

AKF



Note about comments from ECC Audit completed 7.7.15

Comments on the following Energy Model pages reference a review of the 6.05.15 drawing set. Revise drawings and model as noted and e-file complete revised drawing set as "Energy Audit Responses"

eQuest model files shall be submitted directly via email to the assigned sustainability plan examiner at:
bkahle@buildings.nyc.gov

217 West 57th Street
New York, NY
Energy Code Compliance Objections Response

Resolved - 7.7.15

1. Energy Code Review Comment (Page 1, Page 3 (drawing A-801)):

1 RCNY §5000-01(g)-Provide building thermal envelope summary for each elevation. Summary shall document wall type label, Surface Area and Thermal Performance (U-factor/R-value/SHGC) for all above & below grade wall, slab/floor heat loss conditions, roof, floors/slabs and fenestration types that is part of the exterior thermal envelope for proposed project.

The summary information shall be coordinated with provided Energy Analysis reports.

All building envelope components listed shall have a corresponding wall detail/section, window/door schedule specifying thermal performance properties to confirm R-values and U-factors listed in building envelope summary table.

Insufficient support documentation for NYCECC review.

Comment Response:

Detail has been added to architectural drawing, A090. The average construction U-values match the average U-values in the energy model and in the energy model form on the EN-100 drawing as can be seen in the below summary of the average U-value resulting from the spec.

BUILDING ENVELOPE - SUMMARY ELEVATION					
ID	CONST MATERIAL	AREA	% OF TOTAL	U-VALUE	SHGC
A	GLAZING VISION (IGU)	252,473	35%	0.37	0.35
B	GLAZING SPANDREL (IGU)	193,175	27%	0.05	0
C	ARCH METAL PANEL (INSULATED)	176,085	24%	0.05	0
D	PODIUM METAL PANEL (INSULATED)	2,070	0%	0.07	0
E	AIR WELL LOUVER (NON-ACTIVE)	4,570	1%	0.1	0
F	LOUVER (ACTIVE)	5,834	1%	12	0
G	RETAIL GLAZING VISION (IGU)	30,283	4%	0.31	0.6
H	RETAIL GLAZING VISION (STORE FRONT)	2,793	0%	0.95	0.8
J1	ADJACENT BUILDING WALL AREA (LOT LINE)	6,647	1%	0.35	0
J2	ADJACENT BUILDING WALL AREA (LOT LINE)	627	0%	0.63	-
J3	ADJACENT BUILDING WALL AREA (LOT LINE)	17,496	2%	0.43	-
J4	ADJACENT BUILDING WALL AREA (LOT LINE)	14,334	2%	0.35	-
J5	ADJACENT BUILDING WALL AREA (LOT LINE)	1,056	0%	0.27	-
J6	ADJACENT BUILDING WALL AREA (LOT LINE)	748	0%	0.2	-
J7	ADJACENT BUILDING WALL AREA (LOT LINE)	4,591	1%	0.09	-
K	LANDMARK RECONSTRUCTION WALL AREA	2,739	0%	0.08	0
L	LANDMARK RECONSTRUCTION WINDOW AREA	107	0%	0.95	0.8
M	LANDMARK WALL AREA	4,858	1%	0.5	0
N	LANDMARK WINDOW AREA	3,139	0%	0.95	0.8
P	BELOW GRADE (WALLS 100% BELOW GRADE)	58,252		N/R	N/R
TOTALS		AREA	% OF TOTAL	AVERAGE U-VALUE	AVERAGE SHGC
ALL GLASS		288,795	39.9%	0.376	0.386
ALL WALLS		434,830	60.1%	0.088	
TOTAL ABOVE-GRADE		723,625	100%	-	-
TOTAL ROOF		45,691	100%	0.05	-

Envelope areas from architectural drawing take-offs match closely the output from the energy model report (LV-D). Small discrepancies between model output and architectural take-offs are expected based on the eQUEST modelling input procedure. All areas are within ~1% of the LV-D report and Architectural take-offs, well within standard modelling protocol.

The building has used a performance spec; the U-values and SHGC listed on the documents are as per the performance specification (included as an appendix to this comment response) and as provided on drawing A-090.

Resolved - 7.7.15

2. Energy Code Review Comment (Page 1):

Per energy model report proposed project has 38% glazing. Provide sufficient support documentation to match Energy Analysis. Please refer to documentation requirements per 1 RCNY §5000-01.

