(Responsible Individual) (Company Name)

I, , from

verify that the information provided below is accurate, to the best of my knowledge.

CREDIT COMPLIANCE

The project meets the minimum energy efficiency requirements.

The project meets all the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4) of ASHRAE/IESNA Standard 90.1-2004 (without amendments). ☒

-- AND --

Select the appropriate compliance path:

The prescriptive requirements (Sections 5.5, 6.5, 7.5, and 9.5) of ASHRAE 90.1-2004 (without amendments) ☐

-- OR --

The performance requirements (Section 11) of ASHRAE/IESNA Standard 90.1-2004 (without amendments) ☐

-- OR --

The project has used a computer simulation model to document improved building energy performance under EA Credit 1 ☒

NARRATIVE (Optional)

Please provide any additional comments or notes regarding special circumstances or considerations regarding the project's credit approach.

☐ The project is seeking point(s) for this credit using an alternate compliance approach. The compliance approach, including references to any applicable Credit Interpretation Rulings is fully documented in the narrative above.

BETA

LEED for Schools 2007 Submittal Template
EA Prerequisite 2: Minimum Energy Performance

design

Project Name: Hood River Middle School Music/Science

Credit: EA Prerequisite 2: Minimum Energy Performance

Points Documented: Y

READY TO SAVE THIS TEMPLATE TO LEED-ONLINE? Please enter your first name, last name and today's date below, followed by your LEED-Online Username and Password associated with the Project listed above to confirm submission of this template.

First Name	Last Name	Date	Username (Email Address)	Password
		2009-11-16		

SAVE TEMPLATE TO LEED-ONLINE | PRINT TEMPLATE

Letter Template Version A6 : 10000812

BETA

LEED for Schools 2007 Submittal Template
EA Credit 1: Optimize Energy Performance

(Responsible Individual) (Company Name)

I, [redacted], from [redacted]
verify that the information provided below is accurate, to the best of my knowledge.

CREDIT COMPLIANCE

◉ Performance Rating Method, ASHRAE 90.1-2004 Appendix G or equivalent (up to 10 points possible, 2 points required)

PERFORMANCE RATING METHOD

☒ I confirm that the energy simulation software used for this project has all capabilities described in EITHER section `G2 Simulation General Requirements' in Appendix G of ASHRAE 90.1-2004 OR the analogous section of the alternative qualifying energy code used.

☒ I confirm that the baseline building and proposed building in this project's energy simulation runs use the assumptions and modeling methodology described in EITHER Appendix G of ASHRAE 90.1-2004 OR the analogous section of the alternative qualifying energy code used.

Complete the following sections to document compliance :

- Section 1.1 - General Information
- Section 1.2 - Space Summary
- Section 1.3 - Advisory Messages
- Section 1.4 - Comparison of Proposed Design Versus Baseline Design Energy Model Inputs
- Section 1.5 - Energy Type Summary
- Section 1.6 - On-Site Renewable Energy *(if applicable)*
- Section 1.7 - Exceptional Calculation Measure Summary *(if applicable)*
- Section 1.8 - Performance Rating Method Compliance Report

Section 1.1 - General Information

Provide the following data for your project

Simulation Program:	eQUEST v3.63	Quantity of Stories:	1
Principal Heating Source:	Electricity	Weather File:	Hood River, OR
Energy Code Used:	ASHRAE 90.1-2004 Appendix G	Climate Zone:	4C
New Construction Percent:	100 %	Existing Renovation Percent:	0 %

Enter the Target Finder score for your building from the Energy Star website (http://www.energystar.gov/index.cfm?fuseaction=target_finder.&CFID=154897). The score has no bearing on the number of EAc1 points earned. Use the following process to evaluate the Target Finder score:

1. Enter the facility information
2. Enter the facility characteristics. Select each primary and secondary space type that applies to the project. Then complete the required information for each space type.
4. Enter the total energy use per energy source for your project based on the totals reflected in the Proposed Design energy simulation output report.

