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Envelope Compliance Certifi

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 01/11/16

PETER LEE No.12156 LICENSED PROFESSIONAL ENGINEER

Nov. 11, 2015

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: VGM-2015-002
Project Type: New Construction

Construction Site:
28'x76' CLASSROOM BLDG
Portland, ME

Owner/Agent:

Designer/Contractor:
Psi-Peter Lee, P.E.
Elkhart, IN

Building Location (for weather data): Portland, Maine
Climate Zone: 6a
Vertical Glazing / Wall Area Pct.: **8%**

Building Use: Activity Type(s)	Floor Area
1-School/University : Nonresidential	2128

Section 2: Envelope Assemblies and Requirements Checklist

Envelope PASSES: Design 1% better than code.

Envelope Assemblies:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Roof 1: Attic Roof with Wood Joists, [Bldg. Use 1 - School/University]	2128	38.0	0.0	0.027	0.027
Exterior Wall 1: Wood-Framed, 16" o.c., [Bldg. Use 1 - School/University]	224	19.0	0.0	0.067	0.051
Window 1: Vinyl Frame:Double Pane with Low-E, Perf. Specs.: Product ID ****, SHGC 0.28, [Bldg. Use 1 - School/University] (b)	16	---	---	0.280	0.350
Exterior Wall 2: Wood-Framed, 16" o.c., [Bldg. Use 1 - School/University]	224	19.0	0.0	0.067	0.051
Window 2: Vinyl Frame:Double Pane with Low-E, Perf. Specs.: Product ID ****, SHGC 0.28, [Bldg. Use 1 - School/University] (b)	16	---	---	0.280	0.350
Exterior Wall 3: Wood-Framed, 16" o.c., [Bldg. Use 1 - School/University]	544	19.0	0.0	0.067	0.051
Window 3: Vinyl Frame:Double Pane with Low-E, Perf. Specs.: Product ID ****, SHGC 0.28, [Bldg. Use 1 - School/University] (b)	96	---	---	0.280	0.350
Door 1: Insulated Metal, Swinging, [Bldg. Use 1 - School/University]	40	---	---	0.350	0.700
Exterior Wall 4: Wood-Framed, 16" o.c., [Bldg. Use 1 - School/University]	544	19.0	0.0	0.067	0.051
Door 2: Insulated Metal, Swinging, [Bldg. Use 1 - School/University]	20	---	---	0.350	0.700
Floor 1: Wood-Framed, [Bldg. Use 1 - School/University]	2128	30.0	0.0	0.033	0.033

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

- ☐ 1. All joints and penetrations are caulked, gasketed or covered with a moisture vapor-permeable wrapping material installed in accordance with the manufacturer's installation instructions.
- ☐ 2. Windows, doors, and skylights certified as meeting leakage requirements.
- ☐ 3. Component R-values & U-factors labeled as certified.
- ☐ 4. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- ☐ 5. 'Other' components have supporting documentation for proposed U-Factors.

- ❑ 6. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being ins achieves the rated R-value without compressing the insulation.
- ❑ 7. Stair, elevator shaft vents, and other outdoor air intake and exhaust openings in the building envelope are e dampers.
- ❑ 8. Cargo doors and loading dock doors are weather sealed.
- ❑ 9. Recessed lighting fixtures installed in the building envelope are Type IC rated as meeting ASTM E283, are
- ❑ 10. Building entrance doors have a vestibule equipped with self-closing devices.

  Exceptions:

  - ❑ Building entrances with revolving doors.
  - ❑ Doors not intended to be used as a building entrance.
  - ❑ Doors that open directly from a space less than 3000 sq. ft. in area.
  - ❑ Doors used primarily to facilitate vehicular movement or materials handling and adjacent personnel doors.
  - ❑ Doors opening directly from a sleeping/dwelling unit.