Comment Response:

Architectural drawing A-090 has been updated to show detailed area breakdowns of the wall and window areas. These areas are consistent with the modelled areas seen in the LV-D output report. The envelope areas have been updated to match the updated filing set, and now show 39% glazing in both the A-090 backup and the energy model.

Partially Resolved - 7.7.15 See notes below

3. Energy Code Review Comment (Page 2, Page 3 (drawing G-001)):

1 RCNY §5000-01(f) - Incomplete submission.

Missing EN dwg: on EN dwg provide the following:

Resolved 1) EN-1 form for energy model!

2) tr8 inspections Partially Resolved - verify all inspections on drawing checked "yes" match TR8

Resolved 3) professional statement

Provide the following support documentation for review with Energy Model

Resolved 4) complete support documentation for building envelope as mark-up

5) lighting connected power information to support savings as indicated in energy model.

Partially Resolved - see notes in model reports regarding LPD.

Resolved 6) completed MEP drawings showing proposed equipment with efficiency ratings as shown in energy model.

Energy Code Compliance review pending until full submission is provided.

Comment Response:

Drawing EN-100 has been submitted. EN-100 drawing includes signed EN-1 form, tr8 inspections list, and professional statement.

In addition, the envelope supporting documentation has been provided as part of the Architectural Drawings A-090, as well as the attached section of the Curtain Wall Specifications as seen in the appendix of this report.

The lighting power density calculations and lighting fixture schedules have been provided as supporting information to the lighting connected power load.

The Mechanical drawings show the specified efficiency ratings of the equipment at rated conditions and at operating conditions where available. The scheduled efficiencies are as modelled, except where the modelled efficiency input is adjusted to separate fan power as required by ASHRAE 90.1-2007 section 11.3.2 c.

Resolved - 7.7.15

4. Energy Code Review Comment (Page 3 (drawing A-801)):

ECC 502.4 - Drawings do not specify mandatory provisions for air leakage, including where applicable, outdoor air intake and exhaust dampers, loading dock weatherseals, vestibules and recessed lighting seals where lighting is in the thermal envelope. Provide notes.

Comment Response:

Air infiltration requirements have been included in specifications. The infiltration requirements have been added as notes to drawing A-021.

Resolved - 7.7.15

5. Energy Code Review Comment (Page 3 (drawing A-801)):

ECC 502.4.2 Curtain wall, storefront glazing and commercial-glazed swinging entrance doors and revolving doors shall be tested for air leakage at 1.57 pounds per square foot (psf) (75 Pa) in accordance with ASTM E283. For curtain walls and storefront glazing, the max. air leakage rate shall be 0.3 cubic foot per minute per square foot (cfm/ft2) (5.5 m3/h x m2) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cfm/ft2 (18.3 m3/h x m2) of door

area when tested in accordance with ASTM E 283. Provide specification.

Comment Response:

Air infiltration requirements have been included in specifications. The infiltration requirements have been added as notes to drawing A-021.

Resolved - 7.7.15

6. Energy Code Review Comment (Page 4 (drawing A-801)):
ECC 502.4.1 Air leakage of window/door assemblies shall be determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed 0.3 cfm per square foot (1.5 L/s/m²), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m²). Provide Notes.

Comment Response:

Air infiltration requirements have been included in specifications. The infiltration requirements have been added as notes to drawing A-021.

Partially Resolved - 7.7.15 See notes below

7. Energy Code Review Comment (Page 4 (drawing A-802)):
1 RCNY §5000-01(g) (1) - Specify thermal properties for proposed construction. For all exterior envelope details/sections/assemblies provided throughout drawing set: specify R-values, insulation type & thickness, metal/wood stud size and spacing, and other pertinent thermal properties to match provided Energy Analysis. Derate for thermal bridging where applicable.

Comment Response:

The building envelope performance spec U-values and SHGC are listed on the documents (A-090) and in the specification sections provided as an appendix to this comment response document.

Resolved - 7.7.15

8. Energy Code Review Comment (Page 4 (drawing A-802)):
ASHRAE 90.1-2010 Appendix A1.1 – Use Pre-calculated assembly U-factors, C-factors and heat capacities for typical construction assemblies are included in Sections A2 through A8. These values shall be used for all calculations unless otherwise allowed by Section A1.2

Comment Response:

Appendix A1.1 has been used to determine the U-values of the concrete wall sections as per the below summary. All other envelope areas are based on a performance specification as per the above.

