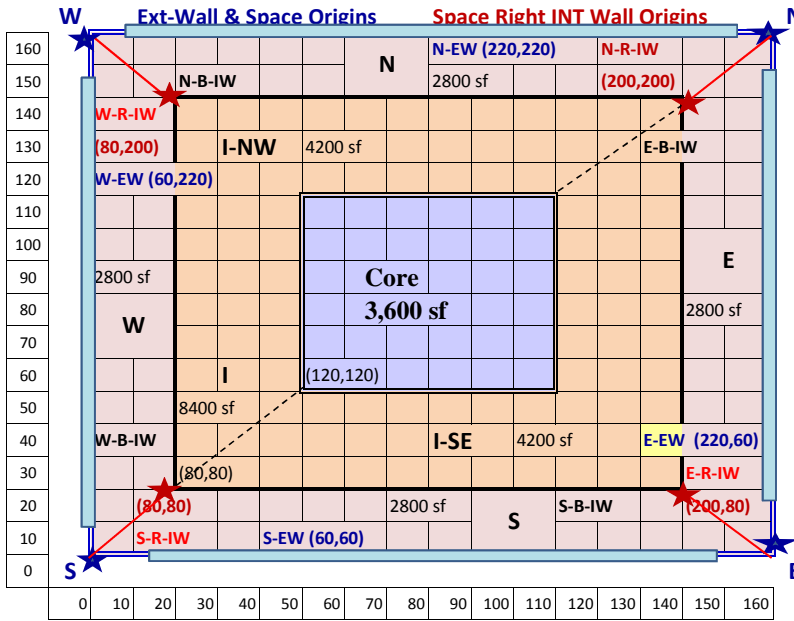


## Hotel Systems

**L13- L42 (30 Flrs) =  
Apartments  
Flr-Ht = 10'**

Level	Flr-Ht	Elev	Service		Level	Flr-Ht	Elev	Service	
B2	20	-30	Mech-Electr		L1	15	0	Lobby, Retail	
B1	10	-10	UG Parking		L2	15	0	Retail	
L4	20	110	Mech-Electr		L3	15	15, 30, 45	Htl Functions	
L36	20	445	Mech-Electr		L5-L34	10	130	Hotel-Rooms	
L37	*	465	Roof Clg-Twr		L35	15	430	Restaurant	

**L1 (Lobby) Flr-Flr-H = 15'**  
**L35 (Restaurant)**



### Walls Coordinates

	Exterior		Rgt Inter		Bck Inter	
	x	y	x	y	x	y
N	160	160	140	140	20	140
E	160	0	140	20	140	140
S	0	0	20	20	140	20
W	0	160	20	140	20	20

Floor to Floor Height (ft)	15
Floor to Ceiling Hght (ft)	10
Window Height (ft) per Wall	7
Window Length (ft) per Wall	140
Window Percent	45
Toilet Exhausts = 2000 cfm/floor	
General Exhausts = 1000 cfm/flr	