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Section 3: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title	Signature	Date

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Nov. 11, 2015

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Interior Lighting Compliance Certificate

Reviewed for Code Compliance
Inspections Division
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Date: 01/11/16

No.12156 LICENSED PROFESSIONAL ENGINEER

Nov. 11, 2015

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: VGM-2015-002
Project Type: New Construction

Construction Site:
28'x76' CLASSROOM BLDG
Portland, ME

Owner/Agent:

Designer/Contractor
Psi-Peter Lee, P.E.
Elkhart, IN

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
School/University	2128	1.2	2554
		Total Allowed Watts =	2554

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
School/University (2128 sq.ft.)				
Linear Fluorescent 1: 48" T8 32W (Super T8): Electronic:	2	32	54	1728
Compact Fluorescent 1: Spiral 27W: Electronic:	1	5	28	140
		Total Proposed Watts =		1868

Section 4: Requirements Checklist

Interior Lighting PASSES: Design 27% better than code.

Lighting Wattage:

☐ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
2554	1868	YES

Controls, Switching, and Wiring:

☐ 2. Daylight zones under skylights more than 15 feet from the perimeter have lighting controls separate from daylight zones adjacent to vertical fenestration.

☐ 3. Daylight zones have individual lighting controls independent from that of the general area lighting.

Exceptions:

☐ Contiguous daylight zones spanning no more than two orientations are allowed to be controlled by a single controlling device.

☐ Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

☐ 4. Independent controls for each space (switch/occupancy sensor).

Exceptions:

☐ Areas designated as security or emergency areas that must be continuously illuminated.

☐ Lighting in stairways or corridors that are elements of the means of egress.

☐ 5. Master switch at entry to hotel/motel guest room.

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- ☐ 6. Individual dwelling units separately metered.
- ☐ 7. Medical task lighting or art/history display lighting claimed to be exempt from compliance has a control devi of the nonexempt lighting.
- ☐ 8. Each space required to have a manual control also allows for reducing the connected lighting load by at lea controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate la lamp luminaires independently of other lamps, or switching each luminaire or each lamp.

  Exceptions:

  - ☐ Only one luminaire in space.
  - ☐ An occupant-sensing device controls the area.
  - ☐ The area is a corridor, storeroom, restroom, public lobby or sleeping unit.
  - ☐ Areas that use less than 0.6 Watts/sq.ft.
- ☐ 9. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

  Exceptions:

  - ☐ Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.
- ☐ 10. Photocell/astronomical time switch on exterior lights.

  Exceptions:

  - ☐ Lighting intended for 24 hour use.
- ☐ 11. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

  Exceptions:

  - ☐ Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.1 and to comply with the mandatory requirements in the Requirements Checklist.

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Exterior Lighting Compliance Certificate

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Nov. 11, 2015

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: VGM-2015-002
Project Type: New Construction
Exterior Lighting Zone: 2 (Neighborhood business district)

Construction Site:
28'x76' CLASSROOM BLDG
Portland, ME

Owner/Agent:

Designer/Contractor:
Psi-Peter Lee, P.E.
Elkhart, IN

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Main entry	3 ft of door width	20	Yes	60	28
Other door (not main entry)	3 ft of door width	20	Yes	60	28
Other door (not main entry)	3 ft of door width	20	Yes	60	28
			Total Tradable Watts* =	180	84
			Total Allowed Watts =	180	
			Total Allowed Supplemental Watts** =	600	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Main entry (3 ft of door width): Tradable Wattage				
Compact Fluorescent 1: Spiral 27W: Electronic:	1	1	28	28
Other door (not main entry) (3 ft of door width): Tradable Wattage				
Compact Fluorescent 2: Spiral 27W: Electronic:	1	1	28	28
Other door (not main entry) (3 ft of door width): Tradable Wattage				
Compact Fluorescent 3: Spiral 27W: Electronic:	1	1	28	28
			Total Tradable Proposed Watts =	84

Section 4: Requirements Checklist

Lighting Wattage:

☐ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.
Compliance: Passes.

Controls, Switching, and Wiring:

☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.

☐ 3. Lighting not designated for dusk-to-dawn operation is controlled by either a a photosensor (with time switch), or an astronomical time switch.

- ❑ 4. Lighting designated for dusk-to-dawn operation is controlled by an astronomical time switch or photosensor
- ❑ 5. All time switches are capable of retaining programming and the time setting during loss of power for a perio

Exterior Lighting Efficacy:

- ❑ 6. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lum

Exceptions:

- ❑ Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
- ❑ Lighting that is specifically designated as required by a health or life safety statue, ordinance, or regulati
- ❑ Emergency lighting that is automatically off during normal building operation.
- ❑ Lighting that is controlled by motion sensor.

