LEED Energy Performance Summary Report

By BENNETT ENGINEERING, INC.

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 10/16/14

Section 1.1 - General Information

Simulation Program:	TRACE™ 700 v6.2.10
Energy Code Used:	Code not selected
New Construction Percent:	0 %
Existing Renovation Percent:	100 %
Quantity of Stories:	1
Principle Heating Source:	Fossil/Electric Hybrid
Weather File:	Portland, Maine (Reduced Year)
Climate Zone:	6A
Proposed:	Alternative 3 - improved mech - U-0_30 SC-0_64
Baseline:	Alternative 1 - Existing Conditions - Base Case

Section 1.2 - Space Summary

Building Use (Occupancy Type)	Conditioned Area (ft^2)	Unconditioned Area (ft^2)	Total Area (ft^2)
Default	32,323	0	32,323
Total	**32,323**	**0**	**32,323**

Section 1.3 - Advisory Messages

Advisory Messages	Proposed Building	Baseline Building (0 deg rotation)
Number of hours heating load not met:	0	0
Number of hours cooling load not met:	0	0
Total	0	0

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Section 1.4 - Comparison of Proposed Design Versus Baseline De

Input Parameter	Proposed Design Input	Baseline De
Exterior Wall Construction	16" Brick - 2.5" Spray U-0.075 U-factor: 0.075 Btu/h·ft²·°F	16" Brick - U-0.284 U-factor: 0.284 Btu/h·ft²·°F
Exterior Wall Construction	16" Brick - U-0.284 U-factor: 0.284 Btu/h·ft²·°F	
Roof Construction	1" Wood, 8" Rigid Ins U-factor: 0.025 Btu/h·ft²·°F Reflectivity: 0.10	1" Wood, no Ins U-factor: 0.394 Btu/h·ft²·°F Reflectivity: 0.10
Window-to-gross wall ratio	29.5 %	29.5 %
Fenestration Type	Paradigm U-0.30 SHGC-0.56 U-factor: 0.300 Btu/h·ft²·°F SHGC: 0.55 Visible Transmissivity: 0.590	Double Clear 1/8" U-factor: 0.600 Btu/h·ft²·°F SHGC: 0.76 Visible Transmissivity: 0.709
Interior Light Power Density	Lighting Compliance: Space-By-Space Method Daylighting Controls: No 1.50 W/ft²	Lighting Compliance: Space-By-Space Method Daylighting Controls: No 1.50 W/ft²
Slab-on-grade or Exposed Floor	0.026_4" LW Conc, 5" spray Slab-On-Grade F-Factor: 0.500 Btu/hr·ft·°F	0.026_4" LW Conc, 5" spray Slab-On-Grade F-Factor: 0.500 Btu/hr·ft·°F
Receptacle Equip Power Density	1.00 W/ft²	1.00 W/ft²
HVAC System Type	HVAC Tenant D Terminal Reheat Uses: DB Econ, Heat recov Supply vol: 3830 cfm Fan power: 4.10 kW	VAV Reheat Variable Volume Reheat (30% Min Flow Default) Uses: DB Econ, Heat recov Supply vol: 71853 cfm Fan power: 56.05 kW
HVAC System Type	HVAC Tenant C Terminal Reheat Uses: DB Econ, Heat recov Supply vol: 1778 cfm Fan power: 1.90 kW	

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Section 1.4 - Comparison of Proposed Design Versus Baseline De