From Table A3.1A – CMU with cores filled with insulation:

- 8" CMU grouted with 4" insulation = R 20: U-0.35
- 12" CMU grouted with 4" insulation = R 20: U-0.35

Extrapolated from Table A3.1B – Density 144 lb/ft³ :

- 1'0" Concrete – U-0.63
- 1'-8" Concrete – U-0.43
- 2' Concrete – U-0.35
- 2'-6" Concrete – U-0.27
- 3' Concrete – U-0.20
- 4'-6" Concrete – U-0.09

Partially Resolved - 7.7.15 See notes below

9. Energy Code Review Comment (Page 4 (drawing A-803)):
1 RCNY §5000-01(g) (1) - Specify thermal properties for proposed construction. For all exterior envelope details/sections/assemblies provided throughout drawing set: specify R-values, insulation type & thickness, metal/wood stud size and spacing, and other pertinent thermal properties to match provided Energy Analysis. Derate for thermal bridging where applicable.

Comment Response: On all detail sheets, (A-800 series) where insulation is indicated as part of the thermal envelope, provide notes or a schedule showing insulation type, thickness and R-value to match values in Energy Analysis.

The building envelope performance spec U-values and SHGC listed on the documents (A-090) are as per the performance specification. Details of the wall sections can be found in the A-800 series drawings submitted

to DOB.

Resolved - 7.7.15

- 10.** Energy Code Review Comment (Page 4 (drawing A-802)):
ASHRAE 90.1-2010 Appendix A1.1 – Use Pre-calculated assembly U-factors, C-factors and heat capacities for typical construction assemblies are included in Sections A2 through A8. These values shall be used for all calculations unless otherwise allowed by Section A1.2

Comment Response:

Appendix A1.1 has been used to determine the U-values of the concrete wall sections as per the summary provided above. All other envelope areas are based on a performance specification as per the above.

- 2.12.5.1. Two lites of glass bonded to a 1/16 inch minimum thickness clear, puncture-resistant thermoplastic interlayer.
- 2.12.5.2. Laminated glass shall meet the minimum requirements of ASTM C1172.
- 2.12.5.3. Interlayer shall be compatible with all glazing sealants.
- 2.12.5.4. Offset of glass edges at heat-treated laminated glass assemblies intended to be in alignment to be limited to 1/8 inch. Edge of laminated annealed glass to be ground and polished after lamination.
- 2.12.5.5. Laminated safety glass assemblies shall meet the requirements for safety glazing of CPSC standard 16 CFR 1201, Category II.
- 2.12.5.6. Manufacturer shall warrant that the laminated glass will not develop edge separation or other defects which may affect the structural integrity of the glass assembly or otherwise compromise the requirements of the glass for a period of ten [10] years.

2.12.6. Low-E Coated Glass:

- 2.12.6.1. Low-emissivity coating[s] shall be neutral in transmitted and reflected color and otherwise exhibit the visual and performance characteristics of the products specified herein.
- 2.12.6.2. Low-E coatings shall be applied through the MSVD [magnetic sputter vacuum deposition] process.
- 2.12.6.3. Visual quality control acceptance criteria of the low-E coating shall be consistent with industry guidelines, subject to approval of the Architectural Design Team:
 - 2.12.6.3.1. Pinholes with diameters in excess of 1/16 inch are not acceptable.
 - 2.12.6.3.2. Scratches no longer than 3 inches in length are acceptable provided that they occur within 3 inches of an edge.
 - 2.12.6.3.3. Clusters of pinholes are not acceptable.
- 2.12.6.4. Manufacturer shall warrant that the low-E coating will not crack, peel, fade or deteriorate for a period of ten [10] years.

2.12.7. Glass Products:

- 2.12.7.1. Insulated Bent Glass: Clear low-iron glass for use in an insulated assembly.
 - 2.12.7.1.1. Performance characteristics GL-51 [see Glass Schedule for make-up, Section 2.12.10] to be equal or better than the following:
 - 2.12.7.1.1.1.1. Reflected light: 15 percent [maximum]
 - 2.12.7.1.1.1.2. U-Value [Winter]: **0.31** btu-in/hr-sq ft F [maximum]
 - 2.12.7.1.1.1.3. **Shading heat gain coefficient: 0.60 [maximum]**
- 2.12.7.2. **Insulated Glass:**
 - 2.12.7.2.1. **Performance characteristics GL-54 [see Glass Schedule for make-up, Section 2.12.10] to be equal or better than the following:**



Worst case performance for Retail Glazing (IGU), used for energy model.