Target Finder Score: 51

Section 1.2 - Space Summary

Provide the space summary for your project
(click "CLEAR" to clear the contents of any row All numeric entries must be entered as whole numbers without commas):

Table 1.2 - Space Summary

Building Use (Occupancy Type)	Conditioned Area (sf)	Unconditioned Area (sf)	Total Area (sf)	
Middle School Classroom Building	5,331		5,331	CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
				CLEAR
Total:	5,331		5,331	

Section 1.3 - Advisory Messages

Complete the following information from the simulation output files (all entries should be entered as whole numbers, without commas)

TABLE 1.3 - Advisory Messages	Proposed Building	Baseline Building (0 deg. rotation)	Difference
Number of hours heating loads not met:	96	131	35
Number of hours cooling loads not met:	0	0	0
Number of warning messages:	0	0	0
Number of error messages:	0	0	0
Number of defaults overridden:	0	0	0

Section 1.4 - Comparison of Proposed Design Versus Baseline Design Energy Model Inputs

Use **Table 1.4** to document the Baseline and Proposed design energy model inputs for your project. Include descriptions for:

1. Exterior wall, underground wall, roof, floor, and slab assemblies including framing type, assembly R-values, assembly U-factors, and roof reflectivity when modeling cool roofs. (Refer to ASHRAE 90.1 Appendix A)
2. Fenestration types, assembly U-factors (including the impact of the frame on the assembly), SHGCs, and visual light transmittances, overall window-to-gross wall ratio, fixed shading devices, and automated movable shading devices.
3. Interior lighting power densities, exterior lighting power, process lighting power, and lighting controls modeled for credit.
4. Receptacle equipment, elevators or escalators, refrigeration equipment, and other process loads.
5. HVAC system information including types and efficiencies, fan control, fan supply air volume, fan power, economizer control, demand control ventilation, exhaust heat recovery, pump power and controls, and any other pertinent system information. (Include the ASHRAE 90.1-2004 Table G.3.1.1B Baseline System Number).
6. Domestic hot water system type, efficiency and storage tank volume.
7. General schedule information

Documentation should be sufficient to justify the energy and cost savings numbers reported in the Performance Rating Table.

(Click "CLEAR" to clear the contents of any row.)

TABLE 1.4 - Comparison of Proposed Design Versus Baseline Design

Model Input Parameter	Proposed Design Input	Baseline Design Input	
Exterior Wall Construction	Insulated concrete forms (ICFs) with 5" rigid foam insulation and brick cladding (U-0.04)	Steel Framed Wall with R-13 Batt Insulation, U-0.124	CLEAR
Roof Construction	5" rigid polyisocyanurate (R-38) over roof deck (U-0.025)	Insulation Entirely Above Deck with R-15 board insulation, U-0.063	CLEAR
Floor/Slab Construction	3" rigid polystyrene (R-15) under heated slabs	Unheated Slab floor, F-0.73	CLEAR
Window-to-gross wall ratio	29%	29%	CLEAR
Fenestration type	Clear, triple-pane argon-filled glazing in wood framed windows	Clear, double-pane glazing in thermally-broken aluminum frame	CLEAR
Fenestration U-factor	Ufactor - 0.30	Ufactor - 0.57	CLEAR
Fenestration SHGC - All	SHGC - 0.30	SHGC - 0.39	CLEAR
Fenestration Visual Light Transmittance	VLT - 0.38	VLT - 0.70	CLEAR
Shading Devices	None	Not modelled	CLEAR
Interior Lighting Power Density (W/sf)	Space-by-space method: Classrooms: 0.8 W/sf Offices: 0.5 W/sf	Space-by-space method: Classrooms: 1.4 W/sf Offices: 1.1 W/sf	CLEAR
			CLEAR
			CLEAR

TABLE 1.4 - Comparison of Proposed Design Versus Baseline Design

Model Input Parameter	Proposed Design Input	Baseline Design Input	
Daylighting Controls	Continuous dimming ballasts down to 5% in classrooms	Not Modelled	CLEAR
Other Lighting Control Credits	None	None	CLEAR
Exterior Lighting Power (kW)	0.781 kW for entrance sidewalk and stairway	1.0 kW for 128' long entrance sidewalk less than 10' wide and 800 sf stairway	CLEAR
Process Lighting (kW)	None	None	CLEAR
Receptacle Equipment Power Density (W/sf)	Classrooms: 1.5 W/sf Science Classroom: 2.5 W/sf Offices: 1.25 W/sf	Same as proposed	CLEAR
Domestic Hot Water Heater	Electric, 66-gallon, 9000 W	Same as proposed	CLEAR
Primary HVAC System Type	Ground-source water-to-water heat pumps serving radiant heating/cooling slabs in all spaces	Packaged single zone rooftop heat pumps	CLEAR
Other HVAC System Type	Ventilation air provided by rooftop heat recovery ventilators with hot water coils.	None	CLEAR
Fan Supply Volume	HRV-1: 1000 CFM HRV-2: 1000 CFM Total: 2000 CFM	Total Supply: 8,050 CFM	CLEAR
Fan Power	HRV-1,2: 0.000784 kW/cfm	Calculated using fan power calculation from AppG 90.1-2004. Ranges from 0.001219 kW/cfm down to 0.000746 kW/cfm depending on system	CLEAR
Economizer Control	Economizer up to 70 deg F	Not required	CLEAR
Demand Control Ventilation	CO2 zone sensors in music and science classrooms	Not required	CLEAR
Unitary Equipment Cooling Efficiency	GSHP-1/2: EER - 18.7	Units <65,000 Btu/h: 12.0 SEER Units >65,000, <135,000: 9.9 EER	CLEAR
Unitary Equipment Heating Efficiency	GSHP-1/2: COP 5.7	Units <65,000 Btu/h: 7.4 HSPF Units >65,000, <135,000: 3.2 COP	CLEAR
Chilled water loop & pump parameters	45 F LWT, 55 F EWT (blended for radiant slabs) P-1/2: 33 GPM @ 40 ft head Radiant zone circulation pumps: 20 GPM @ 30 ft	N/A	CLEAR
Hot water loop & pump parameters	85 F LWT, 75 F EWT P-1/2 used for heating and cooling	N/A	CLEAR
Condenser water loop & pump parameters	Geothermal loop: 30 EWT/40 LWT in heating, 80 EWT/ 70 LWT in cooling Geothermal loop pumps P-3/4: 11 GPM @ 55 ft	N/A	CLEAR
			CLEAR
			CLEAR
			CLEAR
			CLEAR

