ENERGY MODEL REPORT SAMPLE

NYC SCA

SCA Exec Summary

School Information	
School Name	
Address	
Submission	100% CD
Date	

Baseline Information	
LL86 Baseline	ASHRAE 90.1-2013 ECB
GSG Baseline	ASHRAE 90.1-2010 PRM
GSG Version	2016 Rating System
% Renovation	0%

Energy Modeling Information	
Drawing Set	100% CD
Modeling Software & version	DOE2.2
Weather File	NY Central Park
Total Modeled Square Feet	107718.1
Area of plenums/ dummy zones	52200
Net Modeled Area	55518.1
Unconditioned Area	858
Conditioned SQFT	54660
Proposed Unmet Load Hours	192
LL86 Baseline Unmet Load Hours	211
GSG Baseline Unmet Load Hours	214

LL86 Results	
LL86 Baseline Regulated Cost	82572
Proposed Regulated Cost	65267
Regulated Cost Savings	21.0%
LL86 Baseline Total Cost	$ 110,728
Proposed Total Cost	$ 93,423
Total Cost Savings	16%
LL86 Baseline Site EUI	41.2
Proposed Site EUI	35.5
Site EUI Savings	14%
LL86 Source EUI	82.76
Proposed Source EUI	69.3
Source EUI Savings	16.2%
LL86 Compliant?	Compliant
Proposed Carbon (Ton CO2e)	142.1
Proposed Carbon (Ton CO2e/1000 ft2)	2.56

GSG Results	
GSG Baseline Total Cost	$ 116,762
Proposed Total Cost	$ 93,423
Total Cost Savings	20.0%
GSG Baseline Site EUI	43.0
Proposed Site EUI	35.5
Site EUI Savings	17%
GSG Source EUI	87.8
Proposed Source EUI	69.3
Source EUI Savings	21.0%
GSG Compliant?	Compliant
Optimize Energy Points	10

Note: An additional measure has been applied to the proposed design that cannot be applied for credit against LL86 or GSG. With the additional measure, the proposed source EUI is expected to reduce by another 0.4 kBTU/ft2, and meets the requirements of LL31.

Exceptional Calculations

Shorter Turn-Down Durations

The proposed design includes Lighting ECM-2 from the SWA/FX Collaborative LL31 Feasibility Study Phase 2 Report dated April 10, 2019. This measure reduces the turn down wait time for lighting sensors. This measure has been modeled separately from the proposed building model because it cannot be used for the purposes of LL86 or GSG compliance. ASHRAE 90.1 defines the modeling protocol used for LL86 and GSG, and specifies the amount of savings that can be attributed to occupancy sensors.

The following lighting credits have been modeled:

Space Type	Without ECM	With ECM
Classrooms	10% lighting reduction from OS	30% lighting reduction from OS
Corridors	10% lighting reduction from OS	25% lighting reduction from OS
Offices	10% lighting reduction from OS	30% lighting reduction from OS
Restrooms	10% lighting reduction from OS	45% lighting reduction from OS
Stairs	10% lighting reduction from OS	45% lighting reduction from OS *Reduced from 75% savings in LL31 report

This measure results in a 3016 kWh/yr reduction in electricity and an increase of 46 therms of natural gas. When these savings are applied to the proposed design, the projected source EUI is 69.7 kBtu/ft2 and the project meets the source energy target of <70 kBTU/ft2.

Case	Electric Use (kWh)	Natural Gas (Therms)	Source EUI
Proposed design w/o turndown credit	350988	7991	70.1
Proposed design w/ turndown credit	347,972	8037	69.7

5 Energy Modeling Usage Summary

	LL86 Baseline ASHRAE 90.1-2013 ECB		GSG Baseline ASHRAE 90.1-2010		Proposed Model			
	Electric Usage (kwh)	Gas/Steam Usage (Therm)	Electric Usage (kwh)	Gas/Steam Usage (Therm)	Electric Usage (kwh)	Gas/Steam Usage (Therm)	Energy Savings Per End Use (%) vs LL86	Energy Savings Per End Use (%) vs GSG
Interior Lighting	82,361	-	82,795	-	36,111	-	50%	38%
Misc. Equip.	142,706	-	143,701	-	142,706	-	0%	1%
Space Heat	-	8,258	-	8,049	1,566	7,821	12%	4%
Space Cool	80,432	-	83,820	-	65,677	-	16%	15%
Heat Rejection	-	-	-	-	-	-	0%	0%
Pumps & Misc	1,889	-	2,127	-	4,703	-	-3%	-2%
Vent Fans	78,088	-	107,749	-	60,028	-	19%	39%
Dom. Hot Water	40,279	-	40,286	-	34,579	-	6%	5%
Exterior Lighting	2,629	-	2,629	-	2,629	-	0%	0%
Exterior Misc.	-	-	-	-	-	-	0%	0%
TOTAL	428,384	8,258	463,106	8,049	347,999	7,821	100%	100%

5a Energy Related Design Features

List energy related features that are included in the design and contribute to the energy savings in Section 5.

