gross Roof Area (...
0
Skylight Area (ft2)
0
Skylight Roof Ra...
0.00
Gross Wall Area (f...
10800
Window Area (ft2)
10800
Window Wall Ra...
1.00
Opaque Door Ar...
0
Exposed Floor Are...
0
Slab Perimeter (ft)
0
Climate Name
N Y Central Pk WS...
Climate State/Pro...
New York
EPF Proposed
4757
EPF Standard
5127
Project is PASSING Compliance.
Tower Compliance.env
5:30 PM

Project Summary Information
Name: Hearst_Tower
Address: 959 Eighth Avenue
City/State/Zip: New York, NY 10019
Climate Location: N Y Central Pk WSO City, New York
Standard EnvStd climate data is used for compliance
Floor Area (ft2): 20000
Gross Wall Area (ft2): 8100
Window Area (ft2): 8100
Window Wall Ratio: 1.00
Gross Roof Area (ft2): 0
Skylight Roof Ratio: 0.00
Skylight Area (ft2): 0
Door Area (ft2): 0

Compliance Summary -- PASSES

EPF	Proposed	Standard	Margin
Roofs	0	0	0
Skylights	0	0	0
Walls	2874	2979	106
Below-Grade Walls	0	0	0
Floors	0	0	0
Slabs	0	0	0
Daylighting Potential	762	887	125
Total	3636	3866	230

Opaque Construction Schedule

Code	Description	Net Area/Length	U-factor	HC	R-Cav	R-Shth
Total		0				

Fenestration Schedule

Code	Description	Area	U-factor	SHGC	SC	Tvis
G-1	User Defined-Window-Fixed-Aluminum without Thermal Break-Tinted-_Triple_Glazing-_1/4_in._airspaces (User Defined)	8100	0.22*	0.2494*	0.29*	0.59
Total Area		8100				

Space Category: Typical_floor
Floor Area (ft2): 20000
Gross Wall Area (ft2): 8100
Window Area (ft2): 8100
Window Wall Ratio: 1.00
Gross Roof Area (ft2): 0
Skylight Roof Ratio: 0.00
Skylight Area (ft2): 0
Door Area (ft2): 0

Surfaces

Name	Type	Const. Code	Area	Orient	Notes
Surface_South	Wall	C-1	2700	North	n.a.
Surface_East	Wall	C-1	2700	East	n.a.
Surface_West	Wall	C-1	2700	West	n.a.
Total			8100		

Openings

Name	Type	Const. Code	Area	Orient.	Notes
Curtain_Wall	Window	G-1	2700	North	n.a.
Curtain_Wall	Window	G-1	2700	East	n.a.

Curtain_Wall	Window	G-1	2700	West	n.a.
Total			8100		

Appendix C
HAP Load Estimate Results

Air System Design Load Summary for AC-2-7,8

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:33PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1500 COOLING OA DB / WB 92.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 13.0 °F / 10.4 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	410 ft²	7051	-	410 ft²	-	-
Wall Transmission	2792 ft²	3758	-	2792 ft²	9146	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	410 ft²	1296	-	410 ft²	5135	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	12168 W	41516	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	45	11025	9225	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**64646**	**9225**	**-**	**14281**	**0**
Zone Conditioning	-	63321	9225	-	11497	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	2614 CFM	0	-	31 CFM	0	-
Ventilation Load	1679 CFM	26342	38133	20 CFM	1176	0
Supply Fan Load	2614 CFM	980	-	31 CFM	-249	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**90644**	**47358**	**-**	**12423**	**0**
Central Cooling Coil	-	90644	47360	-	-81	0
Preheat Coil	-	0	-	-	588	-
Terminal Reheat Coils	-	0	-	-	11917	-
>> Total Conditioning	**-**	**90644**	**47360**	**-**	**12423**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Air System Design Load Summary for AC-G-1

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:50PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 92.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 13.0 °F / 10.4 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	644 ft²	5861	-	644 ft²	-	-
Wall Transmission	3515 ft²	3619	-	3515 ft²	11515	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	644 ft²	2036	-	644 ft²	8069	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	30363 W	103596	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	433	100639	57910	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**215750**	**57910**	**-**	**19584**	**0**
Zone Conditioning	-	214385	57910	-	12573	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	8797 CFM	0	-	100 CFM	0	-
Ventilation Load	7311 CFM	113663	140543	83 CFM	4918	0
Supply Fan Load	8797 CFM	9894	-	100 CFM	-2402	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**337942**	**198453**	**-**	**15089**	**0**
Central Cooling Coil	-	337942	198453	-	-1862	0
Preheat Coil	-	0	-	-	2991	-
Terminal Reheat Coils	-	0	-	-	13960	-
>> Total Conditioning	**-**	**337942**	**198453**	**-**	**15089**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Air System Design Load Summary for AHU-4-2

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:54PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 91.6 °F / 73.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 13.0 °F / 10.4 °F		
ZONE LOADS	**Details**	**Sensible (BTU/hr)**	**Latent (BTU/hr)**	**Details**	**Sensible (BTU/hr)**	**Latent (BTU/hr)**
Window & Skylight Solar Loads	176 ft²	3393	-	176 ft²	-	-
Wall Transmission	1350 ft²	1735	-	1350 ft²	4421	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	176 ft²	537	-	176 ft²	2201	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	7462 W	25459	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	20	4900	4100	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**36025**	**4100**	**-**	**6622**	**0**
Zone Conditioning	-	35281	4100	-	4904	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	1456 CFM	0	-	17 CFM	0	-
Ventilation Load	253 CFM	3843	5859	3 CFM	177	0
Supply Fan Load	1456 CFM	1638	-	17 CFM	-415	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**40763**	**9959**	**-**	**4666**	**0**
Central Cooling Coil	-	40763	9963	-	-475	0
Preheat Coil	-	0	-	-	0	-
Terminal Reheat Coils	-	0	-	-	5140	-
>> Total Conditioning	**-**	**40763**	**9963**	**-**	**4666**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Air System Design Load Summary for AHU-28-1,2,3,4

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:45PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1500 COOLING OA DB / WB 92.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 13.0 °F / 10.4 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	175776 ft²	2378204	-	175776 ft²	-	-
Wall Transmission	17736 ft²	21723	-	17736 ft²	58108	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	175776 ft²	556260	-	175776 ft²	2204231	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	932486 W	3181584	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	4901	1187724	931010	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**7325494**	**931010**	**-**	**2262340**	**0**
Zone Conditioning	-	7039111	931010	-	2040390	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	290523 CFM	0	-	3455 CFM	0	-
Ventilation Load	82225 CFM	1289921	2396371	978 CFM	57241	-3280
Supply Fan Load	290523 CFM	1416520	-	3455 CFM	-358991	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**9745551**	**3327381**	**-**	**1738640**	**-3280**
Central Cooling Coil	-	9745554	3327512	-	-347438	-3280
Preheat Coil	-	0	-	-	0	-
Terminal Reheat Coils	-	0	-	-	2086079	-
>> Total Conditioning	**-**	**9745554**	**3327512**	**-**	**1738640**	**-3280**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Air System Design Load Summary for AHU-B-1,2,3