Section 1.5 - Energy Type Summary

List the energy types used by your project (i.e. electricity, natural gas, purchased chilled water or steam, etc.) for either the Baseline or Proposed design. Also describe the utility rate used for each energy type (i.e. Feswick County Electric LG-S), as well as the units of energy used, and the units of demand used. (Click "CLEAR" to clear the contents of any row):

TABLE 1.5 - Energy Type Summary

Energy Type	Utility Rate Description	Units of Energy	Units of demand	
Electricity	Pacific Power and Light Rate Sche	kWh	kW	CLEAR
				CLEAR
				CLEAR
				CLEAR

Energy Units:

1 kBtu = 1,000 Btu
1 kWh = 3.412 kBtu
1 therm = 100 kBtu
1 MBtu = 1,000 kBtu
1 MWh = 3,412 kBtu
1 ton hr = 12 kBtu

Demand Units

1 MBH = 1,000 Btu/h
1 kW = 3.412 MBH
1 MMBtuh = 1,000 MBH
1 ton = 12 MBH

Section 1.6 - On-Site Renewable Energy

If the project does not include on-site renewable energy, skip to Section 1.7

☒ The project includes On-Site Renewable Energy

How is the on-site renewable energy cost calculated?

- ◉ This form will automatically calculate the *Renewable Energy Cost* based on the "virtual" energy rate from the proposed design energy model results. This form will subtract the *Renewable Energy Cost* from the proposed design energy model results to calculate the *Proposed Building Performance Rating.* (You do NOT need to fill out the "Renewable Energy Cost" field in Table 1.6 below)
- ○ *Renewable Energy Cost* for each on-site renewable source is analyzed separately from the energy model based on local utility rate structures. The *Renewable Energy Cost* for each renewable source is reported in Table 1.6 below, This form will subtract the reported *Renewable Energy Cost* from the proposed design energy model results to calculate the *Proposed Building Performance Rating.*
- ○ On-site renewable energy is modeled directly in the energy model. *Renewable Energy Cost* is already credited in the proposed design energy model results (i.e. the energy model already reflects zero cost for on-site renewable energy, and this form will NOT subtract the *Renewable Energy Cost* a second time).aa

Indicate the on-site renewable energy source(s) used, the backup energy type for each source (i.e. the fuel that is used when the renewable energy source is unavailable - ASHRAE 90.1-2004, Section G2.4), the rated capacity for the source, and the annual energy generated from each source.

TABLE 1.6 - Renewable Energy Source Summary

Renewable Source	Backup Energy Type	Annual Energy Generated		Rated Capacity	Renewable Energy Cost	
Photovoltaic Array	Electricity	33,484	(kWh)	35.3 kW	$3,984	CLEAR
						CLEAR

Section 1.7 - Exceptional Calculation Measure Summary

(If the energy analysis does not include exceptional calculation methods, skip to Section 1.8)

☐ The energy analysis includes exceptional calculation method(s) (ASHRAE 90.1-2004, G2.5)

How is the exceptional calculation measure cost savings determined?

◉ This form will automatically calculate the exceptional calculation measure cost savings based on the "virtual" energy rate from the proposed design energy model results. This form will subtract this cost savings from the proposed design energy model results to calculate the *Proposed Building Performance Rating*.