03

03

Back of House Fixtures		
Fixture Tag	Watts/Fixture	Qty
A1a	59.0	589
A2a	56.0	641
A2b	28.0	149
A3a	45.6	136
A3b	45.6	185
A4b	22.8	129
A5	40.0	33
A6	15.0	20
A7	172.0	88
A8	0.8	67
Total BOH Watts		109,207
Total BOH Model Area (sf)		124,054
Model w/sf		0.88

ECC 505- Electrical Power and Lighting Systems

Provide notes and narratives where applicable on the drawing set to show compliance with all mandatory provisions for interior and exterior fixtures, lighting controls, sensors and dimming systems.

For non-public, residential portions of this building, note compliance by way of ECC 505.5.3. Provide a note to specify min. 50% high efficacy lamps in construction drawings and state compliance on "EN" drawing.

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REPORT- LV-B Summary of Spaces

WEATHER FILE- New York CityNY TMY2

(CONTINUED)

CSSW Perim Spc (B.SSW7)	1.0	INT	0.0	4.20	40.7	2.30	NO-INFILT.	0.00	2033.3	35581.9
CESE Perim Spc (B.ESE8)	1.0	INT	-90.0	0.88	54.1	0.25	NO-INFILT.	0.00	2705.3	47341.9
CCore Spc (B.C9)	1.0	INT	0.0	4.20	173.1	2.30	NO-INFILT.	0.00	8653.2	151431.2
CCore Spc (B.C10)	1.0	INT	0.0	4.20	21.5	2.30	NO-INFILT.	0.00	1076.2	18833.8
CCore Spc (B.C11)	1.0	INT	0.0	4.20	114.7	2.30	NO-INFILT.	0.00	5737.3	100402.5

Spaces on floor: GGround Flr

GNW Perim Spc (G.NW1)	1.0	EXT	90.0	4.20	18.9	2.30	AIR-CHANGE	0.20	946.4	14196.0
GNW Perim Spc (G.NW2)	1.0	EXT	45.0	0.88	53.7	0.25	AIR-CHANGE	0.04	2684.9	40273.1
GNNE Perim Spc (G.NNE3)	1.0	EXT	33.3	4.20	24.6	2.30	AIR-CHANGE	0.16	1231.5	18472.2
GSSW Perim Spc (G.SSW4)	1.0	EXT	0.0	4.20	7.3	2.30	AIR-CHANGE	0.15	367.5	5512.5
GWest Perim Spc (G.W5)	1.0	EXT	90.0	4.20	16.8	2.30	AIR-CHANGE	0.11	837.8	12566.3
GEast Perim Spc (G.E6)	1.0	EXT	135.0	4.20	18.3	2.30	AIR-CHANGE	0.15	917.2	13757.5
GNNE Perim Spc (G.NNE7)	1.0	EXT	180.0	4.20	62.8	2.30	AIR-CHANGE	0.04	3191.1	47866.2
GWest Perim Spc (G.W8)	1.0	EXT	66.6	4.20	9.8	2.30	AIR-CHANGE	0.23	488.1	7321.6
GSSW Perim Spc (G.SSW9)	1.0	EXT	0.0	4.20	20.0	2.30	AIR-CHANGE	0.16	998.6	14979.4
GESE Perim Spc (G.ESE10)	1.0	EXT	-90.0	4.20	9.0	2.30	AIR-CHANGE	0.11	449.1	6736.8
GESE Perim Spc (G.ESE11)	1.0	EXT	0.0	4.20	46.1	2.30	AIR-CHANGE	0.13	2304.7	34571.2
GSSW Perim Spc (G.SSW12)	1.0	EXT	0.0	4.20	32.4	2.30	AIR-CHANGE	0.17	1871.3	28068.8
GCore Spc (G.C13)	1.0	INT	0.0	4.20	62.9	2.30	AIR-CHANGE	0.00	3143.8	47157.0
GCore Spc (G.C14)	1.0	INT	0.0	4.20	11.6	2.30	AIR-CHANGE	0.00	581.2	8717.6
GNNE Perim Spc (G.NNE15)	1.0	EXT	-90.0	4.20	43.7	2.30	AIR-CHANGE	0.08	2182.5	32737.5
GCore Spc (G.C16)	1.0	INT	0.0	4.20	87.5	2.30	AIR-CHANGE	0.00	4376.0	65640.7
GCore Spc (G.C17)	1.0	INT	0.0	4.20	152.4	2.30	AIR-CHANGE	0.00	7621.7	114325.0
GPlnm (G.18)	1.0	EXT	0.0	2.50	0.0	0.00	AIR-CHANGE	0.06	34193.8	68387.5