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:57PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1500 COOLING OA DB / WB 92.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 13.0 °F / 10.4 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	429 ft²	5710	-	429 ft²	-	-
Wall Transmission	2849 ft²	3700	-	2849 ft²	9334	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	429 ft²	1358	-	429 ft²	5380	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	28616 W	68346	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	791	182828	100020	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**261941**	**100020**	**-**	**14714**	**0**
Zone Conditioning	-	261100	100020	-	7984	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	70%	0	-	0	0	-
Plenum Lighting Load	30%	29292	-	0	0	-
Return Fan Load	10974 CFM	0	-	153 CFM	0	-
Ventilation Load	10974 CFM	147654	184754	153 CFM	9072	0
Supply Fan Load	10974 CFM	22943	-	153 CFM	-6740	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**460989**	**284774**	**-**	**10315**	**0**
Central Cooling Coil	-	460989	284774	-	-5915	0
Preheat Coil	-	0	-	-	6110	-
Terminal Reheat Coils	-	0	-	-	10120	-
>> Total Conditioning	**-**	**460989**	**284774**	**-**	**10315**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Air System Design Load Summary for AHU-4-1

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:52PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 92.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 13.0 °F / 10.4 °F		
ZONE LOADS	**Details**	**Sensible (BTU/hr)**	**Latent (BTU/hr)**	**Details**	**Sensible (BTU/hr)**	**Latent (BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	412 ft²	544	-	412 ft²	1350	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	6231 W	21261	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	191	46674	38475	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	**-**	**68480**	**38475**	**-**	**1350**	**0**
Zone Conditioning	-	68429	38475	-	171	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	2807 CFM	0	-	32 CFM	0	-
Ventilation Load	2527 CFM	39265	30539	29 CFM	1718	0
Supply Fan Load	2807 CFM	4209	-	32 CFM	-1019	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	**-**	**111903**	**69014**	**-**	**870**	**0**
Central Cooling Coil	-	111903	69014	-	-848	0
Preheat Coil	-	0	-	-	1080	-
Terminal Reheat Coils	-	0	-	-	637	-
>> Total Conditioning	**-**	**111903**	**69014**	**-**	**870**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Air System Sizing Summary for AHU-B-1,2,3

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:57PM

Air System Information

Air System Name	**AHU-B-1,2,3**	Number of zones	**1**
Equipment Class	**CW AHU**	Floor Area	**15141.0** ft²
Air System Type	**VAV**	Location	**New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

Total coil load	**62.1**	Tons	Load occurs at	**Aug 1500**	
Total coil load	**745.8**	MBH	OA DB / WB	**92.0 / 74.0**	°F
Sensible coil load	**461.0**	MBH	Entering DB / WB	**93.9 / 74.5**	°F
Coil CFM at Aug 1500	**10974**	CFM	Leaving DB / WB	**55.0 / 53.6**	°F
Max block CFM at Aug 1400	**15307**	CFM	Coil ADP	**50.7**	°F
Sum of peak zone CFM	**15307**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.618**		Resulting RH	**52**	%
ft²/Ton	**243.6**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**49.3**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**149.23**	gpm	Max zone temperature deviation	**0.0**	°F

Preheat Coil Sizing Data

Max coil load	**52.8**	MBH	Load occurs at	**Jan 0500**	
Coil CFM at Jan 0500	**9415**	CFM	Ent. DB / Lvg DB	**44.8 / 50.0**	°F
Max coil CFM	**15307**	CFM			
Water flow @ 20.0 °F drop	**5.28**	gpm			

Supply Fan Sizing Data

Actual max CFM at Aug 1400	**15307**	CFM	Fan motor BHP	**12.26**	BHP
Standard CFM	**15290**	CFM	Fan motor kW	**9.15**	kW
Actual max CFM/ft²	**1.01**	CFM/ft²	Fan static	**2.75**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**15307**	CFM	CFM/person	**19.35**	CFM/person
CFM/ft²	**1.01**	CFM/ft²			

Air System Sizing Summary for AC-2-7,8

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:33PM

Air System Information

Air System Name	**AC-2-7,8**	Number of zones	**1**
Equipment Class	**CW AHU**	Floor Area	**6438.0** ft²
Air System Type	**VAV**	Location	**New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

Total coil load	**11.5**	Tons	Load occurs at	**Aug 1500**	
Total coil load	**138.0**	MBH	OA DB / WB	**92.0 / 74.0**	°F
Sensible coil load	**90.6**	MBH	Entering DB / WB	**86.8 / 70.4**	°F
Coil CFM at Aug 1500	**2614**	CFM	Leaving DB / WB	**54.7 / 53.4**	°F
Max block CFM at Sep 1300	**3115**	CFM	Coil ADP	**51.1**	°F
Sum of peak zone CFM	**3115**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.657**		Resulting RH	**45**	%
ft²/Ton	**559.8**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**21.4**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**27.62**	gpm	Max zone temperature deviation	**0.0**	°F

Preheat Coil Sizing Data

Max coil load	**0.6**	MBH	Load occurs at	**Des Htg**	
Coil CFM at Des Htg	**31**	CFM	Ent. DB / Lvg DB	**32.5 / 50.0**	°F
Max coil CFM	**3115**	CFM			
Water flow @ 20.0 °F drop	**0.06**	gpm			

Supply Fan Sizing Data

Actual max CFM at Sep 1300	**3115**	CFM	Fan motor BHP	**0.45**	BHP
Standard CFM	**3111**	CFM	Fan motor kW	**0.34**	kW
Actual max CFM/ft²	**0.48**	CFM/ft²	Fan static	**0.50**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**2000**	CFM	CFM/person	**44.44**	CFM/person
CFM/ft²	**0.31**	CFM/ft²			

Air System Sizing Summary for AHU-4-2

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:54PM

Air System Information

Air System Name	**AHU-4-2**	Number of zones	**1**
Equipment Class	**CW AHU**	Floor Area	**3948.0** ft²
Air System Type	**VAV**	Location	**New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