- R-40 roofing w/ no thermal bridging.
- R-30 insulation in walls (U-0.084 per THERM model)
- Underslab R15 insulation
- Lower lighting levels (FC target same in design & baselines)
- Daylight dimming and lighting controls
- Extensive air sealing (infiltration levels same in design and baselines)
- Reduced bathroom faucet supply (same in design & baselines)
- Demand defrost in freezers & additional insulation @ walk-ins (same in design & baselines)

The following measures have been included in the design but have not been modeled for credit against the GSG or LL31 Baselines

- Shorter lighting turn-down ratios (ASHRAE regulates savings from occupancy sensors)

The following changes have been made to the model since the 60% CD submission

- Envelope performance better than SCA standard as described above
- Office equipment modeled per updated modeling guidelines. Two large copy machines have been included. The remainder of the office space is modeled at 0.51 W/ft2 instead of 4.77 W/ft2.
- All mechanical equipment updated per schedules

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SCA Window Summary

6b	Vertical Fenestration												
Model Input Parameter		LL86 Baseline ASHRAE 90.1-2013 ECB				GSG Baseline ASHRAE 90.1-2010				Proposed Case			
	Item	Description (from ASHRAE)	U-factor	SHGC	VLT	Description (from ASHRAE)	U-factor	SHGC	VLT	Description (from design)	U-factor	SHGC	VLT
Vertical	1	Metal framing (fixed)	U-0.42	0.4	0.67	Metal framing (all other)	U-0.55	0.40	0.44	SCA Standard Glazing (Average)	0.45	0.38	0.67
Vertical	2	Metal framing (operable)	U-0.50	0.4	0.67	Metal framing (all other)	U-0.55	0.40	0.44	SCA Standard Glazing (Average)	0.45	0.38	0.67
Vertical	3												
Vertical	4												
Vertical	5												
Vertical	6												
Vertical	7												
Skylight	1												
Skylight	2												
Shading Devices		☐No shading projections, manual shading devices, or self-shading have been modeled.				☐No shading projections, manual shading devices, or self-shading have been modeled.				List any permanent or auto-controlled shading devices:			
		☐Any shading by adjacent structures has been modeled identically to the proposed case.				☐Any shading by adjacent structures has been modeled identically to the proposed case.							

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SCA Wall Summary

Model Input Parameter	Space-Conditioning Category	Item #	LL86 Baseline ASHRAE 90.1-2013 ECB		GSG Baseline ASHRAE 90.1-2010		Proposed Case		
			Description	U-factor/ C-factor/ F-factor	Description	U-factor/ C-factor/ F-factor	Description	Assembly U-factor/ C-factor/ F-factor	% of above-grade wall
Roof Construction	Non-Residential	1	Insulation Entirely Above Deck	U-0.032	Insulation Entirely Above Deck	U-0.048	2 Layers precast concrete roofing pavers 8" rigid insulation (R-5/in) Roofing membrane 6" Concrete on metal deck	0.024	1
			Solar Reflectance	SR = 82	Solar Reflectance	SR =	Solar Reflectance		
		2							
			Solar Reflectance	SR =	Solar Reflectance	SR =	Solar Reflectance		
Above-Grade Exterior Wall Construction	Non-Residential	1	Mass	U-0.104	Steel-Framed	U-0.064	Rainscreen Air Space 6" Mineral Fiber insulation (R-4.2/in rated) Gypboard 6" Batt insulation (R-4.3/in) Gypboard U-value per THERM analysis	0.084	1
Below-Grade Exterior Wall Construction	Non-Residential	1	Below-Grade Wall	C-0.119				C-0.092	
		2							
Exposed Floor Construction		1							
Slab-On-Grade Floors	Non-Residential	1	Unheated	F-0.520			8" concrete slab 3" rigid insulation (R-5/in)	F-0.30	100
Opaque Doors	Non-Residential	1	Swinging	U-0.500			Standard Door	0.7	
		2							