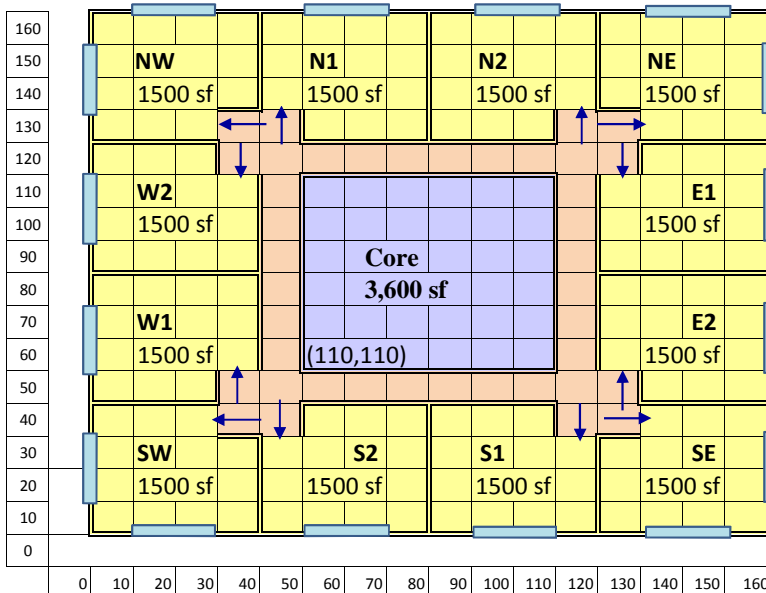
Windows/Wall = 140'W x 7'H = 980 sf

Wall Area = 160'W x 15.0'H = 2400 sf

X = 10 Y = 2.5

**Percent Window = 41%**

**Apartments (flrs 5 to 34 - 30 flrs) Flr-Flr-H = 10'**



### Exterior-Wall Coords and Origins

Zn #	Azim	Coords		Azim	Coords	
	Wall-1	x	y	Wall-2	x	y
NW	270-W	0	160	0-N	40	160
N1	0-N	80	160			
N2	0-N	120	160			
NE	0-N	160	120	90-E	160	120
E1	90-E	160	80			
E2	90-E	160	40			
SE	90-E	120	0	180-S	120	0
S1	180-S	80	0			
S2	180-S	40	0			
SW	180-S	0	0	270-W	0	40
W1	270-W	0	80			
W2	270-W	0	120			
CR						

Window: X = 5 Y = 3

### Exhaust (each apt.)

Kitchen (K) = 300 cfm      Sch-Ktchn  
Bathroom (B) = 200 cfm      Sch-Bthrm  
Laundry (L) = 100 cfm      Sch-Lndry  
Core (C) = 900 cm      Sch-Core

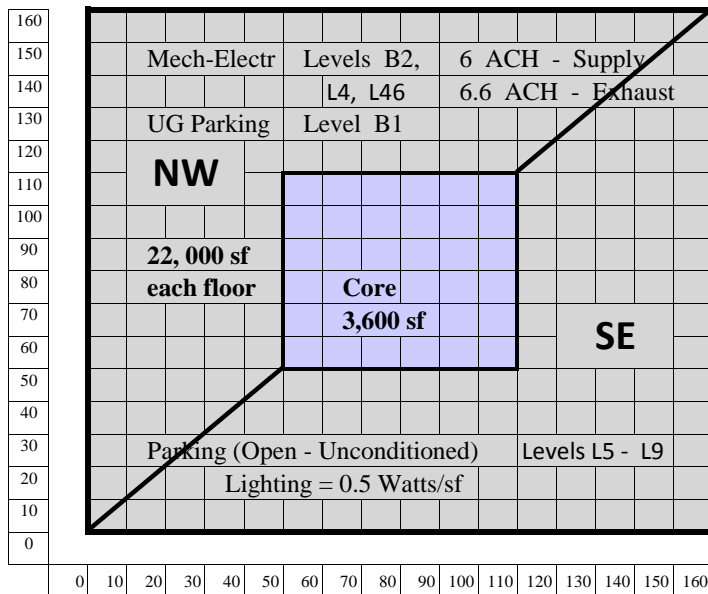
Flr-Clg Hgt = 9'. Flr-Flr-H = 10'.  
Core = 3,600 sf, Corridor = 4,000 sf  
12 Apts 1500 sf each, 18,000 sf total

### % Window (each apt.)

Wall = 40' x 10' = 400 sf  
Window = 30' x 5.5' = 165 sf

**Percent Window = 41%**

Indoor	DB Temp		Infl	Lighting		Equipment		Occupancy		Ventilation		Exhaust		
Design	Smmr	Wntr	cfm/sf	W/sf	Sch #	W/sf	Sch #	sf/Pers	Sch #	cfm/P	ACH	ACH	Cfm/sf	Sch #
Mech-Electr	*	60	1.00	1.5		3.0		600			6	6.6		
UG-Parking	*	*	*	0.5		0.0		*			6	6.6		
Lobby-Grnd	75	72	0.10	2.0		1.0		50		15			0.1	
Retail	75	72	0.05	3.0		3.0		50		15			0.2	
Htl-Functions	75	72	0.05	3.0		2.0		50		15			0.2	
Restaurant	75	72	0.10	2.0		1.0		50		15			0.3	
Apartments	75	75	0.05	0.5		0.5		500		30			0.1	
Corridors	78	70	0.00	0.5		0.0		900		15			0.1	