○ Exceptional calculation measure cost for each exceptional calculation measure is analyzed based on local utility rate structures. The *cost savings* for each exceptional calculation is reported below, This form will subtract the reported exceptional calculation cost savings from the proposed design energy model results to calculate the *Proposed Building Performance Rating*.

For each exceptional calculation method employed, document the predicted energy savings by energy type , the energy cost savings (if option 2 above is selected), and a narrative explaining the exceptional calculation method performed, and theoretical or empirical information supporting the accuracy of the method. Reference any applicable Credit Interpretation Rulings. [Note: if an end-use has an energy loss rather than an energy savings, enter it as a negative number]

Exceptional Calculation Measure Short Description: CLEAR

Energy Type(s)	Annual Energy Savings by Energy Type	Annual Cost Savings

Exceptional Calculation Measure Narrative:

Exceptional Calculation Measure Short Description: CLEAR

Energy Type(s)	Annual Energy Savings by Energy Type	Annual Cost Savings

Exceptional Calculation Measure Narrative:

Section 1.8 - Performance Rating Method Compliance Report

In **Table 1.8.1**, list each energy end use for your project (including all end uses reflected in the baseline and proposed designs). Then check whether the end-use is a process load, select the energy type, and list the energy consumption and peak demand for each end-use for all four Baseline Design orientations. In **Table 1.8.1(b)** indicate the total baseline energy cost for each energy type for all four Baseline Design orientations. If either the baseline or proposed design uses more than one energy type for a single end use (i.e. electric resistance reheat, and central natural gas heating), enter each energy type as a separate end use (i.e. *Heating - Electric*, and *Heating, NG*).

Fill out the Proposed Design energy consumption and peak demand for each end use in **Table 1.8.2.** In **Table 1.8.2 (b)** indicate the total proposed energy cost for each energy type. [Note: Process loads for the proposed design must equal those listed in the Baseline design. Any process load energy savings for the project must be reported in Section 1.7.]

(Click "CLEAR" to clear the contents of any end use)

Table 1.8.1 - Baseline Performance - Performance Rating Method Compliance

End Use	Process?	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0° rotation)	Baseline (90° rotation)	Baseline (180° rotation)	Baseline (270° rotation)	Baseline Design	
Interior Lighting	☐	Electricity	Energy Use (kWh)	18,386		18,386	18,386	18,386	CLEAR
			Demand (kW)	6.2		6.2	6.2	6.2	
Exterior Lighting	☐	Electricity	Energy Use (kWh)	4,192	4,192	4,192	4,192	4,192	CLEAR
			Demand (kW)	.4	.4	.4	.4	.4	
Space Heating	☐	Electricity	Energy Use (kWh)	13,492	13,911	13,500	13,209	13,528	CLEAR
			Demand (kW)			13.6	13.1	13.5	
Space Cooling	☐	Electricity	Energy Use (kWh)	2,644	2,522	2,662	2,676	2,626	CLEAR
			Demand (kW)	8.8	8.7	8.7	8.7	8.7	
Pumps	☐	Electricity	Energy Use (kWh)	1,785	1,785	1,787	1,788	1,786.3	CLEAR
			Demand (kW)	.1	.1	.1	.1	.1	
Fans - Interior	☐	Electricity	Energy Use (kWh)	19,012	19,178	19,477	19,293	19,240	CLEAR
			Demand (kW)	6.3	6.3	6.4	6.4	6.3	
Service Water Heating	☐	Electricity	Energy Use (kWh)	3,219	3,220	3	3,221	3,220	CLEAR
			Demand (kW)	.4	.4	.4	.4	.4	
Receptacle Equipment	☒	Electricity	Energy Use (kWh)	9,549	9,549	9,549	9,549	9,549	CLEAR
			Demand (kW)	3.3	3.3	3.3	3.3	3.3	
	☐		Energy Use						CLEAR
			Demand						
	☐		Energy Use						CLEAR
			Demand						

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LEED for Schools 2007 Submittal Template
EA Credit 1: Optimize Energy Performance

Table 1.8.1 - Baseline Performance - Performance Rating Method Compliance

End Use	Process?	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0° rotation)	Baseline (90° rotation)	Baseline (180° rotation)	Baseline (270° rotation)	Baseline Design	
	☐		Energy Use						CLEAR
			Demand						
	☐		Energy Use						CLEAR
			Demand						
	☐		Energy Use						CLEAR
			Demand						
	☐		Energy Use						CLEAR
			Demand						
	☐		Energy Use						CLEAR
			Demand						
	☐		Energy Use						CLEAR
			Demand						
Baseline Energy Totals:		Total Annual Energy Use (kBtu/year)		246,613	248,198	248,302	246,736	247,464	
		Annual Process Energy (kBtu/year)						32,581	