Total coil load	**4.2**	Tons	Load occurs at	**Aug 1400**	
Total coil load	**50.7**	MBH	OA DB / WB	**91.6 / 73.9**	°F
Sensible coil load	**40.8**	MBH	Entering DB / WB	**81.0 / 65.5**	°F
Coil CFM at Aug 1400	**1456**	CFM	Leaving DB / WB	**55.0 / 53.6**	°F
Max block CFM at Oct 1300	**1729**	CFM	Coil ADP	**52.1**	°F
Sum of peak zone CFM	**1729**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.804**		Resulting RH	**45**	%
ft²/Ton	**934.0**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**12.8**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**10.15**	gpm	Max zone temperature deviation	**0.0**	°F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM at Oct 1300	**1729**	CFM	Fan motor BHP	**0.76**	BHP
Standard CFM	**1727**	CFM	Fan motor kW	**0.56**	kW
Actual max CFM/ft²	**0.44**	CFM/ft²	Fan static	**1.50**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**300**	CFM	CFM/person	**15.00**	CFM/person
CFM/ft²	**0.08**	CFM/ft²			

Air System Sizing Summary for AHU-28-1,2,3,4

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:45PM

Air System Information

Air System Name	**AHU-28-1,2,3,4**	Number of zones	**8**
Equipment Class	**CW AHU**	Floor Area	**493379.0** ft²
Air System Type	**VAV**	Location	**New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

Total coil load	**1089.4**	Tons	Load occurs at	**Aug 1500**	
Total coil load	**13073.1**	MBH	OA DB / WB	**92.0 / 74.0**	°F
Sensible coil load	**9745.6**	MBH	Entering DB / WB	**81.6 / 65.2**	°F
Coil CFM at Aug 1500	**290523**	CFM	Leaving DB / WB	**50.5 / 49.2**	°F
Max block CFM at Sep 1400	**344899**	CFM	Coil ADP	**47.0**	°F
Sum of peak zone CFM	**345522**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.745**		Resulting RH	**39**	%
ft²/Ton	**452.9**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**26.5**		Zone T-stat Check	**8 of 8**	OK
Water flow @ 10.0 °F rise	**2616.01**	gpm	Max zone temperature deviation	**0.0**	°F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM at Sep 1400	**344899**	CFM	Fan motor BHP	**653.16**	BHP
Standard CFM	**344525**	CFM	Fan motor kW	**487.06**	kW
Actual max CFM/ft²	**0.70**	CFM/ft²	Fan static	**6.50**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**97615**	CFM	CFM/person	**19.92**	CFM/person
CFM/ft²	**0.20**	CFM/ft²			

Air System Sizing Summary for AC-G-1

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:50PM

Air System Information

Air System Name	**AC-G-1**	Number of zones	**1**
Equipment Class	**CW AHU**	Floor Area	**16065.0** ft²
Air System Type	**VAV**	Location	**New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

Total coil load	**44.7**	Tons	Load occurs at	**Jul 1500**	
Total coil load	**536.4**	MBH	OA DB / WB	**92.0 / 74.0**	°F
Sensible coil load	**337.9**	MBH	Entering DB / WB	**90.6 / 72.8**	°F
Coil CFM at Jul 1500	**8797**	CFM	Leaving DB / WB	**55.0 / 53.7**	°F
Max block CFM at Jul 1700	**10000**	CFM	Coil ADP	**51.0**	°F
Sum of peak zone CFM	**10000**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.630**		Resulting RH	**49**	%
ft²/Ton	**359.4**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**33.4**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**107.34**	gpm	Max zone temperature deviation	**0.0**	°F

Preheat Coil Sizing Data

Max coil load	**3.0**	MBH	Load occurs at	**Des Htg**	
Coil CFM at Des Htg	**100**	CFM	Ent. DB / Lvg DB	**22.3 / 50.0**	°F
Max coil CFM	**10000**	CFM			
Water flow @ 20.0 °F drop	**0.30**	gpm			

Supply Fan Sizing Data

Actual max CFM at Jul 1700	**10000**	CFM	Fan motor BHP	**4.37**	BHP
Standard CFM	**9989**	CFM	Fan motor kW	**3.26**	kW
Actual max CFM/ft²	**0.62**	CFM/ft²	Fan static	**1.50**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**8310**	CFM	CFM/person	**19.19**	CFM/person
CFM/ft²	**0.52**	CFM/ft²			

Air System Sizing Summary for AHU-4-1

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:52PM

Air System Information

Air System Name	**AHU-4-1**	Number of zones	**1**
Equipment Class	**CW AHU**	Floor Area	**3297.0** ft²
Air System Type	**VAV**	Location	**New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM	**Peak zone sensible load**	Calculation Months	**Jan to Dec**
Space CFM	**Individual peak space loads**	Sizing Data	**Calculated**

Central Cooling Coil Sizing Data

Total coil load	**15.1**	Tons	Load occurs at	**Jul 1500**	
Total coil load	**180.9**	MBH	OA DB / WB	**92.0 / 74.0**	°F
Sensible coil load	**111.9**	MBH	Entering DB / WB	**92.0 / 73.7**	°F
Coil CFM at Jul 1500	**2807**	CFM	Leaving DB / WB	**55.0 / 53.7**	°F
Max block CFM at Jul 2300	**3183**	CFM	Coil ADP	**50.9**	°F
Sum of peak zone CFM	**3183**	CFM	Bypass Factor	**0.100**	
Sensible heat ratio	**0.619**		Resulting RH	**56**	%
ft²/Ton	**218.7**		Design supply temp.	**55.0**	°F
BTU/(hr-ft²)	**54.9**		Zone T-stat Check	**1 of 1**	OK
Water flow @ 10.0 °F rise	**36.20**	gpm	Max zone temperature deviation	**0.0**	°F

Preheat Coil Sizing Data

Max coil load	**5.2**	MBH	Load occurs at	**Jan 0500**	
Coil CFM at Jan 0500	**2465**	CFM	Ent. DB / Lvg DB	**48.0 / 50.0**	°F
Max coil CFM	**3183**	CFM			
Water flow @ 20.0 °F drop	**0.52**	gpm			

Supply Fan Sizing Data

Actual max CFM at Jul 2300	**3183**	CFM	Fan motor BHP	**1.85**	BHP
Standard CFM	**3179**	CFM	Fan motor kW	**1.38**	kW
Actual max CFM/ft²	**0.97**	CFM/ft²	Fan static	**2.00**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**2865**	CFM	CFM/person	**15.00**	CFM/person
CFM/ft²	**0.87**	CFM/ft²			

Zone Sizing Summary for AC-2-7,8

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:33PM

Air System Information

Air System Name **AC-2-7,8**
Equipment Class ..... **CW AHU**
Air System Type ..... **VAV**

Number of zones **1**
Floor Area ..... **6438.0** ft²
Location ..... **New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM ..... **Peak zone sensible load**
Space CFM ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft²)	Zone CFM/ft²
Zone 1	67.2	3115	31	Sep 1300	14.3	6438.0	0.48