**Levels B2, L4 and L36 (Mech-Electr)****Flr-Flr-H = 20'****Levels B: L4-L8 (Parking-Open)****Flr-Flr-H = 10'****Hotel Functions**

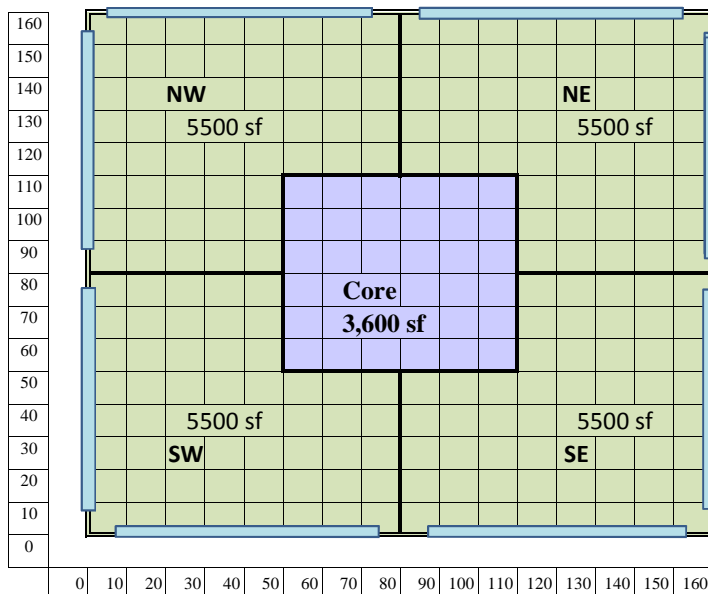
Fitness Center	Retail/Shops
Swimming Pool	Restaurant
Lockers/Toilets	Bar/Night-Club
Meeting Rooms	Kitchen
Ballroom	Laundry
Exhibition	Dry-Cleaners
Offices/Admin	Housekeeping

**L2 Hotel Retail**

Merchandise Display

**L3 Hotel Functions**

Restaurant Kitchen  
 Bar/Night-Club  
 Offices/Admin  
 Retail/Shops  
 Laundry Dry-Cleaners  
 Housekeeping  
 Fitness Center  
 Swimming Pool  
 Lockers/Toilets  
 Meeting Rooms  
 Exhibition  
 Ballroom

**Levels: L2 Retail L3 Hotel Functions****Flr-Flr-H = 15'****Exterior-Wall Coords and Origins**

Zone #	Azim	Coordinates		Azim	Coordinates	
	Wall-1	X	Y	Wall-2	X	Y
NW	270-W	0	160	0-N	80	160
NE	0-N	160	160	90-E	160	80
SE	90-E	160	0	180-S	80	0
SW	180-S	0	0	270-W	0	80

