

LEED Energy Performance Summary Report

By MFIA Inc.

Section 1.1 - General Information

Simulation Program:	TRACE™ 700 v6.3.2
Principle Heating Source:	Fossil/Electric Hybrid
Energy Code Used:	ASHRAE 90.1-2010
Weather File:	Medford, Oregon TM2 (Full Year - 8760)
Climate Zone:	4C
New Construction Percent:	100 %
Existing Renovation Percent:	0 %
Quantity of Floors:	2
Proposed:	Alternative 1 - Proposed Building
Baseline:	Alternative 2 - ASHRAE Baseline 90.1-10 Climate Zone 4C

Section 1.2 - Space Summary

Building Use (Occupancy Type)	Space Area (ft ²)	Regularly Occupied Area (ft ²)	Unconditioned Area (ft ²)
Group	9,639.00	9,639.00	0.00
Corridor	6,718.00	4,592.00	2,126.00
OFFICE	5,371.00	5,371.00	0.00
Total	21,728.00	19,602.00	2,126.00

Section 1.3 - Advisory Messages

Advisory Messages	Baseline Building (0 deg rotation)	Proposed Building
Number of hours heating load not met:	0	0
Number of hours cooling load not met:	5	0
Total	5	0

LEED Energy Performance Summary Report

By MFIA Inc.

Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Exterior Wall Construction	WoodFrame 2x6 -R21 -Face Brick U-factor: 0.059 Btu/h·ft ² ·°F	90.1-10 Min Wall Nonres Zone 4-8 U-factor: 0.065 Btu/h·ft ² ·°F
Roof Construction	Frame Roof w/ R-38 U-factor: 0.028 Btu/h·ft ² ·°F Reflectivity: 0.10	90.1-10 Min Roof Nonres Zone 4-8 U-factor: 0.048 Btu/h·ft ² ·°F Reflectivity: 0.30
Window-to-gross wall ratio	16.9 %	16.9 %
Fenestration Type	Pella Wood Clad - Sun Defense U-factor: 0.330 Btu/h·ft ² ·°F SHGC: 0.26 Visible Transmissivity: 0.570	90.1 Window Zone 4-6 Metal All Other U-factor: 0.550 Btu/h·ft ² ·°F SHGC: 0.40 Visible Transmissivity: 0.900
Interior Light Power Density	Lighting Compliance: Building Area Method Daylighting Controls: No Building: 0.76 W/ft ²	Lighting Compliance: Building Area Method Daylighting Controls: No Building: 0.90 W/ft ²
Interior Light Power Density	Room Type: Group - 0.76 W/ft ² Corridor - 0.76 W/ft ² OFFICE - 0.76 W/ft ²	Room Type: Group - 0.90 W/ft ² Corridor - 0.90 W/ft ² OFFICE - 0.90 W/ft ²
Slab-on-grade or Exposed Floor	Crawl Space w/ R-30 Exposed Floor U-Factor: 0.034 Btu/h·ft ² ·°F	90.1-10 Min Floor Nonres Zone 4-7 Exposed Floor U-Factor: 0.038 Btu/h·ft ² ·°F
Slab-on-grade or Exposed Floor	12" LW Conc Exposed Floor U-Factor: 0.091 Btu/h·ft ² ·°F	
Receptacle Equip Power Density	1.00 W/ft ²	1.00 W/ft ²
HVAC System Type	Unconditioned - phantom system Ventilation and Heating Supply vol: 0 cfm Fan power: 0.00 kW	System - 005 Teaching Kitchen System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 1245 cfm Fan power: 1.14 kW

LEED Energy Performance Summary Report

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Input Parameter	Proposed Design Input	Baseline Design Input
HVAC System Type	Chilled Beams-second Active Chilled Beams Uses: DB Econ Supply vol: 3188 cfm Fan power: 4.30 kW	System - 007 2nd South-East System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 2542 cfm Fan power: 2.25 kW
HVAC System Type	Chilled Beams-First Active Chilled Beams Uses: DB Econ Supply vol: 2898 cfm Fan power: 2.65 kW	System - 004 1st North East System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 1817 cfm Fan power: 1.66 kW
HVAC System Type		System - 006 2nd South-West System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 2425 cfm Fan power: 2.14 kW
HVAC System Type		System - 009 2nd North East System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 2704 cfm Fan power: 2.39 kW
HVAC System Type		System - 008 2nd North-West System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 1581 cfm Fan power: 1.45 kW
HVAC System Type		System - 002 1st South-East System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 2601 cfm Fan power: 2.30 kW
HVAC System Type		System - 010 unconditioned System 9 - 2010 - Heating Only & Ventilation, Gas Supply vol: 0 cfm Fan power: 0.00 kW
HVAC System Type		System - 001 1st South-West System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 2211 cfm Fan power: 1.96 kW
HVAC System Type		System - 003 1st North West System 3 - 2007/2010 - Packaged Rooftop Air Conditioner Uses: DB Econ Supply vol: 1036 cfm Fan power: 0.95 kW
Cooling Equipment	Plant: Air Cooled Chiller Type: VA Chiller - 40 ton air cooled scroll Category: Air-cooled chiller Clg Cap: Design Engy Rate: 1.04 kW/ton	Plant: Cooling plant - 001 Type: 90.1-10 Min AC SS/SP Other 65-135 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11 Packaged EER

LEED Energy Performance Summary Report

By MFIA Inc.

Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Cooling Equipment		Plant: Cooling plant - 002 Type: 90.1-10 Min AC SS/SP Other 65-135 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11 Packaged EER
Cooling Equipment		Plant: Cooling plant - 003 Type: 90.1-10 Min AC SP AllHeat <65 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11.1 Packaged EER
Cooling Equipment		Plant: Cooling plant - 005 Type: 90.1-10 Min AC SP AllHeat <65 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11.1 Packaged EER
Cooling Equipment		Plant: Cooling plant - 004 Type: 90.1-10 Min AC SP AllHeat <65 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11.1 Packaged EER
Cooling Equipment		Plant: Cooling plant - 008 Type: 90.1-10 Min AC SP AllHeat <65 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11.1 Packaged EER
Cooling Equipment		Plant: Cooling plant - 006 Type: 90.1-10 Min ACHP SS/SP Other 65-135 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 10.8 Packaged EER HR Cap: 14.4 Mbh/ton Engy Rate: 3.3 Packaged COP
Cooling Equipment		Plant: Cooling plant - 007 Type: 90.1-10 Min AC SS/SP Other 65-135 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 11 Packaged EER
Cooling Equipment		Plant: Cooling plant - 009 Type: 90.1-10 Min ACHP SS/SP Other 65-135 MBh Category: Air-cooled unitary Clg Cap: Design Engy Rate: 10.8 Packaged EER HR Cap: 14.4 Mbh/ton Engy Rate: 3.3 Packaged COP
Chilled Water Pump	Type: 90.1 Min CV Chilled Water pump Full load consumption: 2 hp	
Secondary Distribution Pump	Type: Var vol chill water pump Full load consumption: 2.506 hp	

LEED Energy Performance Summary Report

By MFIA Inc.

Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Heat Rejection Parameters	Type: Air cooled Chiller (MFIA-200 ton) HR Type: Air-cooled condenser Energy Consumption: 0.101400 kW/ton	Type: 90.1 Min Air Cooled Condenser HR Type: Air-cooled condenser Energy Consumption: 0.055290 kW/ton Quantity: 9
Heating Equipment	Plant: Steam to Water Converter Type: Purchased District Steam Category: Boiler Capacity: Design Energy Rate: 100 Percent efficient	Plant: Heating plant - 020 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 014 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 015 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 016 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 017 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 018 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 011 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 019 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment		Plant: Heating plant - 012 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient

LEED Energy Performance Summary Report

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Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Heating Equipment		Plant: Heating plant - 013 Type: purchased gas heat Category: Gas-fired heat exchanger Capacity: Design Energy Rate: 100 Percent efficient
Hot Water Pump	Type: 90.1 Min CV Hot Water Pump Full load consumption: 0.75 hp	
Thermal Energy Storage	No	No
Base Utility	Type: Tradable Exterior Lights Description: Tradable Exterior Lights Energy Type: Electricity Hourly Consumption: 0.2 kW Schedule: Outdoor Security Lighting	Type: Tradable Exterior Lights Description: Tradable Exterior Lights Energy Type: Electricity Hourly Consumption: 1.0 kW Schedule: Outdoor Security Lighting
Base Utility	Type: Non-Tradable Exterior Lights Description: Non-Tradable Exterior Lights Energy Type: Electricity Hourly Consumption: 1.7 kW Schedule: Outdoor Security Lighting	Type: Non-Tradable Exterior Lights Description: Non-Tradable Exterior Lights Energy Type: Electricity Hourly Consumption: 1.7 kW Schedule: Outdoor Security Lighting
Base Utility	Type: VA-DHW-purchased Steam Description: VA-DHW-purchased Steam Energy Type: Purchased steam Hourly Consumption: 23.0 Mbh Schedule: Hot Water - Epact - Nonresidential	Type: VA-DHW-purchased Steam Description: VA-DHW-purchased Steam Energy Type: Purchased steam Hourly Consumption: 23.0 Mbh Schedule: Hot Water - Epact - Nonresidential

Section 1.5 - Energy Type Summary (Proposed)

