

LEED 2009 EA Credit 1 Summary Report

GDE-2016-Office-VAV-6
Carrier Corporation

10/29/2016
10:01AM

General Information

Simulation Program Name and Version ... **Hourly Analysis Program v5.00**
Simulation Weather File Name **Charlotte, North Carolina (TM2)**

Building Designations

Proposed Building **[P] 23XRM VAV 30% 55F Min ECWT**
Baseline - 0 degrees **[B000] Baseline Building 90.1-2007**
Baseline - 90 degrees **[B090] Baseline Building 90.1-2007**
Baseline - 180 degrees **[B180] Baseline Building 90.1-2007**
Baseline - 270 degrees **[B270] Baseline Building 90.1-2007**

Floor Areas

	Proposed Design	Baseline
Total Conditioned Floor Area (ft ²)	510,000	510,000
Total Floor Area (ft ²)	510,000	510,000

Envelope and Glazing Data

Above-Grade Wall & Vertical Glazing Areas:

Orientation	Baseline Design (0° rotation)			Proposed Design		
	Gross Above-Grade Wall Area	Vertical Glazing Area		Gross Above-Grade Wall Area	Vertical Glazing Area	
	(ft ²)	(ft ²)	(% WWR)	(ft ²)	(ft ²)	(% WWR)
North	40,800	14,296	35.0	40,800	14,296	35.0
North-Northeast	0	0	0.0	0	0	0.0
Northeast	0	0	0.0	0	0	0.0
East-Northeast	0	0	0.0	0	0	0.0
East	40,800	14,296	35.0	40,800	14,296	35.0
East-Southeast	0	0	0.0	0	0	0.0
Southeast	0	0	0.0	0	0	0.0
South-Southeast	0	0	0.0	0	0	0.0
South	40,800	14,296	35.0	40,800	14,296	35.0
South-Southwest	0	0	0.0	0	0	0.0
Southwest	0	0	0.0	0	0	0.0
West-Southwest	0	0	0.0	0	0	0.0
West	40,800	14,296	35.0	40,800	14,296	35.0
West-Northwest	0	0	0.0	0	0	0.0
Northwest	0	0	0.0	0	0	0.0
North-Northwest	0	0	0.0	0	0	0.0
Total	163,200	57,184	35.0	163,200	57,184	35.0

Roof & Skylight Areas:

Baseline Design (0° rotation)			Proposed Design		
Gross Roof Area	Skylight Area		Gross Roof Area	Skylight Area	
(ft ²)	(ft ²)	(%)	(ft ²)	(ft ²)	(%)
30,000	0	0.0	30,000	0	0.0

Note: In these tables, roof and skylight surfaces with slope of 60° or more (from horizontal) are treated as walls and vertical glazing, as according to ASHRAE 90.1 Section 3.

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Advisory Messages

Message	Proposed Building	Baseline Building (0 deg. rotation)	Difference
Number of hours heating loads not met	115	132	-17
Number of hours cooling loads not met	1	32	-31

Energy Type Summary

Energy Type	Utility Rate Description	Units of Energy	Units of Demand
Electric	North Carolina - EIA 2014	kWh	kW
Natural Gas	North Carolina - EIA 2014	THM	MBH

Energy Units:

1 kBTU = 1,000 BTU
1 kWh = 3.412 kBTU
1 THM = 100.000 kBTU

Demand Units:

1 MBH = 1,000 BTU/h
1 kW = 3.412 MBH

Baseline Performance - Performance Rating Method Compliance

End Use	Process	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0 deg rotation)	Baseline (90 deg rotation)	Baseline (180 deg rotation)	Baseline (270 deg rotation)	Baseline Design
Interior Lighting	No	Electric	Energy kWh	1,415,903	1,415,903	1,415,903	1,415,903	1,415,903
			Demand kW	436.1	436.1	436.1	436.1	436.1
Space Heating	No	Natural Gas	Energy THM	40,502	39,728	39,721	39,742	39,923
			Demand MBH	7,224.5	7,055.9	7,055.8	7,055.6	7,097.9
Space Cooling	No	Electric	Energy kWh	556,929	554,596	554,648	554,735	555,227
			Demand kW	510.7	508.1	508.1	508.3	508.8
Pumps	No	Electric	Energy kWh	161,835	161,072	161,068	161,096	161,268
			Demand kW	90.5	90.0	90.0	90.0	90.1
Heat Rejection	No	Electric	Energy kWh	55,458	55,184	55,189	55,197	55,257
			Demand kW	37.5	37.3	37.3	37.3	37.3
Fans - Interior	No	Electric	Energy kWh	499,433	497,673	497,854	498,141	498,275
			Demand kW	254.3	251.0	251.0	251.4	251.9
Receptacle Equipment	Yes	Electric	Energy kWh	1,121,855	1,121,855	1,121,855	1,121,855	1,121,855
			Demand kW	345.5	345.5	345.5	345.5	345.5
Elevators	Yes	Electric	Energy kWh	15,271	15,271	15,271	15,271	15,271
			Demand kW	6.9	6.9	6.9	6.9	6.9
Parking Lot Lighting-tradable	No	Electric	Energy kWh	2,626	2,626	2,626	2,626	2,626
			Demand kW	0.6	0.6	0.6	0.6	0.6
Parking Lot Lighting-ntradable	No	Electric	Energy kWh	11,819	11,819	11,819	11,819	11,819
			Demand kW	2.7	2.7	2.7	2.7	2.7
Service Hot Water	No	Natural Gas	Energy THM	11,951	11,951	11,951	11,951	11,951
			Demand MBH	427.5	427.5	427.5	427.5	427.5
Domestic HW Circ Pump	Yes	Electric	Energy kWh	1,593	1,593	1,593	1,593	1,593
			Demand kW	0.6	0.6	0.6	0.6	0.6
Water Feature Circ Pump	Yes	Electric	Energy kWh	11,388	11,388	11,388	11,388	11,388
			Demand kW	1.3	1.3	1.3	1.3	1.3
Baseline Energy Totals	Total Annual Energy Use kBTU			18,395,475	18,300,628	18,300,681	18,304,222	18,325,252
	Annual Process Energy kBTU							3,924,164

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Process Energy Modeling Compliance

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(1) This form determines compliance using cost calculations from Section 1.9. Process Energy Costs should be modeled to accurately reflect the proposed building. Process Energy must be the same in the baseline and proposed cases, unless an exceptional calculation is used. Process energy costs must be at least 25% of the total baseline energy costs. Any exceptions must be supported by a narrative and/or other supporting documentation.