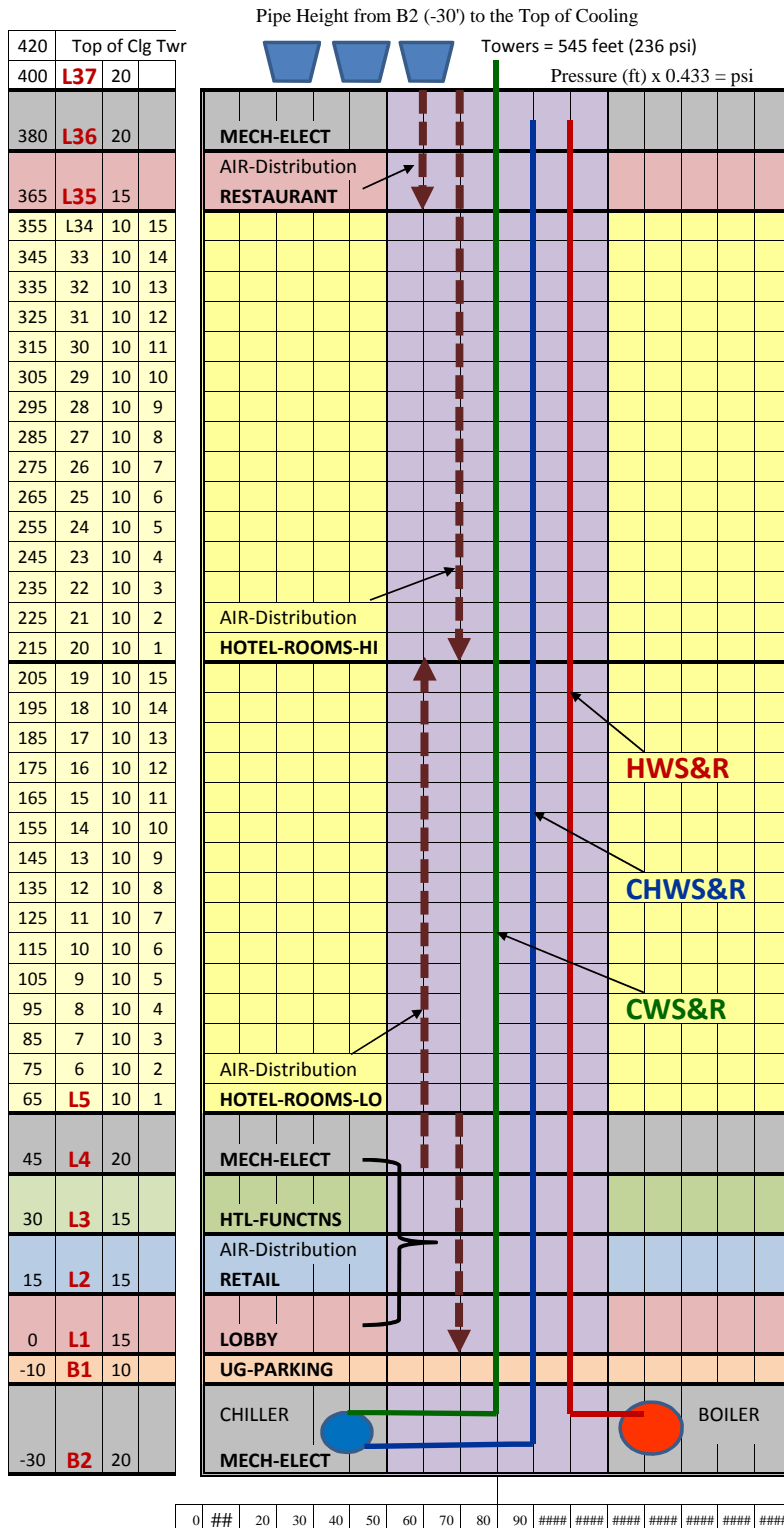
**% Window (each Zone) Coordinates**

Wall = 80' x 15' = 1,200 sf Y = 5 Y = 2

Window = 70' x 7' = 490 sf

**Percent Window = 41%**

## Hotel Systems



### Envelope

ROOF
STD90 U-Value = 0.064
Proposed U-Value = 0.056
3/8" Built-Up Roofing
2" HeavyWeight Concr
3" Polyurethane Insul
1/2" Ceiling Panel