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SCA Interior Lighting Summary

Space Type (Table 9.6.1) or Building Area Type (Table 9.5.1)	Total Area Space/Blg Type (ft^2)	LL86 Baseline ASHRAE 90.1-2013 ECB			GSG Baseline ASHRAE 90.1-2010			Proposed Case		
		Auto. Controls (Yes/No)	Daylight Ctrls (Yes/No)	Modeled LPD (W/ft2)	Auto. Controls (Yes/No)	Daylight Ctrls (Yes/No)	Modeled LPD (W/ft2)	Auto. Controls (Yes/No)	Daylight Ctrls (Yes/No)	Modeled LPD (W/ft2)
Classroom/lecture/training - all other	20,947	Yes	Yes	1.24	Yes	Yes	1.24	Yes	Yes	0.32
Office - Enclosed and < 250 sqft	3,599	Yes	Yes	1.00	Yes	Yes	1.11	Yes	Yes	0.44
Corridor - all other	9,674	Yes	No	0.66	No	No	0.66	Yes	No	0.33
Stairwell	3,381	Yes	No	0.69	No	No	0.69	No	No	0.35
Electrical/Mechanical	3,840	Yes	No	0.42	No	No	0.95	No	No	0.63
Storage room - all other	1,932	Yes	No	0.63	No	No	0.63	Yes	No	0.43
Locker Room	413	Yes	No	0.75	Yes	No	0.75	Yes	No	0.34
Restroom - all other	2,697	Yes	Yes	0.98	Yes	Yes	0.98	Yes	Yes	0.45
Dining Area - all other	5,146	Yes	Yes	0.65	No	Yes	0.65	Yes	Yes	0.85
Food Preparation Area	1,705	No	No	1.21	No	No	0.99	No	No	0.42
Corridor - all other	858	Yes	Yes	0.66	No	No	0.66	Yes	Yes	0.00
Laboratory - in or as a classroom	867	Yes	Yes	1.43	Yes	Yes	1.28	Yes	Yes	0.32
Library - Reading Area	460	Yes	Yes	1.06	Yes	Yes	0.93	Yes	Yes	0.15
Total	55,519			*0.93*			*0.97*			*0.41*

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Exterior LPD Process Equipment Summary

Exterior Lighting Power			
	LL32 Baseline (Watts)	GSG Baseline (Watts)	Proposed Design (Watts)
Tradable Lighting Power	1200	1200	480
Non-Tradable Lighting Power			
Base Site Allowance	600	600	
Total Lighting Power	2400	2400	480

Process/Receptacle Equipment				
Space Type (or Equipment Type)	Space Area (or # Equip.)	Proposed Design Equipment Power Density (W/SF)	LL32 Baseline Design Equipment Power Density (W/SF)	GSG Baseline Design Equipment Power Density (W/SF)
	SQFT	W/SF	W/SF	
Classroom	15246	1.03	1.03	1.034
Kitchen	1704	29.92	29.92	29.92
Office	3026	0.93	0.93	0.93
Data	658	26.50	26.50	26.5
Medical	573	0.51	0.51	0.51
Kind	1965	0.05	0.05	0.05
PreK	2913	0.10	0.10	0.10
Science	867	1.12	1.12	1.12
Reading	460	0.50	0.50	0.5
Music	823	0.25	0.25	0.25
Cafeteria	5146	0.25	0.25	0.25
TOTAL	33,380	2.71	2.71	2.71