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Coil Load (MBH)	Zone Htg Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	14.3	1.43	0.0	0.00	0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
2 Copy Center	1	29.7	Sep 1300	1475	7.3	2950.0	0.50
2 Mail/Receiving Room	1	37.5	Sep 1300	1736	7.0	3488.0	0.50

Zone Sizing Summary for AC-G-1

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:50PM

Air System Information

Air System Name **AC-G-1**
Equipment Class ..... **CW AHU**
Air System Type ..... **VAV**
Number of zones **1**
Floor Area ..... **16065.0** ft²
Location ..... **New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM ..... **Peak zone sensible load**
Space CFM ..... **Individual peak space loads**
Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft²)	Zone CFM/ft²
Zone 1	215.8	10000	100	Jul 1700	19.6	16065.0	0.62

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Coil Load (MBH)	Zone Htg Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	19.6	1.96	0.0	0.00	0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
2 Hearst Function	1	149.5	Jul 1400	7260	10.9	9098.0	0.80
4 Hearst Function	1	27.0	Jun 1700	1253	4.4	2788.0	0.45
4 Hearst Function(2)	1	39.4	Jun 1700	1827	4.4	4179.0	0.44

Zone Sizing Summary for AHU-4-1

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:52PM

Air System Information

Air System Name **AHU-4-1**
Equipment Class ..... **CW AHU**
Air System Type ..... **VAV**

Number of zones **1**
Floor Area ..... **3297.0** ft²
Location ..... **New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM ..... **Peak zone sensible load**
Space CFM ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft²)	Zone CFM/ft²
Zone 1	68.7	3183	32	Jul 2300	1.3	3297.0	0.97

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Coil Load (MBH)	Zone Htg Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	1.3	0.14	0.0	0.00	0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
2 Auditorium	1	11.9	Jul 2300	552	1.3	1447.0	0.38
3 Auditiorium	1	56.8	Jan 2300	2745	0.0	1850.0	1.48

Zone Sizing Summary for AHU-4-2

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:54PM

Air System Information

Air System Name **AHU-4-2**
Equipment Class ..... **CW AHU**
Air System Type ..... **VAV**

Number of zones **1**
Floor Area ..... **3948.0** ft²
Location ..... **New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM ..... **Peak zone sensible load**
Space CFM ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft²)	Zone CFM/ft²
Zone 1	37.3	1729	17	Oct 1300	6.6	3948.0	0.44

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Coil Load (MBH)	Zone Htg Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	6.6	0.66	0.0	0.00	0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
3 kitchen	1	32.3	Oct 1300	1496	5.0	3479.0	0.43
4 Kitchen Plant	1	5.1	Sep 1300	235	1.7	469.0	0.50

Zone Sizing Summary for AHU-28-1,2,3,4

Project Name: Hearst Tower
Prepared by: psuae

10/30/2005
08:45PM

Air System Information

Air System Name **AHU-28-1,2,3,4**
Equipment Class ..... **CW AHU**
Air System Type ..... **VAV**

Number of zones **8**
Floor Area ..... **493379.0** ft²
Location ..... **New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM ..... **Peak zone sensible load**
Space CFM ..... **Individual peak space loads**

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft²)	Zone CFM/ft²
Zone 1	5250.3	243332	2433	Sep 1400	1738.5	320000.0	0.76
Zone 2	394.0	18259	183	Jul 1300	67.4	37520.0	0.49
Zone 3	411.4	19067	191	Jul 1300	74.4	38360.0	0.50
Zone 4	205.7	9533	95	Jul 1300	37.2	19180.0	0.50
Zone 5	130.8	6062	61	Sep 1400	33.1	9865.0	0.61
Zone 6	353.0	16359	164	Sep 1400	93.9	25093.0	0.65
Zone 7	383.8	17788	178	Sep 1400	114.2	30062.0	0.59
Zone 8	326.3	15121	151	Sep 1400	103.7	13299.0	1.14

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Coil Load (MBH)	Zone Htg Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	1738.5	173.94	0.0	0.00	0
Zone 2	67.4	6.74	0.0	0.00	0
Zone 3	74.4	7.45	0.0	0.00	0
Zone 4	37.2	3.72	0.0	0.00	0
Zone 5	33.1	3.31	0.0	0.00	0
Zone 6	93.9	9.39	0.0	0.00	0
Zone 7	114.2	11.43	0.0	0.00	0
Zone 8	103.7	10.38	0.0	0.00	0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
10-28,34,35 Open Office	20	262.5	Sep 1400	12167	86.9	16000.0	0.76
Zone 2							
29-33 Conference	2	9.1	Jun 1700	420	3.5	420.0	1.00
29-33 Large Office	4	4.1	Jun 1700	191	2.3	280.0	0.68
29-33 Office	12	2.2	Jun 1700	100	1.2	140.0	0.71
29-33 Office South	12	4.1	Oct 1300	192	1.2	140.0	1.37
29-33 Open Office	2	144.2	Jul 0900	6681	11.2	14500.0	0.46
29-33 Workroom	10	1.6	Jan 2300	74	0.0	210.0	0.35
29-33 Workroom Ext	2	4.3	Jul 2300	198	0.4	550.0	0.36
Zone 3							
29-33 Office	12	2.2	Jun 1700	100	1.2	140.0	0.71
29-33 Office South	12	4.1	Oct 1300	192	1.2	140.0	1.37
29-33 Open Office	2	144.2	Jul 0900	6681	11.2	14500.0	0.46
29-33 Workroom	10	1.6	Jan 2300	74	0.0	210.0	0.35
29-33 Workroom Ext	2	4.3	Jul 2300	198	0.4	550.0	0.36

