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Envelope Compliance Certificate

2009 IECC

Section 1: Project Information

Project Type: **New Construction**

Project Title : Enterprise Rent-a-Car, Portland, Maine Copy 2

Construction Site:

Owner/Agent:

Designer/Contractor:

Section 2: General Information

Building Location (for weather data):

Portland, Maine

Climate Zone:

6a

Building Type for Envelope Requirements:

Non-Residential

Vertical Glazing / Wall Area Pct.:

4%

Activity Type(s)

shop, car wash, office (Automotive Facility)

Floor Area

4176

Section 3: Requirements Checklist

Envelope PASSES: Design 19% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
Roof: Attic Roof, Wood Joists	4176	0.0	56.0	0.017	0.027
Ext. Wall: Concrete Block, 8in., Partially Grouted, Cells Empty, Normal Density, Furring: Metal	1008	0.0	15.0	0.055	0.080
Window: Other (U-Factor option), Clear, SHGC 0.33	54	---	---	0.290	0.350
Door: Insulated Metal, Swinging	21	---	---	0.170	0.700
Ext. Wall: Concrete Block, 8in., Partially Grouted, Cells Empty, Normal Density, Furring: Metal	812	0.0	15.0	0.055	0.080
Door: Insulated Metal, Non-Swinging	100	---	---	0.170	0.500
Door: Insulated Metal, Swinging	63	---	---	0.170	0.700
Window: Other (U-Factor option), Clear, SHGC 0.33	40	---	---	0.290	0.350
Ext. Wall: Concrete Block, 8in., Partially Grouted, Cells Empty, Normal Density, Furring: Metal	1008	0.0	15.0	0.055	0.080
Door: Insulated Metal, Non-Swinging	300	---	---	0.170	0.500
Door: Insulated Metal, Swinging	42	---	---	0.170	0.700
Window: Other (U-Factor option), Clear, SHGC 0.33	16	---	---	0.290	0.350
Ext. Wall: Concrete Block, 8in., Partially Grouted, Cells Empty, Normal Density, Furring: Metal	812	0.0	15.0	0.055	0.080
Door: Insulated Metal, Swinging	100	---	---	0.170	0.700
Door: Insulated Metal, Swinging	63	---	---	0.170	0.700
Window: Other (U-Factor option), Clear, SHGC 0.33	32	---	---	0.290	0.350
Floor: Heated Slab-On-Grade, Vertical 4 ft.	260	---	12.5	---	---

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

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 insulated, and in a manner that 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 equipped with motorized 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 sealed with gasket or caulk.
- ☐ 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.

Section 4: 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 COMcheck-Web and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

Date

Project Notes:

Shop and Car Wash for Enterprise Rent-a-Car



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Interior Lighting Compliance Certificate

2009 IECC

Section 1: Project Information

Project Type: **New Construction**

Project Title : Enterprise Rent-a-Car, Portland, Maine Copy 2

Construction Site:

Owner/Agent:

Designer/Contractor:

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B x C)
shop, car wash, office (Automotive Facility)	4176	0.9	3758
Total Allowed Watts =			3758

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)
shop, car wash, office (ACTIVITY_AUTO_REPAIR, 4176 sq.ft.)				
Type A - 4 ' shop light: 48" T8 32W / Electronic	2	11	64	704
Type B - 8' - washbay: 96" T8 ES 60W / Electronic	2	23	120	2760
Type C - 2x2: 24" T8U 32W / Electronic	2	4	64	256
Total Proposed Watts =				3720

Section 4: Requirements Checklist

Lighting Wattage:

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

Allowed Watts	Proposed Watts	Complies
3758	3720	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.

- ☐ 6. Individual dwelling units separately metered.
- ☐ 7. Medical task lighting or art/history display lighting claimed to be exempt from compliance has a control device independent of the control of the nonexempt lighting.
- ☐ 8. Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps, switching the middle 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.

Interior Lighting PASSES: Design 1% better than code.

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 COMcheck-Web and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

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Exterior Lighting Compliance Certificate

2009 IECC

Section 1: Project Information

Project Type: **New Construction**

Project Title : Enterprise Rent-a-Car, Portland, Maine Copy 2

Exterior Lighting Zone: **2 (Light industrial area with limited nighttime use)**

Construction Site:

Owner/Agent:

Designer/Contractor:

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
Car Rental storage area (Parking area)	67000 ft2	0.06	Yes	4020	2520
building sides (Illuminated length of facade wall or surface)	260 ft	2.5	No	650	469
fueling island (Entry canopy)	1664 ft2	0.25	Yes	416	936
Total Tradable Watts* =				4436	3456
Total Allowed Watts =				5086	
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)
Car Rental storage area (EXTERIOR_PARKING_AREA, 67000 ft2): Tradable Wattage				
HID: Low-Pressure Sodium 18W / Standard	0	8	180	1440
HID: Ceramic Metal Halide 20W / Standard	0	3	360	1080
building sides (EXTERIOR_ILLUMINATED_LENGTH_WALL, 260 ft): Non-tradable Wattage				
HID: Low-Pressure Sodium 18W / Standard	0	7	67	469
fueling island (EXTERIOR_ENTRY_CANOPY, 1664 ft2): Tradable Wattage				
HID: Low-Pressure Sodium 18W / Standard	0	6	156	936
Total Tradable Proposed Watts =				3456

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 period of at least 10 hours.