Air-Side HVAC Systems						
	HVAC System / Group LL86 Baseline ASHRAE 90.1-2013 ECB		HVAC System / Group GSG Baseline ASHRAE 90.1-2010		HVAC System / Group (PROPOSED DESIGN)	
	Description	Units	Description	Units	Description	Units
System Type	System 4: Packaged VAV with reheat		System 5: Packaged VAV with Reheat		Rooftop AHU with CHW and HW	
System Designation(s)	CLASS-SYS-AHU-1, CLASS-SYS-AHU-2		CLASS-FL1-SYS, CLASS-FL2-SYS, CLASS-FL3-SYS		AHU-1, AHU-2	
# of Similar Systems	2		3		2	
Total Cooling Capacity	1458	kBtu/h	1966	kBtu/h	1079	kBtu/h
*Table 6.8.1 Unitary Cooling Capacity Range	240-760	kBtu/h	240-760 & 760+	kBtu/h	NA	kBtu/h
*Unitary Cooling Eff. (EER or SEER)	9.8	EER	9.8/9.5	EER	NA	EER
*Unitary Cooling Part-load Eff. (if applicable)	11.4	IEER	9.9/9.6	IEER	NA	IEER
Total Heating Capacity	801.47	kBtu/h	1170	kBtu/h	466	kBtu/h
*Table 6.8.1 Unitary Heating Capacity Range	NA	kBtu/h	NA	kBtu/h	NA	kBtu/h
*Unitary Heating Efficiency	NA	COP	NA	COP	NA	COP
*Fan Control	VAV		VAV		VAV	
Supply Airflow	39624	cfm	39954	cfm	27612	cfm
Outdoor Airflow	13823	cfm	13819	cfm	13818	cfm
*Demand Control Ventilation	Yes		Yes		Yes	
*Economizer High-Limit Shutoff (°F)	Dual Enthalpy		NA		Dual Enthalpy	
Exhaust Air Energy Recovery Systems	Yes		Yes		Yes	
*Exhaust Air Energy Recovery Effectiveness	50%		50%		40%	
Supply Fan Power	41.02	kW	39.74	kW	37.8	kW
Return/Relief Fan Power	25.9	kW	27.98	kW	16.86	kW
Exhaust Fan Power		kW		kW		kW
System Fan Power	66.92	kW	67.72	kW	54.66	kW
Allowed Fan Power:	66.92	kW	67.72	kW	NA	kW
Pressure Drop Adjustments	cfm	in w.c.	cfm	in w.c.		
Fully Ducted Return	39624	0.5	39954	0.5		
Filters: MERV 13-15	39624	0.9	39954	0.9		

Heat Recovery Device	27646	0.6	27638	0.6	Based on 50% efficiency for 1 stream. Enter cfm for supply + exhaust through ERV
Sound Attenuation Section	13823	0.15	13819	0.15	
Other					
Other					
Equipment Included (per Mechanical Schedules)					AHU-1
					AHU-2
					General Note: Exhaust fans are directly metered

Air-Side HVAC Systems						
	HVAC System / Group LL86 Baseline ASHRAE 90.1-2013 ECB		HVAC System / Group GSG Baseline ASHRAE 90.1-2010		HVAC System / Group (PROPOSED DESIGN)	
	Description	Units	Description	Units	Description	Units
System Type	System 11: Packaged rooftop AC		System 3: PSZ-AC		Single Zone VAV	
System Designation(s)	K/C-SYS-AHU-3		K/C-SYS-AHU-3		K/C-SYS-AHU-3	
# of Similar Systems	1		1		1	
Total Cooling Capacity	507	kBtu/h	522	kBtu/h	440	kBtu/h
*Table 6.8.1 Unitary Cooling Capacity Range	240-760	kBtu/h	240-760	kBtu/h	NA	kBtu/h
*Unitary Cooling Eff. (EER or SEER)	9.8	EER	9.8	EER	NA	EER
*Unitary Cooling Part-load Eff. (if applicable)	11.4	IEER	9.9	IEER	NA	IEER
Total Heating Capacity	488	kBtu/h	708	kBtu/h	267	kBtu/h
*Table 6.8.1 Unitary Heating Capacity Range	>225	kBtu/h	>225	kBtu/h	NA	kBtu/h
*Unitary Heating Efficiency	80%	Et	80%	Et	NA	COP
*Fan Control	CV, 2-Speed Fan		CV		VAV	
Supply Airflow	8946	cfm	9112	cfm	8547	cfm
Outdoor Airflow	5278	cfm	5276	cfm	5282	cfm
*Demand Control Ventilation	No		No		Yes	
*Economizer High-Limit Shutoff (°F)	NA		NA		Dual Enthalpy	
Exhaust Air Energy Recovery Systems	Yes		Yes		Yes	
*Exhaust Air Energy Recovery Effectiveness	50%		50%		40%	
Supply Fan Power	10.8	kW	12.7	kW	8.7	kW
Return/Relief Fan Power	0	kW	0	kW	0	kW
Exhaust Fan Power		kW		kW		kW
System Fan Power	10.8	kW	12.7	kW	8.7	kW
Allowed Fan Power:	10.8	kW	12.7	kW	8.7	kW
Pressure Drop Adjustments	cfm	in w.c.	cfm	in w.c.		
Fully Ducted Return	8946	0.5	9112	0.5		
Filters: MERV 13-15	8946	0.9	9112	0.9		
Heat Recovery Device	10556	0.6	10552	0.6	Based on 50% efficiency for 1 stream. Enter cfm for supply + exhaust through ERV	
Sound Attenuation Section	5278	0.15	5276	0.15		
Other						
Other						
Equipment Included (per Mechanical Schedules)					AHU-3	
					Note: All exhaust fans, including KEF-1 & KGEF-1 are directly metered	