Zone Sizing Summary for AHU-28-1,2,3,4

Project Name: Hearst Tower
Prepared by: psuae

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
29-33 Conference	4	9.1	Jun 1700	420	3.5	420.0	1.00
29-33 Large Office	4	4.1	Jun 1700	191	2.3	280.0	0.68
Zone 4							
29-33 Conference	2	9.1	Jun 1700	420	3.5	420.0	1.00
29-33 Large Office	2	4.1	Jun 1700	191	2.3	280.0	0.68
29-33 Office	6	2.2	Jun 1700	100	1.2	140.0	0.71
29-33 Office South	6	4.1	Oct 1300	192	1.2	140.0	1.37
29-33 Open Office	1	144.2	Jul 0900	6681	11.2	14500.0	0.46
29-33 Workroom	5	1.6	Jan 2300	74	0.0	210.0	0.35
29-33 Workroom Ext	1	4.3	Jul 2300	198	0.4	550.0	0.36
Zone 5							
36 Argyle Studio	1	18.6	Oct 1300	864	4.1	800.0	1.08
36 Conference North	1	9.0	Jun 1700	416	2.6	425.0	0.98
36 Interior Conference	1	4.7	Jan 2300	240	0.0	300.0	0.80
36 Interior Office	2	1.4	Jan 2300	66	0.0	186.0	0.36
36 Large office NE	1	5.5	Jun 0800	256	2.3	297.0	0.86
36 Large office NW	1	6.4	Jun 1700	297	2.3	297.0	1.00
36 Office 29	1	1.3	Jan 2300	60	0.0	165.0	0.36
36 Office 33	1	1.3	Jan 2300	60	0.0	165.0	0.36
36 Office 34	1	1.6	Jan 2300	73	0.0	210.0	0.35
36 Office East	4	4.3	Jul 0900	201	1.2	266.0	0.76
36 Office North	6	3.0	Jun 1700	137	1.2	266.0	0.52
36 Office South	8	4.9	Oct 1300	229	1.2	266.0	0.86
36 Office West	1	4.7	Jul 1700	218	1.2	266.0	0.82
36 Open Office(1)	15	0.7	Jan 2300	33	0.0	75.0	0.44
36 Reception	1	3.4	Jan 2300	157	0.0	455.0	0.35
36 Tech Room	1	2.3	Jan 2300	105	0.0	200.0	0.53
Zone 6							
37 Large Office South(2)	4	6.1	Oct 1300	284	1.7	210.0	1.35
37-38 Conference (N)	2	8.1	Jun 1700	375	3.0	350.0	1.07
37-38 Conference (S)	2	13.2	Oct 1300	610	3.0	350.0	1.74
37-38 Large Office South	2	6.1	Oct 1300	284	1.7	210.0	1.35
37-38 Large Office West	2	5.8	Jul 1700	267	1.7	210.0	1.27
37-38 Library	1	3.4	Jan 2300	160	0.0	345.0	0.46
37-38 NE Conference	2	3.5	Jun 0800	162	1.0	165.0	0.98
37-38 NW Conference	2	3.9	Jun 1700	181	1.0	165.0	1.10
37-38 Office East	16	3.5	Jul 0900	163	1.2	140.0	1.17
37-38 Office North	18	2.2	Jun 1700	100	1.2	140.0	0.71
37-38 Office South	16	4.1	Oct 1300	192	1.2	140.0	1.37
37-38 Office West	2	3.9	Jul 1700	180	1.2	140.0	1.29
37-38 Open Office	10	8.2	Jan 2300	382	0.0	1050.0	0.36
37-38 SE Conference	2	4.2	Sep 1000	196	1.0	165.0	1.19
37-38 SW Conference	2	4.5	Sep 1500	208	1.0	165.0	1.26
37-38 TBD	2	1.5	Jan 2300	70	0.0	200.0	0.35
37-38 Trademark Legal	2	6.4	Jan 2300	295	0.0	880.0	0.34
37-38 Workroom Interior	2	1.5	Jan 2300	72	0.0	204.0	0.35
Zone 7							
39-40 Conference	2	8.4	Jun 1700	388	2.8	480.0	0.81
39-40 Conference Sout(2)	4	13.2	Oct 1300	614	2.8	480.0	1.28
39-40 East Office	8	8.7	Jul 0900	404	2.3	560.0	0.72
39-40 Ext Workroom	2	4.4	Jan 2300	206	0.0	576.0	0.36
39-40 Fileroom	2	4.4	Jan 2300	205	0.0	580.0	0.35
39-40 NE Corner Office	2	9.8	Jun 0900	456	4.6	560.0	0.81
39-40 North Office	12	5.9	Jun 1700	275	2.3	560.0	0.49
39-40 NW Corner Office	2	11.2	Jun 1700	520	4.6	560.0	0.93

Zone Sizing Summary for AHU-28-1,2,3,4

Project Name: Hearst Tower
Prepared by: psuae

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
39-40 Open Office	32	1.3	Jan 2300	61	0.0	165.0	0.37
39-40 Reception	2	2.5	Jan 2300	114	0.0	275.0	0.42
39-40 SE Corner Office	2	12.2	Sep 1300	567	4.6	560.0	1.01
39-40 South Office	6	9.9	Oct 1300	460	2.3	560.0	0.82
39-40 SW Corner Office	2	13.3	Sep 1500	614	4.6	560.0	1.10
Zone 8							
41 Executive Dining	1	161.3	Jul 0900	7474	54.8	4037.0	1.85
41 GHK Dining Room	1	6.7	Jan 2300	312	0.0	546.0	0.57
41 GHK Living Room	1	3.6	Jan 2300	166	0.0	342.0	0.49
41 Hearst Family Gallery	1	36.4	Jun 1700	1687	15.4	2767.0	0.61
41 Kitchen	1	11.1	Jan 2300	515	0.0	1420.0	0.36
41 Meeting Room G	1	17.2	Oct 1300	796	3.3	530.0	1.50
41 Meeting Room H	1	17.2	Oct 1300	796	3.3	530.0	1.50
41 Meeting Room I	1	17.2	Oct 1300	796	3.3	530.0	1.50
41 Meeting Room J	1	17.2	Oct 1300	796	3.3	530.0	1.50
41 Meeting Room K	1	11.0	Oct 1300	510	2.2	317.0	1.61
41 Meeting Room NW	1	28.2	Jun 1700	1305	8.9	875.0	1.49
41 Meeting Room SW	1	31.8	Sep 1500	1475	8.9	875.0	1.69

Zone Sizing Summary for AHU-B-1,2,3

Project Name: Hearst Tower
Prepared by: psuae

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Air System Information

Air System Name **AHU-B-1,2,3**
Equipment Class ..... **CW AHU**
Air System Type ..... **VAV**
Number of zones **1**
Floor Area ..... **15141.0** ft²
Location ..... **New York La Guardia, New York**

Sizing Calculation Information

Zone and Space Sizing Method:

Zone CFM ..... **Peak zone sensible load**
Space CFM ..... **Individual peak space loads**
Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Air Flow (CFM)	Minimum Air Flow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft²)	Zone CFM/ft²
Zone 1	262.2	15307	153	Aug 1400	14.7	15141.0	1.01