(2) In this project Process Energy is 26% of total baseline energy cost.

Baseline Energy Costs

Energy Type	Baseline Cost (0 deg rotation) (\$)	Baseline Cost (90 deg rotation) (\$)	Baseline Cost (180 deg rotation) (\$)	Baseline Cost (270 deg rotation) (\$)	Baseline Building Performance (\$)
Electric	337,235	336,786	336,806	336,842	336,917
Natural Gas	47,837	47,131	47,125	47,144	47,309
Total Baseline Costs	385,071	383,917	383,931	383,986	384,226

Performance Rating Table - Performance Rating Method Compliance

End Use	Process ?	Baseline Building Units	Baseline Building Results	Proposed Design Energy Type	Proposed Design Units	Proposed Building Results	Percent Savings
Interior Lighting	No	Energy kWh	1,415,903	Electric	Energy kWh	1,415,903	0 %
		Demand kW	436.1		Demand kW	436.1	0 %
Space Heating	No	Energy THM	39,923	Natural Gas	Energy THM	27,000	32 %
		Demand MBH	7,097.9		Demand MBH	3,539.2	50 %
Space Cooling	No	Energy kWh	555,227	Electric	Energy kWh	241,861	56 %
		Demand kW	508.8		Demand kW	301.6	41 %
Pumps	No	Energy kWh	161,268	Electric	Energy kWh	102,943	36 %
		Demand kW	90.1		Demand kW	47.5	47 %
Heat Rejection	No	Energy kWh	55,257	Electric	Energy kWh	71,625	-30 %
		Demand kW	37.3		Demand kW	24.1	35 %
Fans - Interior	No	Energy kWh	498,275	Electric	Energy kWh	259,968	48 %
		Demand kW	251.9		Demand kW	135.9	46 %
Receptacle Equipment	Yes	Energy kWh	1,121,855	Electric	Energy kWh	1,121,855	0 %
		Demand kW	345.5		Demand kW	345.5	0 %
Elevators	Yes	Energy kWh	15,271	Electric	Energy kWh	15,271	0 %
		Demand kW	6.9		Demand kW	6.9	0 %
Parking Lot Lighting-tradable	No	Energy kWh	2,626	Electric	Energy kWh	2,626	0 %
		Demand kW	0.6		Demand kW	0.6	0 %
Parking Lot Lighting-ntradable	No	Energy kWh	11,819	Electric	Energy kWh	11,819	0 %
		Demand kW	2.7		Demand kW	2.7	0 %
Service Hot Water	No	Energy THM	11,951	Natural Gas	Energy THM	11,951	0 %
		Demand MBH	427.5		Demand MBH	427.5	0 %
Domestic HW Circ Pump	Yes	Energy kWh	1,593	Electric	Energy kWh	1,593	0 %
		Demand kW	0.6		Demand kW	0.6	0 %
Water Feature Circ Pump	Yes	Energy kWh	11,388	Electric	Energy kWh	11,388	0 %
		Demand kW	1.3		Demand kW	1.3	0 %
Energy Totals	Baseline Total Energy Use (kBTU)		18,325,252	Proposed Total Energy Use (kBTU)		15,007,453	18 %
	Baseline Annual Process Energy (kBTU)		3,924,164	Proposed Annual Process Energy (kBTU)		3,924,164	0 %

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Energy Cost and Consumption by Energy Type - Performance Rating Method Compliance

Energy Type	Proposed Design		Baseline Design	
	Energy Use	Cost (\$)	Energy Use	Cost (\$)
Electric	3,256,852 kWh	284,975	3,850,482 kWh	336,917
Natural Gas	38,951 THM	35,523	51,874 THM	47,309
Subtotal (Model Outputs)	15,007,453 kBTU	320,498	18,325,252 kBTU	384,226
	Energy Generated	Renewable Energy Cost Savings (\$)		
Total On Site Renewable Energy				
	Energy Savings	Cost Savings (\$)		
Exceptional Calculation Totals				
	Energy Use	Cost (\$)		
Net Proposed Design Total	15,007,453 kBTU	320,498		
	Percent Savings		Energy Use Intensity	
	Energy	Cost	Proposed Design (kBTU/ft²)	Baseline Design (kBTU/ft²)
Summary Data	18.1 %	16.6 %	29.43	35.93

LEED 2009 EA Credit 1 Points Reference Table

New Construction % Cost Savings	Existing Building Renovations % Cost Savings	LEED 2009 Points Awarded
12%	8%	1 pt
14%	10%	2 pt
16%	12%	3 pts
18%	14%	4 pts
20%	16%	5 pts
22%	18%	6 pts
24%	20%	7 pts
26%	22%	8 pts
28%	24%	9 pts
30%	26%	10 pts
32%	28%	11 pts
34%	30%	12 pts
36%	32%	13 pts
38%	34%	14 pts
40%	36%	15 pts
42%	38%	16 pts
44%	40%	17 pts
46%	42%	18 pts
48%	44%	19 pts