Air-Side HVAC Systems						
	HVAC System / Group LL86 Baseline ASHRAE 90.1-2013 ECB		HVAC System / Group GSG Baseline ASHRAE 90.1-2010		HVAC System / Group (PROPOSED DESIGN)	
	Description	Units	Description	Units	Description	Units
System Type	System 8: PTHP		System 3: PSZ-AC		PSZ-HP	
System Designation(s)	DATA-SYS		DATA-SYS		DATA-SYS	
# of Similar Systems	1		1		1	
Total Cooling Capacity	40	kBtu/h	42	kBtu/h	94.2	kBtu/h
*Table 6.8.1 Unitary Cooling Capacity Range	<65	kBtu/h	<65	kBtu/h	NA	kBtu/h
*Unitary Cooling Eff. (EER or SEER)	13	SEER	13	SEER	15.2	SEER
*Unitary Cooling Part-load Eff. (if applicable)	NA	IEER	NA	IEER	NA	IEER
Total Heating Capacity	NA	kBtu/h	NA	kBtu/h	34.2	kBtu/h
*Table 6.8.1 Unitary Heating Capacity Range	NA	kBtu/h	NA	kBtu/h	<65	kBtu/h
*Unitary Heating Efficiency	8.2	HSPF	NA	Et	8	HSPF
*Fan Control	CV		CV		CV	
Supply Airflow	933	cfm	933	cfm	933	cfm
Outdoor Airflow	0	cfm	0	cfm	0	cfm
*Demand Control Ventilation	No		No		No	
*Economizer High-Limit Shutoff (°F)	NA		NA		NA	
Exhaust Air Energy Recovery Systems	No		No		No	
*Exhaust Air Energy Recovery Effectiveness						
Supply Fan Power	0.55	kW	0.55	kW	0.55	kW
Return/Relief Fan Power	0	kW	0	kW	0	kW
Exhaust Fan Power		kW		kW		kW
System Fan Power	0.55	kW	0.55	kW	0.55	kW
Allowed Fan Power:	0.55	kW	0.55	kW	0.55	kW
Pressure Drop Adjustments	cfm	in w.c.	cfm	in w.c.		
Fully Ducted Return	NA	0.5	NA			
Filters: MERV 13-15	NA	0.9	NA			
Heat Recovery Device	NA	0.6	NA		Based on 50% efficiency for 1 stream. Enter cfm for supply + exhaust through ERV	
Sound Attenuation Section	NA	0.15	NA			
Other						
Other						
Equipment Included (per Mechanical Schedules)					AC-G-2	
					AC-1-1	
					AC-2-1	
					AC-G-1	
					AC-R-1	