Zone Terminal Sizing Data

Zone Name	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Coil Load (MBH)	Zone Htg Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	14.7	1.47	0.0	0.00	0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
1 Floor Main Lobby	1	9.7	Jan 2300	448	0.0	1275.0	0.35
1 Floor Reception	1	4.3	Jan 2300	198	0.0	675.0	0.29
1 Floor Security	1	2.3	Jan 2300	105	0.0	395.0	0.27
2 Kitchen Accesories	1	5.3	Jan 2300	248	0.0	913.0	0.27
2 Mens Locker Room	1	5.1	Jan 2300	236	0.0	210.0	1.12
2 Messenger Room	1	1.0	Jan 2300	48	0.0	180.0	0.27
2 Office 243	1	0.6	Jan 2300	29	0.0	90.0	0.33
2 Office 244	1	0.6	Jan 2300	29	0.0	90.0	0.33
2 Office 245	1	0.6	Jan 2300	29	0.0	90.0	0.33
2 Scanning Room	1	1.0	Jan 2300	48	0.0	180.0	0.27
2 Storage Room	1	2.3	Jul 0900	106	0.6	254.0	0.42
3 Cafeteria	1	157.2	Jul 0900	10560	9.7	6334.0	1.67
3 Servery	1	56.4	Oct 1300	3600	4.4	2150.0	1.67
3 Tower Lobby	1	17.8	Jan 2300	823	0.0	2305.0	0.36

Appendix D
HAP Annual Cost Results

Annual Cost Summary

Hearst Tower
psuae

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Table 1. Annual Costs

Component	Hearst Tower ($)
Air System Fans	515,890
Cooling	518,578
Heating	0
Pumps	11,307
Cooling Tower Fans	201,308
HVAC Sub-Total	**1,247,084**
Lights	1,782,377
Electric Equipment	0
Misc. Electric	0
Misc. Fuel Use	0
Non-HVAC Sub-Total	**1,782,377**
Grand Total	**3,029,461**

Table 2. Annual Cost per Unit Floor Area

Component	Hearst Tower ($/ft²)
Air System Fans	0.958
Cooling	0.963
Heating	0.000
Pumps	0.021
Cooling Tower Fans	0.374
HVAC Sub-Total	**2.317**
Lights	3.311
Electric Equipment	0.000
Misc. Electric	0.000
Misc. Fuel Use	0.000
Non-HVAC Sub-Total	**3.311**
Grand Total	**5.628**
Gross Floor Area (ft²)	538268.0
Conditioned Floor Area (ft²)	538268.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 3. Component Cost as a Percentage of Total Cost

Component	Hearst Tower (%)
Air System Fans	17.0
Cooling	17.1
Heating	0.0
Pumps	0.4
Cooling Tower Fans	6.6
HVAC Sub-Total	**41.2**
Lights	58.8
Electric Equipment	0.0
Misc. Electric	0.0
Misc. Fuel Use	0.0
Non-HVAC Sub-Total	**58.8**
Grand Total	**100.0**

Annual Energy and Emissions Summary

Table 1. Annual Costs

Component	Hearst Tower ($)
HVAC Components	
Electric	1,247,091
Natural Gas	0
Fuel Oil	0
Propane	0
Remote HW	0
Remote Steam	0
Remote CW	0
HVAC Sub-Total	**1,247,091**
Non-HVAC Components	
Electric	1,782,377
Natural Gas	0
Fuel Oil	0
Propane	0
Remote HW	0
Remote Steam	0
Non-HVAC Sub-Total	**1,782,377**
Grand Total	**3,029,468**

Table 2. Annual Energy Consumption

Component	Hearst Tower
HVAC Components	
Electric (kWh)	6,235,453
Natural Gas (na)	0
Fuel Oil (na)	0
Propane (na)	0
Remote HW (na)	0
Remote Steam ()	767,601
Remote CW (na)	0
Non-HVAC Components	
Electric (kWh)	8,911,884
Natural Gas (na)	0
Fuel Oil (na)	0
Propane (na)	0
Remote HW (na)	0
Remote Steam ()	0
Totals	
Electric (kWh)	15,147,340
Natural Gas (na)	0
Fuel Oil (na)	0
Propane (na)	0
Remote HW (na)	0
Remote Steam ()	767,601
Remote CW (na)	0

Table 3. Annual Emissions

Component	Hearst Tower
CO2 (lb)	0
SO2 (kg)	0
NOx (kg)	0

Table 4. Annual Cost per Unit Floor Area

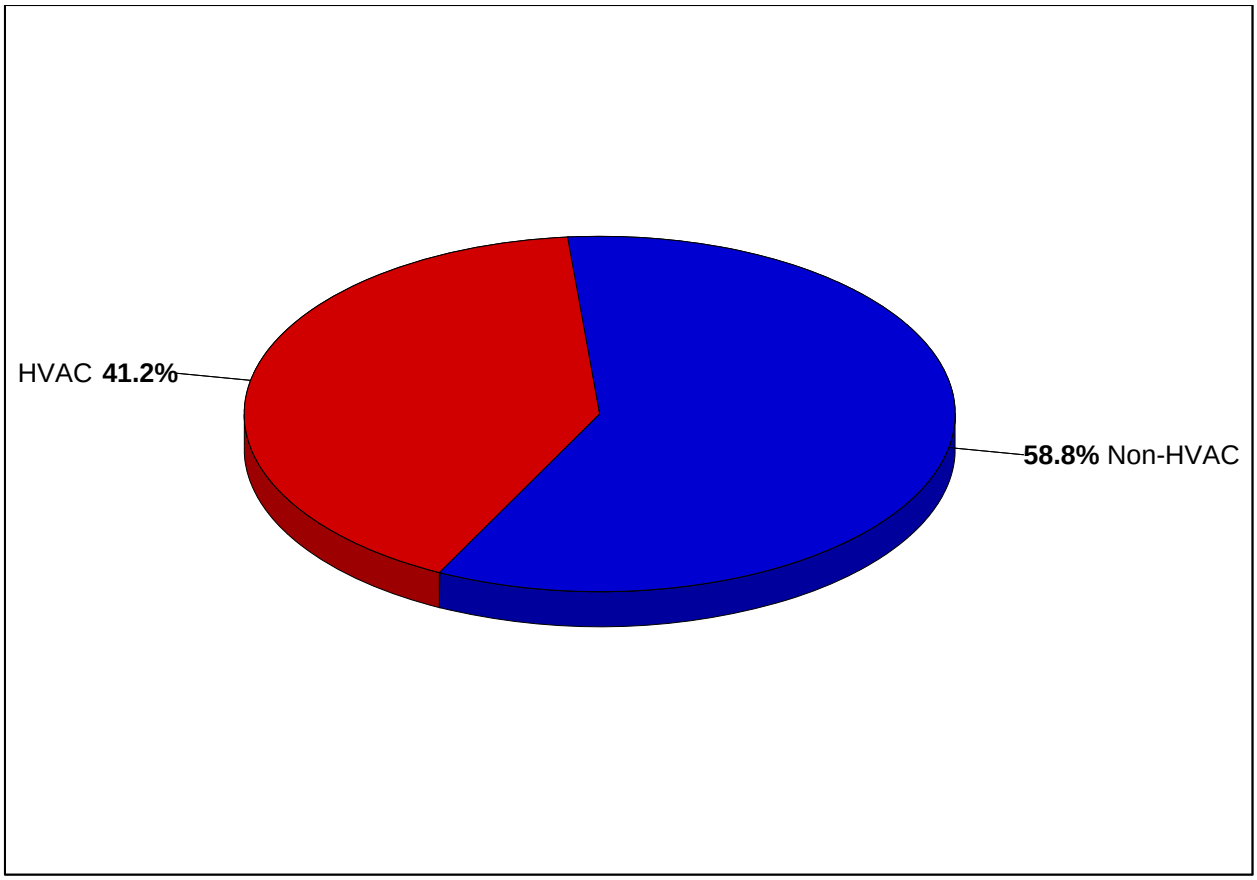
Component	Hearst Tower ($/ft²)
HVAC Components	
Electric	2.317
Natural Gas	0.000
Fuel Oil	0.000
Propane	0.000
Remote HW	0.000
Remote Steam	0.000
Remote CW	0.000
HVAC Sub-Total	**2.317**
Non-HVAC Components	
Electric	3.311
Natural Gas	0.000
Fuel Oil	0.000
Propane	0.000
Remote HW	0.000
Remote Steam	0.000
Non-HVAC Sub-Total	**3.311**
Grand Total	**5.628**
Gross Floor Area (ft²)	538268.0
Conditioned Floor Area (ft²)	538268.0