Input Parameter	Proposed Design Input	Baseline De
HVAC System Type	HVAC Tenant F Terminal Reheat Uses: DB Econ, Heat recov Supply vol: 7718 cfm Fan power: 8.26 kW	
HVAC System Type	HVAC Tenant E Terminal Reheat Uses: DB Econ, Heat recov Supply vol: 2084 cfm Fan power: 2.23 kW	
HVAC System Type	HVAC Tenant B Terminal Reheat Uses: DB Econ, Heat recov Supply vol: 2667 cfm Fan power: 2.85 kW	
HVAC System Type	HVAC Tenant A Terminal Reheat Uses: DB Econ, Heat recov Supply vol: 11748 cfm Fan power: 12.57 kW	
Cooling Equipment	Plant: Cooling plant - 012 Type: Light Commercial Rooftop-<25 Ton-Scroll Category: Air-cooled unitary Clg Cap: 10 tons Engy Rate: 11.8 Packaged EER	Plant: Cooling plant - 001 Type: Large Rooftop - Recip Compressor Category: Air-cooled unitary Clg Cap: 115 % Plant Capacity Engy Rate: 9.5 Packaged EER
Cooling Equipment	Plant: Cooling plant - 013 Type: Light Commercial Rooftop-<25 Ton-Scroll Category: Air-cooled unitary Clg Cap: 25 tons Engy Rate: 10.8 Packaged EER	
Cooling Equipment	Plant: Cooling plant - 010 Type: Small Rooftop - Recip Compressor Category: Air-cooled unitary Clg Cap: 4 tons Engy Rate: 12 Packaged EER	
Cooling Equipment	Plant: Cooling plant - 011 Type: Light Commercial Rooftop-<25 Ton-Scroll Category: Air-cooled unitary Clg Cap: 12 tons Engy Rate: 11.8 Packaged EER	
Cooling Equipment	Plant: Cooling plant - 009 Type: Small Rooftop - Recip Compressor Category: Air-cooled unitary Clg Cap: 4 tons Engy Rate: 12 Packaged EER	
Cooling Equipment	Plant: Cooling plant - 001 Type: Large Rooftop - Recip Compressor Category: Air-cooled unitary Clg Cap: 40 tons Engy Rate: 10.8 Packaged EER	

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RESURGAM CITY OF PORTLAND, MAINE
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Section 1.4 - Comparison of Proposed Design Versus Baseline De

Input Parameter	Proposed Design Input	Baseline De
Heat Rejection Parameters	Type: Condenser fan for MZ rooftop HR Type: Air-cooled condenser Energy Consumption: 0.084000 kW/ton Quantity: 6	Type: Condenser fan for MZ roof HR Type: Air-cooled condenser Energy Consumption: 0.084000 kW/ton
Heating Equipment	Plant: Heating plant - 003 Type: 90.1-10 Min Gas Furnace >225 MBh Category: Gas-fired heat exchanger Capacity: 350 Mbh Energy Rate: 80 Percent efficient	Plant: Heating plant - 002 Type: 90.1-07 Min Gas Fired 300-2,500 Mbh No M Category: Boiler Capacity: 125 % Plant Capacity Energy Rate: 80 Percent efficient
Heating Equipment	Plant: Heating plant - 006 Type: 90.1-07 Min Gas Furnace < 225 MBh Category: Gas-fired heat exchanger Capacity: 350 Mbh Energy Rate: 80 Percent efficient	
Heating Equipment	Plant: Heating plant - 005 Type: 90.1-07 Min Gas Furnace < 225 MBh Category: Gas-fired heat exchanger Capacity: 250 Mbh Energy Rate: 80 Percent efficient	
Heating Equipment	Plant: Heating plant - 008 Type: 90.1-07 Min Gas Furnace < 225 MBh Category: Gas-fired heat exchanger Capacity: 350 Mbh Energy Rate: 80 Percent efficient	
Heating Equipment	Plant: Heating plant - 002 Type: 90.1-07 Min Gas Fired 300-2,500 Mbh No M Category: Boiler Capacity: 1100 Mbh Energy Rate: 87 Percent efficient	
Heating Equipment	Plant: Heating plant - 004 Type: 90.1-07 Min Gas Furnace < 225 MBh Category: Gas-fired heat exchanger Capacity: 250 Mbh Energy Rate: 80 Percent efficient	
Heating Equipment	Plant: Heating plant - 007 Type: 90.1-07 Min Gas Furnace < 225 MBh Category: Gas-fired heat exchanger Capacity: 350 Mbh Energy Rate: 80 Percent efficient	
Hot Water Pump	Type: Heating water circ pump Full load consumption: 0.19 Watt/gpm	Type: Heating water circ pump Full load consumption: 0.19 Watt/gpm
Thermal Energy Storage	No	No