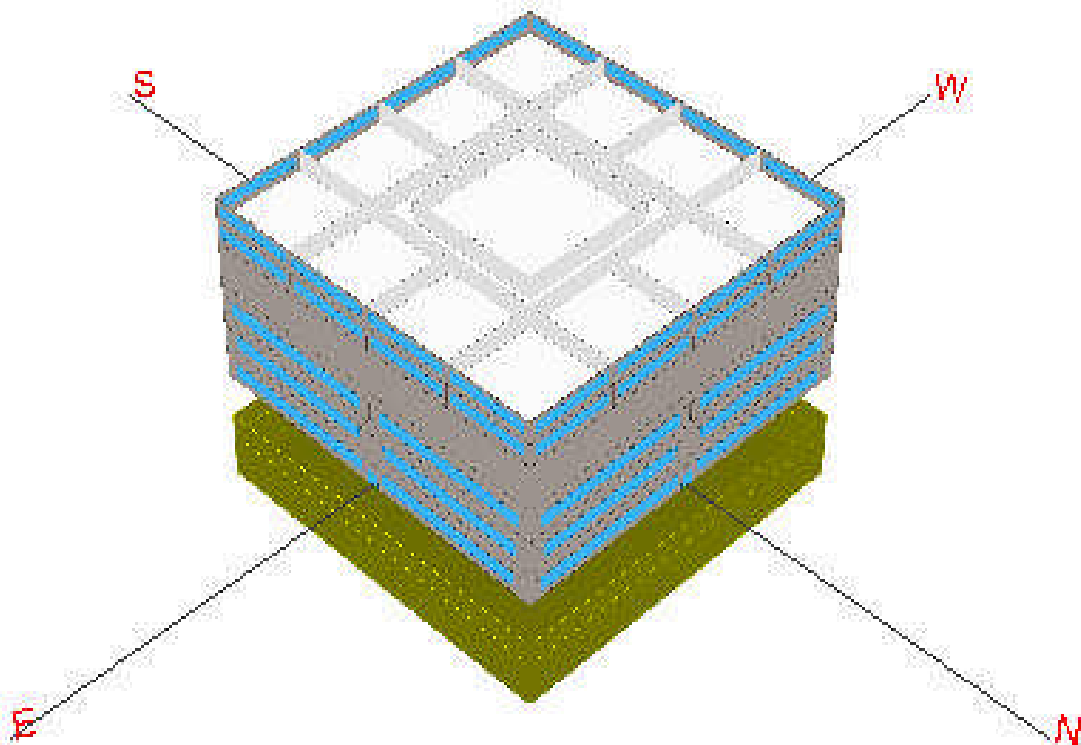
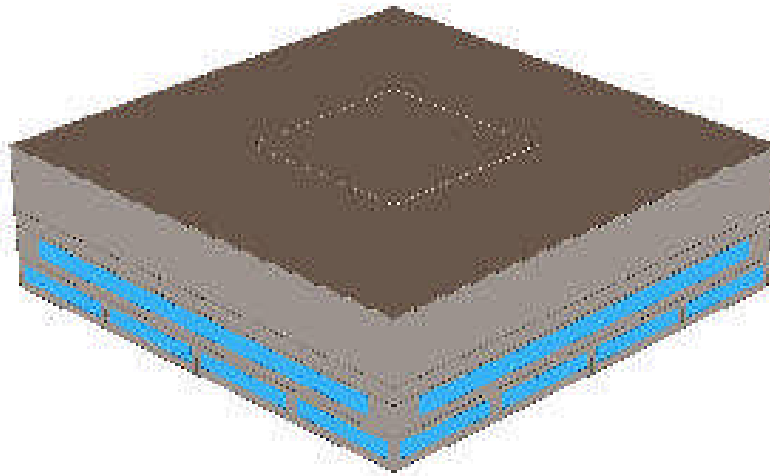
WALL
STD90 U-Value = 0.124
Proposed U-Value = 0.084
1/4" Spandrel Glass
2" Polystyrene Insul
1/2" Covering Material
1/2" Gypsum Board

GLASS	U	SC	VLT	DOE2
Lbby-Grnd	0.29	0.48	0.68	2664
Htl-Functns	0.23	0.32	0.41	2668
Restaurnt	0.23	0.32	0.41	2668
Htl-Rooms	0.23	0.32	0.41	2668

System		Hours		System		
Operation		Start	End	Type		
Mech-Elect		24 Hours		Ht + Vent		
UG-Parkng		24 Hours		Ventil		
Lbby-Grnd		24 Hours		VAVS+FPIU		
Htl-Functns		9 AM	11 PM	ACU, CW-Rj		
Restaurnt		6 AM	11 PM	VAVS+FPIU		
Apartment		24 Hours		Apt Sysrms		
Corridors		24 Hours		CV - OA		

System		Fan Static Pressure		
Operation		Sup	Ret	Exh
Mech-Elect		1.5	*	1.0
UG-Parkng		1.5	*	1.0
Lbby-Grnd		3.5	1.5	
Htl-Fnctns		3,5	1.5	
Restaurnt		3.5	1.5	
Apartment		See Apt Systems		
Corridors		3.0	*	

Apartment Systems	Fan
Distributed Systems per Unit	S.P.
1 - Pckgd Trmnl Unit (PTAC)	1.5
2 - 2-Pipe FCU + Elctrc-Basebd	0.5
3 - 2-Pipe FCU + HW-Basebd	0.5
4 - 4-Pipe FCU HW	0.7
3 - Dstrb CHW, OA to AHU/Flr	2.5
4 - Dstrbtd CW, OA to ACU/Flr	3.5
5 - WLHP, Ht-Rej to Clg-Twr	1.5