Note: Values in this table are calculated using the Gross Floor Area.

Table 5. Component Cost as a Percentage of Total Cost

Component	Hearst Tower (%)
HVAC Components	
Electric	41.2
Natural Gas	0.0
Fuel Oil	0.0
Propane	0.0
Remote HW	0.0
Remote Steam	0.0
Remote CW	0.0
HVAC Sub-Total	**41.2**
Non-HVAC Components	
Electric	58.8
Natural Gas	0.0
Fuel Oil	0.0
Propane	0.0
Remote HW	0.0
Remote Steam	0.0
Non-HVAC Sub-Total	**58.8**
Grand Total	**100.0**

Annual HVAC & Non-HVAC Cost Totals - Hearst Tower



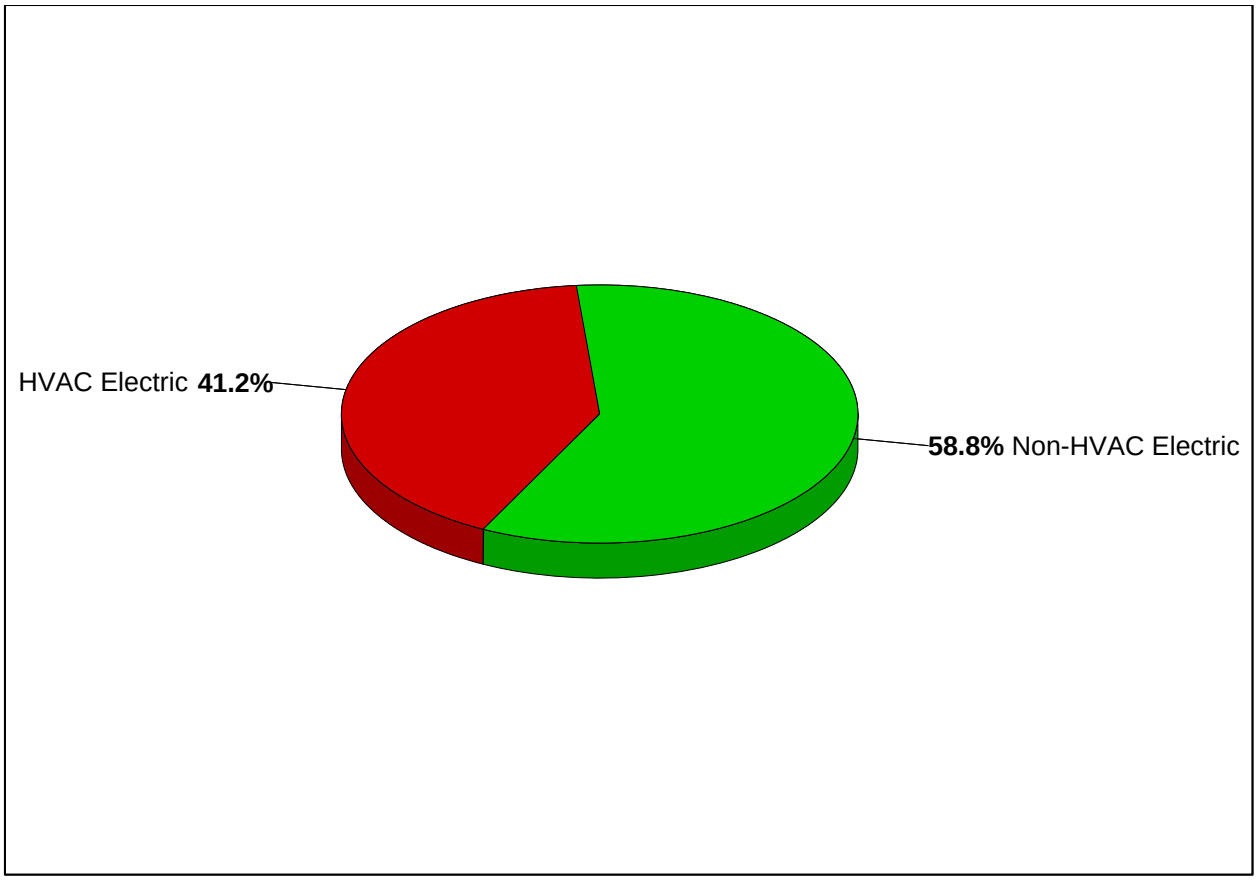
1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC	1,247,084	2.317	41.2
Non-HVAC	1,782,377	3.311	58.8
Grand Total	**3,029,461**	**5.628**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **538268.0** ft²
Conditioned Floor Area ..... **538268.0** ft²