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Section 1.5 - Energy Type Summary (Proposed)

Energy Type	Utility Rate Description	Units
Electric Consumption	Brick North Rates	kWh
Electric Demand	Brick North Rates	kW
Gas	Brick North Rates	therms

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Section 1.8.1 Baseline Performance - Performance Rating Method C

End Use	Process	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0 deg rotation)	Baseline (90 deg rotation)	Baselin (180 de rotation		
Lighting - Conditioned	No	Electricity	Energy Use (kWh)	223527.78	223,528	223,528	223528	223,528
			Demand (kW)	48.5	48.5	48.5	48.5	48.5
Space Cooling	No	Electricity	Energy Use (kWh)	118903.07	125,325	118,039	124195	121,616
			Demand (kW)	175.5	179.4	174.6	178.0	176.9
Pumps	No	Electricity	Energy Use (kWh)	141.06	145	148	142	144
			Demand (kW)	0.0	0.0	0.0	0.0	0.0
Heat Rejection	No	Electricity	Energy Use (kWh)	11244.37	11,916	11,156	11803	11,530
			Demand (kW)	17.9	18.3	17.9	18.2	18.1
Fans - Conditioned	No	Electricity	Energy Use (kWh)	55345.59	58,261	54,681	57745	56,508
			Demand (kW)	56.0	57.5	55.8	57.0	56.6
Receptacles - Conditioned	Yes	Electricity	Energy Use (kWh)	86390.82	86,390	86,391	86390	86,390
			Demand (kW)	32.4	32.4	32.4	32.4	32.4
Space Heating	No	Gas	Energy Use (kWh)	1520593.25	1,538,942	1,525,467	1545848	1,532,712
			Demand (kW)	780.2	785.0	779.0	783.8	782.0
Baseline Energy Totals:			**Energy Use (kWh)**	**2,016,146**	**2,044,506**	**2,019,409**	**2,049,651**	**2,032,428**
			Demand (kW)	**1,110.6**	**1,121.2**	**1,108.2**	**1,117.9**	**1,114.5**

Section 1.8.2 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Lighting - Conditioned	No	Electricity	Energy Use (kWh)	223,528
			Demand (kW)	48.5
Space Cooling	No	Electricity	Energy Use (kWh)	78,573
			Demand (kW)	69.4
Pumps	No	Electricity	Energy Use (kWh)	87
			Demand (kW)	0.0
Heat Rejection	No	Electricity	Energy Use (kWh)	9,484
			Demand (kW)	8.0
Fans - Conditioned	No	Electricity	Energy Use (kWh)	169,050
			Demand (kW)	31.9

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Section 1.8.2 Proposed Performance - Performance Rating Method (

End Use	Process	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Receptacles - Conditioned	Yes	Electricity	Energy Use (kWh)	86,422
			Demand (kW)	32.9
Space Heating	No	Gas	Energy Use (kWh)	686,758
			Demand (kW)	370.5
Proposed Energy Totals:			**Energy Use (kWh)**	**1,253,901**
			Demand (kW)	**561.3**

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Table 1.8.2(b) - Proposed Energy Costs

Energy Type	Proposed Cost
Electric Consumption	$ 96,036.00
Gas	$ 27,508.00

Section 1.8.3(a) - Baseline Energy Costs

Energy Type	Baseline Cost (0° rotation)	Baseline Cost (90° rotation)	Baseline Cost (180° rotation)	Baseline Cost (270° rotation)	Average
Electric Consumption	$ 83,959	$ 85,648	$ 83,687	85351.00	$ 84,661
Gas	$ 60,907	$ 61,642	$ 61,102	61918.00	$ 61,392

Proposed building economic cost improvement over baseline building: 15.41 %