Exterior Lighting Efficacy:

- ☐ 6. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

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 statute, ordinance, or regulation.
- ☐ Emergency lighting that is automatically off during normal building operation.
- ☐ Lighting that is controlled by motion sensor.

Exterior Lighting PASSES: Design 31% better than code.

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 COMcheck-Web and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

Date



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Mechanical Compliance Certificate

2009 IECC

Section 1: Project Information

Project Type: **New Construction**

Project Title : Enterprise Rent-a-Car, Portland, Maine Copy 2

Construction Site:

Owner/Agent:

Designer/Contractor:

Section 2: General Information

Building Location (for weather data):

Portland, Maine

Climate Zone:

6a

Section 3: Mechanical Systems List

Quantity System Type & Description

- | | |
|---|--|
| 1 | HVAC System (Unknown w/ Perimeter System) :
Heating: 1 each - Unit Heater, Hot Water, Capacity = 168 kBtu/h |
| 1 | Plant: Heating: Hot Water Boiler, Capacity 399 kBtu/h, Gas, Efficiency: 93.00 |
| 1 | Water Heater: Electric Storage Water Heater, Capacity: 120 gallons, Efficiency: 100.00 |

Section 4: Requirements Checklist

Requirements Specific To: HVAC System :

- ☐ 1. Balancing and pressure test connections on all hydronic terminal devices

Requirements Specific To: Plant :

- ☐ 1. Equipment minimum efficiency: Boiler Thermal Efficiency 75% Et 80% Ec
- ☐ 2. Newly purchased heating equipment meets the efficiency requirements
- used equipment must meet 80% Et @ maximum capacity
- ☐ 3. Systems with multiple boilers have automatic controls capable of sequencing boiler operation
- ☐ 4. Hydronic heating systems comprised of a single boiler and >500 kBtu/h input design capacity include either a multistaged or modulating burner

Requirements Specific To: Water Heater :

- ☐ 1. Water heating equipment meets minimum efficiency requirements: Electric Water Heater efficiency: 0.77 EF (403 SL, Btu/h (if > 12 kW))
- ☐ 2. First 8 ft of outlet piping is insulated
- ☐ 3. Hot water storage temperature controls that allow setpoint of 90°F for non-dwelling units and 110°F for dwelling units.
- ☐ 4. Heat traps provided on inlet and outlet of storage tanks

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
- ☐ 2 kW demand or less, submit calculations
- ☐ 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.
- ☐ 8. Operation and maintenance manual provided to building owner
- ☐ 9. Piping, insulated to 1/2 in. if nominal diameter of pipe is < 1.5 in.;
Larger pipe insulated to 1 in. thickness
- ☐ 10. Lavatory faucet outlet temperatures in public restrooms limited to 110°F (43°C)
- ☐ 11. Hot water distribution systems ≥ 300 kBtu/h must have one of the following:
 - a) controls that reset supply water temperature by 25% of supply/return delta T
 - b) mechanical or electrical adjustable-speed pump drive(s)
 - c) two-way valves at all heating coils
 - d) multiple-stage pumps
 - e) other system controls that reduce pump flow by at least 50% based on load- calculations required
- Exception(s):
 - ☐ Where the supply temperature reset controls cannot be implemented without causing improper operation of heating, cooling, humidification, or dehumidification systems.
 - ☐ Hydronic systems that use variable flow to reduce pumping energy.
- ☐ 12. Demand control ventilation (DCV) present for high design occupancy areas (> 40 person/1000 ft² in spaces > 500 ft²) and served by 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.
- ☐ 13. Automatic controls for freeze protection systems present
- ☐ 14. Three-pipe systems not used
- ☐ 15. 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 COMcheck-Web and to comply with the mandatory requirements in the Requirements Checklist.

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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Mechanical Requirements Description

2009 IECC

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: HVAC System :

1. Hydronic heating and cooling coils must be equipped with a way to pressure test connections and measure and balance water flow and pressure.

Requirements Specific To: Plant :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency:
Boiler Thermal Efficiency 75% Et 80% Ec
2. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency. Used equipment must meet 80% Et @ maximum capacity.
3. Systems with multiple boilers have automatic controls capable of sequencing the operation of the boilers.
4. Hydronic heating systems comprised of a single boiler and >500 kBtu/h input design capacity include either a multistaged or modulating burner.