Spaces on floor: 1MGround Flr

1MNW Perim Spc (G.NW1)	1.0	EXT	90.0	4.20	20.3	2.30	AIR-CHANGE	0.19	1014.0	8112.0
1MNorth Perim Spc (G.N2)	1.0	EXT	180.0	4.20	42.1	2.30	AIR-CHANGE	0.15	2105.3	16842.0
1MSW Perim Spc (G.SW3)	1.0	EXT	66.6	4.20	30.1	2.30	AIR-CHANGE	0.18	1506.9	12055.1
1MSW Perim Spc (G.SW4)	1.0	EXT	90.0	4.20	22.7	2.30	AIR-CHANGE	0.12	1134.8	9078.0
1MSSW Perim Spc (G.SSW5)	1.0	EXT	0.0	4.20	45.0	2.30	AIR-CHANGE	0.17	2247.8	17982.0
1MNNE Perim Spc (G.NNE6)	1.0	EXT	180.0	4.20	44.2	2.30	AIR-CHANGE	0.16	2210.3	17682.0
1MESE Perim Spc (G.ESE7)	1.0	EXT	135.0	4.20	54.1	2.30	AIR-CHANGE	0.16	2704.8	21638.4
1MCore Spc (G.C8)	1.0	INT	0.0	0.88	60.6	0.25	AIR-CHANGE	0.01	3032.1	24256.5
1MCore Spc (G.C9)	1.0	INT	0.0	4.20	28.0	2.30	AIR-CHANGE	0.01	1399.3	11194.6
1MCore Spc (G.C10)	1.0	INT	0.0	0.88	85.4	0.25	AIR-CHANGE	0.01	4420.3	35362.6
1MCore Spc (G.C11)	1.0	INT	0.0	4.20	287.0	2.30	AIR-CHANGE	0.01	14350.5	114804.3

Spaces on floor: 25Ground Flr

25NW Perim Spc (G.NW1)	1.0	EXT	90.0	4.20	20.3	2.30	AIR-CHANGE	0.19	1014.0	17745.0
25North Perim Spc (G.N2)	1.0	EXT	180.0	4.20	42.1	2.30	AIR-CHANGE	0.15	2105.3	36841.9
25SSW Perim Spc (G.SSW3)	1.0	EXT	0.0	4.20	7.3	2.30	AIR-CHANGE	0.15	367.5	6431.3
25West Perim Spc (G.W4)	1.0	EXT	90.0	4.20	16.8	2.30	AIR-CHANGE	0.11	837.8	14660.6
25SSW Perim Spc (G.SSW5)	1.0	EXT	0.0	3.70	44.0	2.30	AIR-CHANGE	0.18	2197.5	38456.3
25Core Spc (G.C6)	1.0	INT	0.0	4.20	115.6	2.30	AIR-CHANGE	0.00	5780.4	101157.4
25West Perim Spc (G.W7)	1.0	EXT	66.6	4.20	9.8	2.30	AIR-CHANGE	0.23	488.1	8541.8
25SSW Perim Spc (G.SSW8)	1.0	EXT	0.0	4.20	20.0	2.30	AIR-CHANGE	0.16	998.6	17475.9
25ESE Perim Spc (G.ESE9)	1.0	EXT	135.0	4.20	29.8	2.30	AIR-CHANGE	0.16	1491.1	26094.6
25ESE Perim Spc (G.ESE10)	1.0	EXT	-90.0	4.20	24.3	2.30	AIR-CHANGE	0.17	1214.3	21249.4
25NNE Perim Spc (G.NNE11)	1.0	EXT	90.0	4.20	32.6	2.30	AIR-CHANGE	0.15	1631.3	28546.9
25NNE Perim Spc (G.NNE12)	1.0	EXT	180.0	4.20	11.6	2.30	AIR-CHANGE	0.18	579.0	10132.5
25Core Spc (G.C13)	1.0	INT	0.0	4.20	25.2	2.30	AIR-CHANGE	0.00	1161.6	20327.7
25Core Spc (G.C14)	1.0	INT	0.0	4.20	33.9	2.30	AIR-CHANGE	0.00	1696.5	29688.8

