WHIPPLE-CALLENDER ARCHITECTS

CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/31/14

December 15, 2014

City of Portland Inspections Office
389 Congress Street
Portland, Maine 04101

RE: 828 Riverside St., Portland Me.

Outlined below is the info for relevant 2009 IECC Mechanical and Electrical requirements:

2009 Section 503 Building Mechanical Systems- Relevant sections;

503.2.1 Calculation of heating and cooling loads- Heating only- Determined per Chapter 3 procedure OR ASHRAE Standard 183. **Total heating load**

503.2.2 Equipment and system sizing- Heating only- Demonstrate equipment sizing does not exceed the loads determined in 503.2.1 above. **Equipment size**

503.2.3 HVAC equipment performance requirements- The efficiency shall be verified through certification under an approved cert. program or supported by manuf. data. Table 503.2.3(5) Gas fired Boiler >300,000 btu/h/ <2,500,000 btu/h (MINIMUM CAPACITY) – 75% thermal efficiency 80% combustion efficiency. **Efficiency per manuf. specifications**

503.2.4.3.1 Thermostatic setback capabilities- Thermostatic controls shall have the capability to set back or temp. operate the system to maintain zone temps down to 55 F or up to 85 F. **Controls provided per code**

503.2.4.3.2 Automatic setback and shutdown capabilities- Automatic time clock or programmable controls shall be capable of starting and stopping the system for seven different daily schedules per week and retaining their programming and time setting during a loss of power for at least 10 hours. Additionally, the controls shall have a manual override that allows temporary operation of the system for up to 2 hours; a manually operated timer capable of being adjusted to operate the system for up to 2 hours; or an occupancy sensor.

503.2.6 Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm (2.36 m^3/s) or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required.

Exception: An energy recovery ventilation system shall not be required in any of the following conditions:
1. Where energy recovery systems are prohibited by the *International Mechanical Code*.
2. Laboratory fume hood systems that include at least one of the following features:
2.1. Variable-air-volume hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50 percent or less of design values.
2.2. Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room setpoint, cooled to no cooler than 3°F (1.7°C) above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.

P.O. BOX 1726 , PORTLAND, MAINE 04101 PH: 207-775-2696 FAX: 207-775-3631 joe@whipplecallender.com

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/31/14

3. Systems serving spaces that are not cooled and are heated to less than 60°F (15.5°C). Th space shall not have an ERV as its temp will be set t 60 F. The office area will be equipped with an ERV.

4. Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
5. Heating systems in climates with less than 3,600 HDD.
6. Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64°F (18°C).
7. Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil.

503.2.8 Piping Insulation- All piping serving as part of a heating or cooling system shall be thermally insulated per Table 503.2.8. **Per Table 503.2.8, we will provide HW pipe insul. of 1.5" at piping smaller than 1.2" and 2" for piping greater than 1.5"**

503.2.9.3 Manuals. The construction documents shall require that an operating and maintenance manual be provided to the building owner by the mechanical contractor. The manual shall include, at least, the following: **WILL BE PROVIDED**
1. Equipment capacity (input and output) and required maintenance actions.
2. Equipment operation and maintenance manuals.
3. HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings, at control devices or, for digital control systems, in programming comments.
4. A complete written narrative of how each system is intended to operate.

2009 Section 505 Electrical Power and Lighting Systems- Relevant sections;

505.2.1 Interior Lighting Controls- Each area enclosed by walls or floor-to-ceiling partitions shall have at least one manual control for the lighting serving that area. The required controls shall be located within the area served by the controls or be a remote switch that identifies the lights served and indicates their status.

505.2.2.1 Light reduction controls. Each area that is required to have a manual control shall also allow the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent. Lighting reduction shall be achieved by one of the following or other *approved* method:
1. Controlling all lamps or luminaires;
2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps;
3. Switching the middle lamp luminaires independently of the outer lamps; or
4. Switching each luminaire or each lamp.

Exceptions:
1. Areas that have only one luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, storerooms, restrooms or public lobbies.
4. *Sleeping unit* (see Section 505.2.3).
5. Spaces that use less than 0.6 watts per square foot (6.5 W/m^2).

505.2.2.2 Automatic lighting shutoff. Buildings larger than 5,000 square feet (**SPACE LESS THAN 5,000 S.F.)** (465 m^2) shall be equipped with an automatic control device to shut off lighting in those areas. This automatic control device shall function on either:
1. A scheduled basis, using time-of-day, with an independent program schedule that controls the

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/31/14

interior lighting in areas that do not exceed 25,000 square feet (2323 m^2) and are not more one floor; or
2. An occupant sensor that shall turn lighting off within 30 minutes of an occupant leaving a space; or
3. A signal from another control or alarm system that indicates the area is unoccupied.

Exception: The following shall not require an automatic control device:
1. *Sleeping unit* (see Section 505.2.3).
2. Lighting in spaces where patient care is directly provided.
3. Spaces where an automatic shutoff would endanger occupant safety or security.