Air-Side HVAC Systems						
	HVAC System / Group LL86 Baseline ASHRAE 90.1-2013 ECB		HVAC System / Group GSG Baseline ASHRAE 90.1-2010		HVAC System / Group (PROPOSED DESIGN)	
	Description	Units	Description	Units	Description	Units
System Type	System 8: PTHP		System 9: Heating and Ventilation		Electric Unit Heaters	
System Designation(s)	HEAT-ONLY-SYS		HEAT-ONLY-SYS		HEAT-ONLY-SYS	
# of Similar Systems	1		1		1	
Total Cooling Capacity	0	kBtu/h	0	kBtu/h	0	kBtu/h
*Table 6.8.1 Unitary Cooling Capacity Range	NA	kBtu/h	NA	kBtu/h	NA	kBtu/h
*Unitary Cooling Eff. (EER or SEER)	NA	SEER	NA	SEER	NA	EER
*Unitary Cooling Part-load Eff. (if applicable)	NA	IEER	NA	IEER	NA	IEER
Total Heating Capacity	50.65	kBtu/h	57	kBtu/h	51.2	kBtu/h
*Table 6.8.1 Unitary Heating Capacity Range	<65	kBtu/h	<65	kBtu/h	NA	kBtu/h
*Unitary Heating Efficiency	8	HSPF	80%	Et	NA	COP
*Fan Control	CV		CV		CV	
Supply Airflow	1895	cfm	702	cfm	1900	cfm
Outdoor Airflow	0	cfm	0	cfm	0	cfm
*Demand Control Ventilation	No		No		No	
*Economizer High-Limit Shutoff (°F)	NA		NA		NA	
Exhaust Air Energy Recovery Systems	No		No		No	
*Exhaust Air Energy Recovery Effectiveness						
Supply Fan Power	0.562	kW	0.208	kW	0.567	kW
Return/Relief Fan Power	0	kW	0	kW	0	kW
Exhaust Fan Power		kW		kW		kW
System Fan Power	0.562	kW	0.208	kW	0.567	kW
Allowed Fan Power:	0.562	kW	0.208	kW	0.567	kW
Pressure Drop Adjustments	cfm	in w.c.	cfm	in w.c.		
Fully Ducted Return	NA	0.5	NA			
Filters: MERV 13-15	NA	0.9	NA			
Heat Recovery Device	NA	0.6	NA		Based on 50% efficiency for 1 stream. Enter cfm for supply + exhaust through ERV	
Sound Attenuation Section	NA	0.15	NA			
Other						
Other						
Equipment Included (per Mechanical Schedules)					EUH-X	

Hot Water or Steam						
Model Input Parameter	LL86 Baseline ASHRAE 90.1-2013 ECB		GSG Baseline ASHRAE 90.1-2010		HVAC System / Group (PROPOSED DESIGN)	
	Description	Units	Description	Units	Description	Units
Number and Type of Boilers	Gas Fired, Hot Water		Gas Fired, Hot Water		Modulating Condensing w/ 30% propylene glycol solution in primary loop	
Total Boiler Capacity	1660	kBTU	1654	kBtu	2400	kBTU
Boiler Efficiency	0.8	Et	0.8	Et	93% (@RWT=120°F) 86% (@RWT=140°F)	%
Hot Water or Steam (HHW) Supply Temp	SWT=180°F @ OAT≤20°F SWT=150 °F @ OAT≥50°F	°F	SWT=180°F @ OAT≤20°F SWT=150 °F @ OAT≥50°F	°F	SWT=180°F @ OAT≤20°F SWT=150 °F @ OAT≥50°F	°F
HHW ΔT	50	°F	50	°F	40	°F
HHW Temp Reset Parameters	Outdoor air – supply water temp reset		Outdoor air – supply water temp reset		Outdoor air – return water temp reset	
HHW Loop Configuration	Primary Only		Primary Only		Primary Only	
Number of Primary HHW Pumps	1		1	#	2 active	#
Primary HHW Pump Power	3.1	hp	3.2	HP	6	HP
Primary HHW Pump Flow	66.5	gpm	66.2	gpm	60	gpm
Primary HHW Pump Control	Ride pump curve; two-way valves on coils		Ride pump curve; two-way valves on coils		Variable speed	
Number of Secondary HHW Pumps		#		#	1 Active	#
Secondary HHW Pump Power					3	HP
Secondary HHW Pump Flow		gpm		gpm	60	gpm
Secondary HHW Pump Control					Variable speed	
Other (describe)						
Other (describe)						
Other (describe)						
Other (describe)						

Chilled Water				
Model Input Parameter	GSG Baseline ASHRAE 90.1-2010		HVAC System / Group (PROPOSED DESIGN)	
	Description	Units	Description	Units
# and Type of Chillers (and capacity of chiller if more than 1 type or size)	0- Building area < 150,000		Air cooled w/ 30% propylene glycol solution in primary loop	
Total Chiller Capacity			150	tons
Chiller Efficiency - Full Load			1.1827	kW/ton
Chiller Efficiency - Part Load			0.7704	kW/ton
Chilled Water (CHW) Supply Temp		°F	45	°F
CHW ΔT		°F	10	°F
CHW Supply Temp Reset Parameters			Demand Reset	
CHW Loop Configuration			Primary only	
Number of Primary CHW Pumps		#	1 active	#
Primary CHW Pump Power			10	HP
Primary CHW Pump Flow		gpm	368	gpm
Primary CHW Pump Control			Variable Speed	
Number of Secondary CHW Pumps		#	0	#
Secondary CHW Pump Power			NA	0
Secondary CHW Pump Flow		gpm	0	gpm
Secondary CHW Pump Control			NA	
Water-Side Economizer				
Water-Side Energy Recovery				
Number of Cooling Towers/Fluid Coolers				
Cooling Tower Fan Power				
Cooling Tower Fan Control				
Condenser Water (CW) Leaving Temp		°F		
CW ΔT		°F		
CW Loop Temp Reset Parameters				
Number of CW Pumps		#		
CW Pump Power				
CW Pump Flow		gpm		
CW Pump Control				
Other (describe)				
Other (describe)				
Other (describe)				
Other (describe)				