Energy Type	Utility Rate Description	Units
Electric Consumption	VA-203-central steam	kWh
Electric Demand	VA-203-central steam	kW
Purchased Steam	VA-203-central steam	therms

LEED Energy Performance Summary Report

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Section 1.6 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
Space Heating	No	Electricity	Energy Use (kWh)	0	0	0	0	0
			Demand (kW)	0.0	0.0	0.0	0.0	0.0
Space Cooling	No	Electricity	Energy Use (kWh)	47,704	46,285	47,683	47,186	47,215
			Demand (kW)	48.5	45.6	47.6	45.2	46.7
Pumps	No	Electricity	Energy Use (kWh)	0	0	0	0	0
			Demand (kW)	0.0	0.0	0.0	0.0	0.0
Heat Rejection	No	Electricity	Energy Use (kWh)	3,772	3,721	3,785	3,800	3,769
			Demand (kW)	3.7	3.6	3.6	3.6	3.6
Fans - Interior	No	Electricity	Energy Use (kWh)	87,502	87,265	85,964	88,398	87,282
			Demand (kW)	16.2	16.2	15.9	16.4	16.2
Receptacle Equipment	Yes	Electricity	Energy Use (kWh)	99,935	99,935	99,935	99,935	99,935
			Demand (kW)	18.6	18.6	18.6	18.6	18.6
Interior Lighting	No	Electricity	Energy Use (kWh)	89,941	89,941	89,941	89,941	89,941
			Demand (kW)	16.8	16.8	16.8	16.8	16.8
Tradable Exterior Lights - Base Utility	Yes	Electricity	Energy Use (kWh)	4,560	4,560	4,560	4,560	4,560
			Demand (kW)	1.0	1.0	1.0	1.0	1.0
Non-Tradable Exterior Lights - Base Utility	Yes	Electricity	Energy Use (kWh)	8,123	8,123	8,123	8,123	8,123
			Demand (kW)	1.7	1.7	1.7	1.7	1.7
Space Heating	No	Purchased Steam	Energy Use (therms)	597	610	630	605	610
			Demand (therms)	1.6	1.6	1.6	1.6	1.6
VA-DHW-purchased Steam - Base Utility	Yes	Purchased Steam	Energy Use (therms)	530	530	530	530	530
			Demand (therms)	0.2	0.2	0.2	0.2	0.2
Baseline Energy Totals:			Energy Use (MMBtu/yr)	1,278.4	1,273.8	1,276.4	1,280.5	1,277.3
			Process (MMBtu/yr)	437.4	437.4	437.4	437.4	437.4

Section 1.6 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Proposed Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Space Heating	No	Electricity	Energy Use (kWh)	100
			Demand (kW)	0.0

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Section 1.6 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Proposed Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Space Cooling	No	Electricity	Energy Use (kWh)	34,689
			Demand (kW)	33.9
Pumps	No	Electricity	Energy Use (kWh)	16,849
			Demand (kW)	4.6
Heat Rejection	No	Electricity	Energy Use (kWh)	6,622
			Demand (kW)	5.8
Fans - Interior	No	Electricity	Energy Use (kWh)	38,949
			Demand (kW)	7.0
Receptacle Equipment	Yes	Electricity	Energy Use (kWh)	99,935
			Demand (kW)	18.6
Interior Lighting	No	Electricity	Energy Use (kWh)	75,950
			Demand (kW)	14.2
Tradable Exterior Lights - Base Utility	Yes	Electricity	Energy Use (kWh)	807
			Demand (kW)	0.2
Non-Tradable Exterior Lights - Base Utility	Yes	Electricity	Energy Use (kWh)	8,123
			Demand (kW)	1.7
Space Heating	No	Purchased Steam	Energy Use (therms)	1,143
			Demand (therm)	1.6
VA-DHW-purchased Steam - Base Utility	Yes	Purchased Steam	Energy Use (therms)	530
			Demand (therm)	0.2
Proposed Energy Totals:			Energy Use (MMBtu/yr)	1,129.91
			Process (MMBtu/yr)	424.58

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Table 1.6 Table EAp2-9 Energy Cost Summary (Manual Cost Input) - Baseline Case

Energy Type	Baseline Cost (0° rotation)	Baseline Cost (90° rotation)	Baseline Cost (180° rotation)	Baseline Cost (270° rotation)	Average
Electric Consumption	\$27,740	\$27,486	\$27,587	\$27,621	\$27,609
Purchased Steam	\$1,491	\$1,508	\$1,534	\$1,502	\$1,509

Table 1.6 Table EAp2-9 Energy Cost Summary (Manual Cost Input) - Proposed Case

Energy Type	Proposed Cost
Electric Consumption	\$22,749
Purchased Steam	\$2,214

Proposed building economic cost improvement over baseline building: 14.26 %