Annual Energy Costs - Hearst Tower



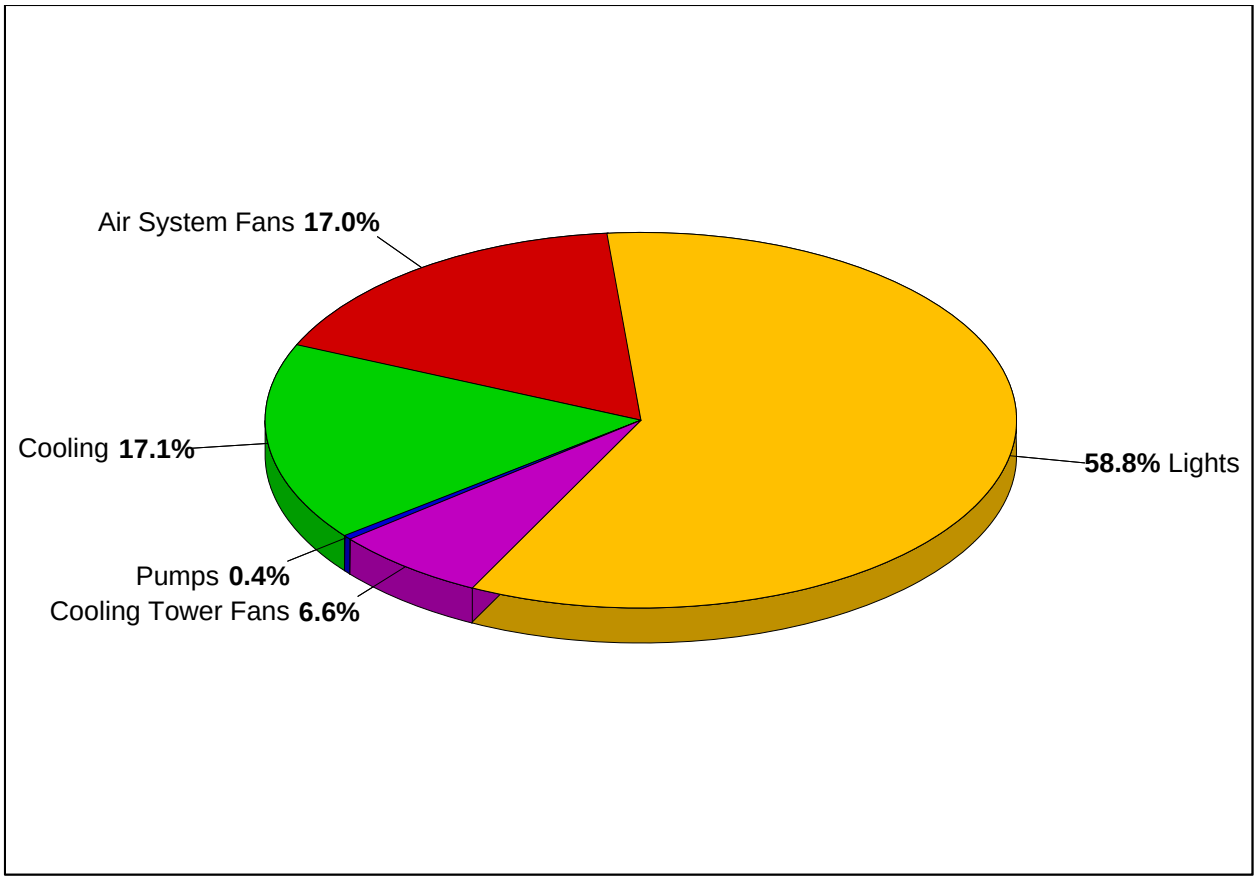
1. Annual Costs

Component	Annual Cost ($/yr)	($/ft²)	Percent of Total (%)
HVAC Components			
Electric	1,247,091	2.317	41.2
Natural Gas	0	0.000	0.0
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Remote Chilled Water	0	0.000	0.0
HVAC Sub-Total	**1,247,091**	**2.317**	**41.2**
Non-HVAC Components			
Electric	1,782,377	3.311	58.8
Natural Gas	0	0.000	0.0
Fuel Oil	0	0.000	0.0
Propane	0	0.000	0.0
Remote Hot Water	0	0.000	0.0
Remote Steam	0	0.000	0.0
Non-HVAC Sub-Total	**1,782,377**	**3.311**	**58.8**
Grand Total	**3,029,468**	**5.628**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **538268.0** ft²
Conditioned Floor Area ..... **538268.0** ft²

Annual Component Costs - Hearst Tower



1. Annual Costs

Component	Annual Cost ($)	($/ft²)	Percent of Total (%)
Air System Fans	515,890	0.958	17.0
Cooling	518,578	0.963	17.1
Heating	0	0.000	0.0
Pumps	11,307	0.021	0.4
Cooling Tower Fans	201,308	0.374	6.6
HVAC Sub-Total	**1,247,084**	**2.317**	**41.2**
Lights	1,782,377	3.311	58.8
Electric Equipment	0	0.000	0.0
Misc. Electric	0	0.000	0.0
Misc. Fuel Use	0	0.000	0.0
Non-HVAC Sub-Total	**1,782,377**	**3.311**	**58.8**
Grand Total	**3,029,461**	**5.628**	**100.0**

Note: Cost per unit floor area is based on the gross building floor area.

Gross Floor Area ..... **538268.0** ft²
Conditioned Floor Area ..... **538268.0** ft²

Appendix E
Emission vs. Primary Mix Spreadsheet

Estimating Emissions Associated with On-Site Electricity Use

U.S. Power Generation Mix

			Short Tons				lbm Pollutant$_j$ /kWh					Hearst Tower lbm Pollutant			
Fuel	**kWh(1999)**	**% Total**	**SO_2**	**NO_x**	**CO_2**		**Particulates**	**SO_2/kWh**	**NO_x/kWh**	**CO_2/kWh**		**SO_2**	**Nox**	**CO_2**	**Particulates**
Coal	1.77E+12	55.7	1.13E+07	6.55E+06	1.90E+09		1.10E-03	1.28E-02	7.41E-03	2.15E+00		1.94E+05	1.12E+05	3.26E+07	1.67E+04
Oil	8.69E+10	2.7	6.70E+05	1.23E+05	9.18E+07		1.10E-03	1.54E-02	2.83E-03	2.11E+00		2.33E+05	4.29E+04	3.20E+07	1.67E+04
Nat. Gas	2.96E+11	9.3	2.00E+03	3.76E+05	1.99E+08		0.00E+00	1.35E-05	2.54E-03	1.34E+00		2.04E+02	3.84E+04	2.03E+07	0.00E+00
Nuclear	7.25E+11	22.8	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydro/Wind	3.00E+11	9.4	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals	3.18E+12	100.0	1.20E+07	7.05E+06	2.19E+09		6.42E-04	7.54E-03	4.44E-03	1.38E+00		4.27E+05	1.94E+05	8.48E+07	3.33E+04

*For total HVAC&NonHVAC kWh = 15147340

Source: Electric Power Annual 1999, Vol.II, October 2000, DOE/EIA-0348(99)/2, Energy Information Administration, US DOE, Washington, D.C. 20585-065 http://www.eia.doe.gov/eneaf/electricity/epav2/epav2.pdf