eQuest Model Review Checklist

General information	Response
Does the project area include a kitchen?	Yes
Verify the kitchen type (full gas, full electric, or warming) been modeled per the proposed design and the kitchen loads reflect the number of students in the POR.	Yes
Verify the occupancy and ventilation requirements in the classrooms been updated to match the POR.	Yes
Is the net modeled project area within 3% of the design area?	Yes

Describe any changes between this submission and the previous submission:
This is a revision to the 30% DD submission. - Report format updated -ECM's added to to proposed design

Describe deviations from the SCA Standard Details (Including SCA approved ECMs)

R-30 wall insulation	
R-40 roof insulation	Reduce HW temp in lavatories
R-15 underslab insulation	Demand defrost for freezers
7500 ft2 solar PV's	Increased insulation for walk-in coolers
Extensive air sealing	EnergyStar equipment
Gearless elevator	Partial Sumer operation

Automatic Checks	Explanation, if required
The "Ext Usage" EFLH is more than 4,500 per the report design value. Exterior lighting is only to be run during dark hours, even worst cases should not exceed this value. Please correct or provide an explanation.	
The sum of the hours above cooling throttling range and heating throttling is above 300. Please correct.	
The total amount of hours the design is out of range (heating + cooling) differs from the GSG baseline by more than 50 hours. Please correct or provide an explanation.	The envelope has improved from the initial 30% DD model. This is a DD response. The baselines will be revised at 60% CD.
The calculated lighting EFLH is 1722 hrs. Between 1,600 and 2,500 is expected using the template schedules. Please correct or provide explanation.	
The Misc Equipment is 53.8% of the total electricity. It is expected to be between 20-35%. Please correct or provide an explanation.	The miscellaneous equipment loads have been modeled per the modeling guidelines. The school has electric cooking facilities, which increase the electric consumption.
The Misc Equipment is not the same in baseline and proposed designs. Please correct or provide an explanation.	
The Domestic Hot Water is 12.8% of the total heating fuel. It is expected to be less than 10% for projects without kitchens and 10-20% for projects with kitchens. Please correct or provide an explanation.	
The proposed Space Cooling is 28.6% of the total electricity. It is typically less than 30%. Please correct or provide an explanation	
The proposed Vent Fans is 18.5% of the total electricity. It is typically less than 30%. Please correct or provide an explanation.	

eQuest Model Review Checklist- Output Report Verification

BEPU report information	Yes/No	Supporting Documentation (if needed)
Is the "Weather file" consistent with the building location.	Yes	
Is "Task Lighting" the same between baselines and proposed cases? If no, fix or provide supporting documentation.	Yes	
Is the split between electricity and natural gas "Space Heating" consistent with the design and report documentation?	Yes	
Is the "Pumps and Aux" EFLH consistent with the design? i.e. total pump EFLH should be roughly equal to the sum of respective plant EFLH for plants with pumps.	Yes	
Is the split between electricity and natural gas "Domest Hot Wtr" consistent with the DHW system design?	Yes	
Is “Percent of hours any plant load not satisfied” 0%? If no, fix or provide supporting documentation.	Yes	
Is "Heat Rejection" zero ? If no, provide an explanation. Heat rejection should only be more than zero for water-cooled units (GSG Baseline > 150,000 ft2 and designs that deviate from the standard)	Yes	

ES-D report information	Yes/No	Supporting Documentation (if needed)
Do the utility costs match the values in the report?	Yes	

LV-B report information	Yes/No	Supporting Documentation (if needed)
Are the lighting power densities consistent with the report/photometric drawing/code requirements? Have lighting schedules been assigned that reflect mandatory controls (template defaults should be sufficient)?	Yes	
Are the equipment power densities consistent with the input summary?	Yes	