Note: Process Cost accounts for 13% of Baseline Performance. Process cost must equal at least 25% of Baseline Performance, or the narrative at the end of this form must document why this building's process costs are less than 25%

Table 1.8.1(b) - Baseline Energy Costs

Energy Type	Baseline Cost (0° rotation)	Baseline Cost (90° rotation)	Baseline Cost (180° rotation)	Baseline Cost (270° rotation)	Baseline Building Performance
Electricity	$5,746	$5,749	$5,771	$5,777	$5,760
Total Baseline Costs:	$5,746	$5,749	$5,771	$5,777	$5,760

Table 1.8.2 - Performance Rating Table - Performance Rating Method Compliance

End Use	Process?	Proposed Design Energy Type	Proposed Design Units	Proposed Building Results	Baseline Building Units	Baseline Building Results	Percent Savings
Interior Lighting		Electricity	Energy Use (kWh)	9,225	Energy Use (kWh)	18,386	49.8 %
			Demand (kW)	4.1	Demand (kW)	6.2	38.1 %

Exterior Lighting		Electricity	Energy Use (kWh)	2,469	Energy Use (kWh)	4,192	41.1	%
			Demand (kW)	.2	Demand (kW)	.4	0	%
Space Heating		Electricity	Energy Use (kWh)	4,227	Energy Use (kWh)	13,528	68.8	%
			Demand (kW)		Demand (kW)	13.5	43.5	%
Space Cooling		Electricity	Energy Use (kWh)	1,022	Energy Use (kWh)	2,626	61.1	%
			Demand (kW)	4.7	Demand (kW)	8.7	44.8	%
Pumps		Electricity	Energy Use (kWh)	2,503	Energy Use (kWh)	1,786.3	-40.1	%
			Demand (kW)	1.2	Demand (kW)	.1	0	%
Fans - Interior		Electricity	Energy Use (kWh)	2,503	Energy Use (kWh)	19,240	87	%
			Demand (kW)	1.2	Demand (kW)	6.3	81	%
Service Water Heating		Electricity	Energy Use (kWh)	1,987	Energy Use (kWh)	3,220	38.3	%
			Demand (kW)		Demand (kW)	.4	0	%
Receptacle Equipment	X	Electricity	Energy Use (kWh)	9,549	Energy Use (kWh)	9,549	0	%
			Demand (kW)	2.7	Demand (kW)	3.3	18.2	%
		Electricity	Energy Use (kWh)		Energy Use		0	%
			Demand (kW)		Demand		0	%
		Electricity	Energy Use (kWh)		Energy Use		0	%
			Demand (kW)		Demand		0	%
		Electricity	Energy Use (kWh)		Energy Use		0	%
			Demand (kW)		Demand		0	%
		Electricity	Energy Use (kWh)		Energy Use		0	%
			Demand (kW)		Demand		0	%
		Electricity	Energy Use (kWh)		Energy Use		0	%
			Demand (kW)		Demand		0	%
			Energy Use		Energy Use		0	%
			Demand		Demand		0	%
		Electricity	Energy Use (kWh)		Energy Use		0	%
			Demand (kW)		Demand		0	%
			Energy Use		Energy Use		0	%
			Demand		Demand		0	%
Energy Totals:		Total Annual Energy Use (kBtu/year)		114,248		247,464	53.8	%
		Annual Process Energy (kBtu/year)		32,581		32,581	0	%

Table 1.8.2(b) - Energy Cost and Consumption by Energy Type - Performance Rating Method Compliance

Energy Type	Proposed Design		Baseline Design		Percent Savings	
	Energy Use	Cost	Energy Use	Cost	Energy Use	Cost
Electricity	33,485 kWh	$3,834	72,527 kWh	$5,760	53.8 %	33.4 %
	0		0		0 %	0 %
	0		0		0 %	0 %
	0		0		0 %	0 %
Subtotal (Model Outputs):	114,248 (kBtu/year)	$3,834	247,464 (kBtu/year)	$5,760	53.8 %	33.4 %

On-Site Renewable Energy	Energy Generated	Renewable Energy Cost	
Photovoltaic Array	33,484 (kWh)	$3,833	(subtracted from model results to reflect Proposed Building Performance)
		0	(subtracted from model results to reflect Proposed Building Performance)

Exceptional Calculations	Energy Savings	Cost Savings	

	Proposed Design		Baseline Design		Percent Savings	
	Energy Use	Cost	Energy Use	Cost	Energy	Cost
Total:	1 (kBtu/year)	$1	247,464 (kBtu/year)	$5,760	100 %	100 %