Requirements Specific To: Water Heater :

1. Water heating equipment used solely for heating potable water, pool heaters, and hot water storage tanks must meet the following minimum efficiency: Electric Water Heater efficiency: 0.77 EF (403 SL, Btu/h (if > 12 kW))
2. Insulation must be provided for the first 8 ft of outlet piping for a constant temperature nonrecirculating storage system and for the inlet pipe between the storage tank and a heat trap in a storage system.
3. Service water-heating equipment shall be provided with controls to allow a setpoint of 110°F for equipment serving dwelling units and 90°F for equipment serving non-dwelling units. Lavatory outlet temperatures shall be limited to 110°F.
4. Heat traps must be provided on inlet and outlet vertical pipe risers serving storage water heaters and storage tanks not having integral heat traps and serving a nonrecirculating system.
Heat traps must be installed as close as practical to the storage tank. Acceptable heat traps are either
 - a) a device specifically designed for the purpose or
 - b) an arrangement of tubing that forms a loop of 360°F, or
 - c) piping that from the point of connection to the water heater (inlet or outlet) includes a length of piping directed downwards before connection to the vertical piping of the supply water or hot water distribution system.

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

1. All equipment and systems must be sized to be no greater than needed to meet calculated loads. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
Exception(s):
 - The equipment and/or system capacity may be greater than calculated loads for standby purposes. Standby equipment must be automatically controlled to be off when the primary equipment and/or system is operating.
 - Multiple units of the same equipment type whose combined capacities exceed the calculated load are allowed if they are provided with controls to sequence operation of the units as the load increases or decreases.
2. Each heating or cooling system serving a single zone must have its own temperature control device.
3. Each humidification system must have its own humidity control device.
4. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
5. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria:
 - a) capable of setting back temperature to 55°F during heating and setting up to 85°F during cooling,
 - b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules,
 - c) have an accessible 2-hour occupant override,
 - d) have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.Exception(s):
 - A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
 - A setback or shutoff control is not required on systems with total energy demand of 2 kW (6,826 Btu/h) or less.

6. The system must supply outside ventilation air as required by Chapter 4 of the International Mechanical Code. If the ventilation system is designed to supply outdoor-air quantities exceeding minimum required levels, the system must be capable of reducing outdoor-air flow to the minimum required levels.
7. All pipes serving space-conditioning systems must be insulated as follows:
 - Hot water piping for heating systems:
 - 1 1/2 in. for pipes \leq 1 1/2-in. nominal diameter,
 - 2 in. for pipes $>$ 1 1/2-in. nominal diameter.
 - Chilled water, refrigerant, and brine piping systems:
 - 1 1/2 in. insulation for pipes \leq 1 1/2-in. nominal diameter,
 - 1 1/2 in. insulation for pipes $>$ 1 1/2-in. nominal diameter.
 - Steam piping:
 - 1 1/2 in. insulation for pipes \leq 1 1/2-in. nominal diameter,
 - 3 in. insulation for pipes $>$ 1 1/2-in. nominal diameter.
- Exception(s):
 - Pipe insulation is not required for factory-installed piping within HVAC equipment.
 - Pipe insulation is not required for piping that conveys fluids having a design operating temperature range between 55°F and 105°F.
 - Pipe insulation is not required for piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
 - Piping within room fan-coil (with AHRI440 rating) and unit ventilators (with AHRI840 rating).
 - Pipe insulation is not required for runout piping not exceeding 4 ft in length and 1 in. in diameter between the control valve and HVAC coil.
8. Operation and maintenance documentation must be provided to the owner that includes at least the following information:
 - a) equipment capacity (input and output) and required maintenance actions
 - b) equipment operation and maintenance manuals
 - c) HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions; desired or field-determined set points must be permanently recorded on control drawings, at control devices, or, for digital control systems, in programming comments
 - d) complete narrative of how each system is intended to operate.
9. Service hot water piping, where required, must be insulated to 1/2 in. if pipe less than 1.5 in. nominal diameter. Larger pipe must be insulated to 1 in.. Pipe insulation will have a conductivity of less than 0.28 Btu.in/(h-ft²-°F).
10. Temperature controlling means must be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to 110°F.
11. Hot water space-heating systems with a capacity exceeding 300 kBtu/h supplying heated water to comfort conditioning systems must include controls that automatically reset supply water temperatures by representative building loads (including return water temperature) or by outside air temperature.
 - Exception(s):
 - Where the supply temperature reset controls cannot be implemented without causing improper operation of heating, cooling, humidification, or dehumidification systems.
 - Hydronic systems that use variable flow to reduce pumping energy.
12. Demand control ventilation (DCV) required for high design occupancy areas ($>$ 40 person/1000 ft² in spaces $>$ 500 ft²) and served by 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.
13. All freeze protection systems, including self-regulating heat tracing, must include automatic controls capable of shutting off the systems when outside air temperatures are above 40°F or when the conditions of the protected fluid will prevent freezing. Snow- and ice-melting systems must include automatic controls capable of shutting off the systems when the pavement temperature is above 50°F and no precipitation is falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F.
14. Hydronic systems that use a common return system for both hot water and chilled water must not be used.
15. Individual fan systems with a design supply air capacity of 5000 cfm or greater and minimum outside air supply of 70 percent or greater of the supply air capacity must have an energy recovery system with at least a 50 percent effectiveness. Where cooling with outdoor air is required there is a means to bypass or control the energy recovery system to permit cooling with outdoor air.
 - 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.