REPORT- BEPS Building Energy Performance

WEATHER FILE- New York CityNY TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY MBTU	246.9	106.3	92.4	135.6	780.5	52.0	699.7	3521.7	973.3	0.0	179.8	521.8	7309.9
EM2- ELECTRICITY MBTU	8285.0	11325.2	8242.9	1.4	6659.2	0.0	0.0	2568.5	0.0	0.0	0.0	0.0	37082.2
EM3- ELECTRICITY MBTU	3744.4	4.0	1352.4	15.4	5994.2	0.0	0.0	424.8	0.0	0.0	0.0	0.0	11535.3
DM1 ELECTRICITY MBTU	0.0	0.0	2352.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2352.4
EM4 ELECTRICITY MBTU	0.0	0.0	0.0	0.0	0.0	0.0	108.3	0.0	0.0	0.0	0.0	0.0	108.3
EM5 ELECTRICITY MBTU	0.0	0.0	0.0	0.0	0.0	0.0	10228.5	0.0	0.0	0.0	0.0	0.0	10228.5
FM1 NATURAL-GAS MBTU	478.5	208.5	1919.8	10395.0	958.7	64.4	1171.7	7447.3	1601.5	0.0	325.5	1352.9	25923.8
MBTU	12754.9	11644.1	13959.9	10547.4	14392.6	116.4	12208.2	13962.3	2574.8	0.0	505.2	1874.7	94540.5



TOTAL SITE ENERGY 94540.55 MBTU 84.4 KBTU/SQFT-YR GROSS-AREA 84.4 KBTU/SQFT-YR NET-AREA
 TOTAL SOURCE ENERGY 231774.32 MBTU 207.0 KBTU/SQFT-YR GROSS-AREA 207.0 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.15
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
 HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 135
 HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 141

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

REPORT- PV-A Plant Design Parameters

WEATHER FILE- New York CityNY TMY2

----- (CONTINUED) -----

__SHW DHW 11	0.000	5.8	21.6	0.0	0.00	0.0	0.00	8.7	1.00
-0.204									

__SHW DHW 7	0.000	5.8	21.6	0.0	0.00	0.0	0.00	8.7	1.00
-0.204									

*** PUMPS ***

ATTACHED TO

FLOW
(GAL/MIN)HEAD
(FT)HEAD
SETPOINT
(FT)CAPACITY
CONTROLPOWER
(KW)MECHANICAL
EFFICIENCY
(FRAC)MOTOR
EFFICIENCY
(FRAC)

Res PCW Pump	4 PUMP (s)								
Res PCW	8000.0	150.0	42.6	VFD&STAGED	276.020	0.910	0.900		
PRIMARY LOOP									

SCW 90 Pump	1 PUMP (s)						
__SCW 90	1060.0	125.0	42.6	VAR-SPEED	30.477	0.910	0.900
SECONDARY LOOP							

SCW 67 Pump	1 PUMP (s)						
__SCW 67	1060.0	125.0	42.6	VAR-SPEED	30.477	0.910	0.900
SECONDARY LOOP							

SCW 46 Pump	1 PUMP (s)						
__SCW 46	3040.0	125.0	42.6	VAR-SPEED	87.406	0.910	0.900
SECONDARY LOOP							

Upper Res PHW Pump	4 PUMP (s)						
Upper Res PHW	1520.0	125.0	32.6	VFD&STAGED	43.703	0.910	0.900
PRIMARY LOOP							