LV-D report information	Yes/No	Supporting Documentation (if needed)
Is the "Window Area" divided by the "Window+Wall Area" for the "All Walls" line consistent with the report window to wall ratio?	Yes	
Is the roof area consistent with the footprint of the building?	Yes	
Select a few representative wall definitions, are their U-values consistent with report values? Note: The LV-D and LV-I reports calculations are not consistent with the protocol established by ASHRAE 90.1 Appendix A. The interior air film coefficient default does not account for the orientation of the construction. The LV-I U-value calculation does not consider the exterior air film, and the LV-D U-value calculation uses a different value than specified by ASHRAE 90.1 Appendix A. During the simulation, eQuest calculates the exterior air film hourly based on the wind speed from the weather file.	Yes	
Select a few representative window definitions, are their U-values consistent with report values? Note: The window U-values include an exterior film with R-value = 0.3. NFRC uses 0.17 to calculate the U-factor. The U-value from the LV-D report will be 3-5% lower than reported value.	Yes	

LV-H report information	Yes/No	Supporting Documentation (if needed)
Is the weighted average U-value consistent with the report values for frame and glass U-values?	Yes	
Is the "Glass Shading Coeff" and "Glass Visible Trans" consistent with the report and design values?	Yes	
Is a "setback" modeled? If yes, is it consistent with the design? No setback should be modeled in the baseline condition for new construction projects.	Yes	

LV-I report information	Yes/No	Supporting Documentation (if needed)
Are U-Values within the acceptable range of the reported values? Note: Compare U-values reported in the LV-D report to those in the LV-I report. The LV-I report values will be higher, with variation depending on the thermal properties of the wall. LV-I values may vary from LV-D report as follows LV-D U-value - LV-I Deviation <0.07 - <5% higher 0.07 - 0.13 - 5-10% higher 0.13 - 0.17 - 10-15% higher 0.17 - 0.20 - 15-20% higher	Yes	
Are "Delayed" surface types used for exterior wall and roof construction definitions? If no, explain where building massing is being accounted for in the model.	Yes	
Are the "Number of Response Factors" consistent with report mass vs. framed construction?	Yes	

SV-A report information	Yes/No	Supporting Documentation (if needed)
Has an SV-A report been provided for all systems referenced in the report?	Yes	
Is there 1-1 correspondence in the number of systems between the LL32 baseline and proposed design?	Yes	
Is there one system per floor for the GSG baseline, with the exception of the public assembly spaces and 24hr data rooms?	Yes	
Are "Capacity (CFM)" and "Power Demand" consistent with the report?	Yes	
Is the "Outside Air Ratio" consistent with the ratio calculated using the report values?	Yes	
Is the "Outside Air Ratio" lower than the "Minimum Flow"? If no, correct this. Note: eQuest has a known bug where the software will not reset minimum flow up to the outside air ratio.	Yes	
Are there "Baseboards" defined in the Proposed system? Is this consistent with the report? No baseboards should be defined in the baseline systems.	Yes	

PV-A report information	Yes/No	Supporting Documentation (if needed)
Is the "rated capacity" of proposed equiment consistent with the report and design values?	Yes	
Does pump "Head" match between proposed and LL32 baseline?	Yes	
Calculate the GSG baseline "Power"/"Flow" for secondary and primary pumps. Does this value add up to 19 W/gpm for heating, 22 W/gpm for cooling, and 19 W/gpm for the condenser loop? Chilled and condenser water loops should be present in schools >150,000 ft2 only.	Yes	
Are "Capacity Control" values consistent with the report? Note: If a loop is served by more than 1 pump, the variable speed pumps will be reported as "VFD & STAGED"	Yes	

PS-E report information	Yes/No	Supporting Documentation (if needed)
Do "Task Lighting", "Misc Equip", "Domest Hot Wtr", and "Ext Usage" all have the same Max kW for all months? If not, is this explained?	Yes	
If daylighting is specified, does "lights" Max kW have a minimum in the summer and maximum in the winter? Note: if daylighting is claimed but not modeled the lighting use will only be determined by the schedule and the peak will not vary. The peak vaires becaue of the change in solar angle from summer to winter. The use varies also because the number of hours of daylight changes as well. When daylighting is modeled, the EFLH will not match the schedule.	Yes	
Is "Space Heating" zero for june to sept? If not, is it explained in the report? Is there reheat specified?	Yes	
Is "space cooling" minimal in the winter? Are these values consistent with the data room equipment sizes? Note: peaks in winter should be equal to the power input of data or EMR dedicated units.	Yes	