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Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title	Signature	Date

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Mechanical Compliance Certi

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Date: 01/11/16

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: VGM-2015-002
Project Type: New Construction

Construction Site:
28'x76' CLASSROOM BLDG
Portland, ME

Owner/Agent:

Designer/Contractor:
Psi-Peter Lee, P.E.
Elkhart, IN

Section 2: General Information

Building Location (for weather data): Portland, Maine
Climate Zone: 6a

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Section 3: Mechanical Systems List

Quantity	System Type & Description
1	HVAC System 1 (Single Zone) : Heating: 1 each - Radiant Heater, Gas, Capacity = 31 kBtu/h No minimum efficiency requirement applies Fan System: None
1	Water Heater 1: Electric Instantaneous Water Heater, Capacity: 0 gallons w/ Heat Trace Tape Installed No minimum efficiency requirement applies

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1 :

None

Requirements Specific To: Water Heater 1 :

- ☐ 1. Water heating equipment meets minimum efficiency requirements: No efficiency requirements for electric instantaneous water heater.
- ☐ 2. First 8 ft of outlet piping is insulated
- ☐ 3. All heat traced or externally heated piping insulated
- ☐ 4. Automatic time control of heat tapes and recirculating systems present

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- ☐ 1. Plant equipment and system capacity no greater than needed to meet loads
  Exception(s):
  - ☐ Standby equipment automatically off when primary system is operating
  - ☐ Multiple units controlled to sequence operation as a function of load
- ☐ 2. Minimum one temperature control device per system
- ☐ 3. Minimum one humidity control device per installed humidification/dehumidification system
- ☐ 4. Load calculations per ASHRAE/ACCA Standard 183.
- ☐ 5. Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
  Exception(s):
  - ☐ Continuously operating zones
- ☐ 6. Outside-air source for ventilation; system capable of reducing OSA to required minimum
- ☐ 7. Hot water pipe insulation: 1.5 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in.

Chilled water/refrigerant/brine pipe insulation: 1.5 in. for pipes <=1.5 in. and 1.5 in. for pipes >1.5 in.
Steam pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.

Exception(s):

- ❑ Piping within HVAC equipment.
- ❑ Fluid temperatures between 55 and 105°F.
- ❑ Fluid not heated or cooled with renewable energy.
- ❑ Piping within room fan-coil (with AHRI440 rating) and unit ventilators (with AHRI840 rating).
- ❑ Runouts <4 ft in length.

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❑ 8. Operation and maintenance manual provided to building owner

❑ 9. Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft2 in spaces systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.

Exception(s):

- ❑ Systems with heat recovery.
- ❑ Multiple-zone systems without DDC of individual zones communicating with a central control panel.
- ❑ Systems with a design outdoor airflow less than 1200 cfm.
- ❑ Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.

❑ 10. Automatic controls for freeze protection systems present

❑ 11. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted

Exception(s):

- ❑ Hazardous exhaust systems, commercial kitchen and clothes dryer exhaust systems that the International Mechanical Code prohibits the use of energy recovery systems.
- ❑ Systems serving spaces that are heated and not cooled to less than 60°F.
- ❑ Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
- ❑ Heating systems in climates with less than 3600 HDD.
- ❑ Cooling systems in climates with a 1 percent cooling design wet-bulb temperature less than 64°F.
- ❑ Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
- ❑ Laboratory fume hood exhaust systems that have either a variable air volume system capable of reducing exhaust and makeup air volume to 50 percent or less of design values or, a separate make up air supply meeting the following makeup air requirements: a) at least 75 percent of exhaust flow rate, b) heated to no more than 2°F below room setpoint temperature, c) cooled to no lower than 3°F above room setpoint temperature, d) no humidification added, e) no simultaneous heating and cooling.

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2009 IECC requirements in COM*check* Version 4.0.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title	Signature	Date

Section 6: Post Construction Compliance Statement

- ❑ HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner.
- ❑ HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.
- ❑ Written HVAC balancing and operations report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name	Signature	Date

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