SHW FTR 90 Pump	1 PUMP (s)						
__SHW FTR 90	430.0	80.0	32.6	VAR-SPEED	7.913	0.910	0.900
SECONDARY LOOP							

SHW DHW 90 Pump	1 PUMP (s)						
__SHW DHW 90	2.3	80.0	22.6	VAR-SPEED	0.043	0.910	0.900
SECONDARY LOOP							

SHW FTR 67 Pump	1 PUMP (s)						
__SHW FTR 67	200.0	70.0	32.6	VAR-SPEED	3.220	0.910	0.900
SECONDARY LOOP							

SHW DHW 67 Pump	1 PUMP (s)						
__SHW DHW 67	2.3	80.0	22.6	VAR-SPEED	0.043	0.910	0.900
SECONDARY LOOP							

SHW FTR 46 Pump	1 PUMP (s)						
__SHW FTR 46	140.0	70.0	32.6	VAR-SPEED	2.254	0.910	0.900
SECONDARY LOOP							

SHW DHW 46 Pump	1 PUMP (s)						
__SHW DHW 46	2.3	80.0	22.6	VAR-SPEED	0.043	0.910	0.900
SECONDARY LOOP							

Lower Res PHW Pump	4 PUMP (s)						
Lower Res PHW	1900.0	125.0	32.6	VFD&STAGED	54.629	0.910	0.900
PRIMARY LOOP							

REPORT- PV-A Plant Design Parameters

WEATHER FILE- New York CityNY TMY2

----- (CONTINUED) -----

B-7-5	HW-CONDENSING	Lower Res PHW	-5.610	335.8	0.000	1.045	0.000
B-7-6	HW-CONDENSING	Lower Res PHW	-5.610	335.8	0.000	1.045	0.000
B-6-1	HW-CONDENSING	Retail PHW	-5.610	374.1	0.000	1.045	0.000
B-6-2	HW-CONDENSING	Retail PHW	-5.610	374.1	0.000	1.045	0.000
Fake - HP Loop Boiler	HW-CONDENSING	Res PCW	0.000	0.0	0.000	1.074	0.000
Retail Chiller 1	ELEC-SCREW	Retail CHW Loop	3.500	712.4	0.313	0.000	0.000
Retail Chiller 2	ELEC-SCREW	Retail CHW Loop	3.500	712.4	0.313	0.000	0.000
Retail Chiller 3	ELEC-SCREW	Retail CHW Loop	3.500	712.4	0.313	0.000	0.000
Penthouse WC Chiller	ELEC-OPEN-CENT	Penthouse CHW Loop	1.149	190.9	0.201	0.000	0.000
		Res PCW	1.155	230.8			

*** COOLING TOWERS ***

EQUIPMENT TYPE	ATTACHED TO	CAPACITY (MBTU/HR)	FLOW (GAL/MIN)	NUMBER OF CELLS	FAN POWER PER CELL (KW)	SPRAY PWR PER CELL (KW)	AUXILIARY (KW)
C-TR-1 OPEN-TWR	Res PCW	15.000	2997.6		46.154	0.000	0.000
C-TR-2 OPEN-TWR	Res PCW	15.000	2997.6	1	46.154	0.000	0.000
C-TR-3 OPEN-TWR	Res PCW	15.000	2997.6	1	46.154	0.000	0.000

*** DW-HEATERS ***

EQUIPMENT TYPE	ATTACHED TO	CAPACITY (MBTU/HR)	FLOW (GAL/MIN)	EIR (FRAC)	HIR (FRAC)	AUXILIARY (KW)	TANK (GAL)	TANK UA (BTU/HR-F)
Nordstrom Elec DHW Heater								
ELEC DW-HEATER	Retail Elec DHW Loop	-0.086	2.2	1.000	0.000	0.000	150.0	15.00

REPORT- SV-A System Design Parameters for SC3 (AC-SC3-4)

WEATHER FILE- New York CityNY TMY2

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)
PVAVS	1.000	15940.2	64.	0.300	757.502	0.629	-705.040	0.275	0.370	0.000

FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)
SUPPLY	18331.	1.00	12.847	2.17	0.0	0.00	0.00	DRAW-THRU	INLET	1.10	0.30

ZONE NAME	SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
SC3North Perim Zn (B.N1)	9052.	0.	0.000	0.300	2716.	0.00	0.00	205.30	-244.41	-122.20	1.
SC3SSW Perim Zn (B.SSW2)	9076.	0.	0.000	0.300	2723.	0.00	0.00	205.83	-245.04	-122.52	1.
SC3Core Zn (B.C4)	204.	0.	0.000	0.300	61.	0.00	0.00	4.62	-5.50	-2.75	1.