**PEPCO : Potomac Electric Power Company, Washington DC**  
**Year 2000**

Summer Rates: Jun 1 to Oct 31		Winter Rates : Nov 1 to May 31		
PEAK	Mon-Fri	12 Noon	8 PM	
INTERMED	Mon-Fri	8 AM	12 Noon	
		8 PM	12 Night	
OFF-PEAK	Mon-Fri	12 Night	8 AM	
	Sat, Sun, Hol	1 AM	12 Night	
Minim Charge per Month = \$ 20.93				

ENERGY CHARGE per KW		Peak	Intermed	Off-Peak
SUMMER	Distribution	0.01029	0.01029	0.01029
	Transmission	0.00219	0.00219	0.00219
	Generation	0.02253	0.02253	0.02253
	<b>TOTAL</b>	<b>0.03501</b>	<b>0.03501</b>	<b>0.03501</b>
ENERGY CHARGE per KW		Peak	Intermed	Off-Peak
WINTER	Distribution	0.01029	0.01029	0.01029
	Transmission	0.00219	0.00219	0.00219
	Generation	0.02110	0.02110	0.02110
	<b>TOTAL</b>	<b>0.03358</b>	<b>0.03358</b>	<b>0.03358</b>
DEMAND CHARGE per KW		Peak	Intermed	Off-Peak
SUMMER	Distribution	4.80	4.80	4.80
	Transmission	0.71	0.59	0.59
	Generation	10.41	3.70	3.70
	<b>TOTAL</b>	<b>15.92</b>	<b>9.09</b>	<b>9.09</b>
DEMAND CHARGE per KW		Peak	Intermed	Off-Peak
WINTER	Distribution	4.80	4.80	4.80
	Transmission	0.71	0.59	0.59
	Generation	10.41	3.70	3.70
	<b>TOTAL</b>	<b>15.92</b>	<b>9.09</b>	<b>9.09</b>

**Washington Gas & Light Co.**

Minimum Monthly Charge = \$25					
Summer Rates: Jun 1 to Oct 31					
Balance Charge \$/therm = \$0.00					
Winter Rates : Nov 1 to May 31					
Balance Charge \$/therm = \$0.0741					
2000	Cost		2001	Cost	
Mon	\$/th	\$m3	Mon	\$/th	\$/m3
Jan	0.78	0.27	Jul	0.64	0.23
Feb	0.75	0.26	Aug	0.64	0.23
Mar	0.69	0.25	Sep	0.52	0.18
Apr	0.78	0.28	Oct	0.52	0.18
May	0.78	0.28	Nov	0.52	0.18
Jun	0.64	0.23	Dec	0.58	0.20

**Steam Rates for New York**

Consolidated Edison, General Service				
Min Charge / Month \$367.78, 125 psig				
Time of Use : All hours of the year				
Usage Range		k-lb	\$/k-lb	\$/kg
For the first		20	7.5	0.017
For the next		30	19.8	0.044
For the next		950	15.8	0.035
For excess over		1000	15.3	0.034

**Washington Water & Sewer**

DC	\$/ft3	\$/M3
Water	0.0179	0.632
Sewer	0.0271	0.957

**Beijing Utility Rates**

<b>Building Area =</b>		454,133	
<b>Exchange Rate</b>			
	\$ 1.00 to RMB =	8.1	
<b>District Hot Water</b>			
	Ht 250F-140F	110	
	RMB /m2/ yr =	30	
	RMB / Year =	1,265,669	
	\$ / Yr =	156,255	
	m3 / Yr =	30,824	
	Avg \$ / m3 =	5.07	
	\$ / 1000 lbs =	2.30	
<b>Natural Gas</b>			
	RMB / m3 =	1.7	
	\$ / m3 =	0.21	
	\$ / therm =	0.59	
<b>Electricity</b>			
	RMB / kwh =	0.597	
	\$ / kwh =	0.07	
<b>Water &amp; Sewer</b>			
RMB/T	\$/M-Ton	\$/ft3	\$/M3
2.4	0.2963	0.0084	0.29630
0.8	0.0988	0.0028	0.09877

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