505.4 Exit signs (Mandatory). Internally illuminated exit signs shall not exceed 5 watts per side.

505.5 Interior lighting power requirements (Prescriptive). A building complies with this section if its total connected lighting power calculated under Section 505.5.1 is no greater than the interior lighting power calculated under Section 505.5.2.

505.5.1 Total connected interior lighting power. The total connected interior lighting power (watts) shall be the sum of the watts of all interior lighting equipment as determined in accordance with Sections 505.5.1.1 through 505.5.1.4.

Exceptions:
1. The connected power associated with the following lighting equipment is not included in calculating total connected lighting power.
1.1. Professional sports arena playing field lighting.
1.2. *Sleeping unit* lighting in hotels, motels, boarding houses or similar buildings.
1.3. Emergency lighting automatically off during normal building operation.
1.4. Lighting in spaces specifically designed for use by occupants with special lighting needs including the visually impaired visual impairment and other medical and age-related issues.
1.5. Lighting in interior spaces that have been specifically designated as a registered interior historic landmark.
1.6. Casino gaming areas.
2. Lighting equipment used for the following shall be exempt provided that it is in addition to general lighting and is controlled by an independent control device:
2.1. Task lighting for medical and dental purposes.
2.2. Display lighting for exhibits in galleries, museums and monuments.
3. Lighting for theatrical purposes, including performance, stage, film production and video production.
4. Lighting for photographic processes.
5. Lighting integral to equipment or instrumentation and is installed by the manufacturer.
6. Task lighting for plant growth or maintenance.
7. Advertising signage or directional signage.
8. In restaurant buildings and areas, lighting for food warming or integral to food preparation equipment.
9. Lighting equipment that is for sale.
10. Lighting demonstration equipment in lighting education facilities.
11. Lighting *approved* because of safety or emergency considerations, inclusive of exit lights.
12. Lighting integral to both open and glass-enclosed refrigerator and freezer cases.
13. Lighting in retail display windows, provided the display area is enclosed by ceiling-height partitions.
14. Furniture mounted supplemental task lighting that is controlled by automatic shutoff.
505.5.1.1 Screw lamp holders. The wattage shall be the maximum *labeled* wattage of the luminaire.
505.5.1.2 Low-voltage lighting. The wattage shall be the specified wattage of the transformer supplying the system.
505.5.1.3 Other luminaires. The wattage of all other lighting equipment shall be the wattage of the lighting equipment verified through data furnished by the manufacturer or other *approved* sources.

CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/31/14

505.5.1.4 Line-voltage lighting track and plug-in busway. The wattage shall be:
1. The specified wattage of the luminaires included in the system with a minimum of 30 W/lin ft. (98 W/lin. m);
2. The wattage limit of the system's circuit breaker; or
3. The wattage limit of other permanent current limiting device(s) on the system.

505.5.2 Interior lighting power. The total interior lighting power (watts) is the sum of all interior lighting powers for all areas in the building covered in this permit. The interior lighting power is the floor area for each building area type listed in Table 505.5.2 times the value from Table 505.5.2 for that area. For the purposes of this method, an "area" shall be defined as all contiguous spaces that accommodate or are associated with a single building area type as *listed* in Table 505.5.2. When this method is used to calculate the total interior lighting power for an entire building, each building area type shall be treated as a separate area.

TABLE 505.5.2 INTERIOR LIGHTING POWER ALLOWANCES

LIGHTING POWER DENSITY	
Building Area Type[a]	(W/ft^2)
Automotive Facility	0.9
Convention Center	1.2
Court House	1.2
Dining: Bar Lounge/Leisure	1.3
Dining: Cafeteria/Fast Food	1.4
Dining: Family	1.6
Dormitory	1.0
Exercise Center	1.0
Gymnasium	1.1
Healthcare-clinic	1.0
Hospital	1.2
Hotel	1.0
Library	1.3
Manufacturing Facility	**1.3**
Motel	1.0
Motion Picture Theater	1.2
Multifamily	0.7
Museum	1.1
Office	1.0
Parking Garage	0.3

(continued)

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/31/14

TABLE 505.5.2-continued INTERIOR LIGHTING POWER ALLOWANCES

LIGHTING POWER DENSITY	
Building Area Type[a]	(W/ft²)
Penitentiary	1.0
Performing Arts Theater	1.6
Police/Fire Station	1.0
Post Office	1.1
Religious Building	1.3
Retail[b]	1.5
School/University	1.2
Sports Arena	1.1
Town Hall	1.1
Transportation	1.0
Warehouse	**0.8**
Workshop	1.4

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m2.

a. In cases where both a general building area type and a more specific building area type are listed, the more specific building area type shall apply.

505.6.1 Exterior building grounds lighting. NO GROUND LIGHTING INCLUDED All exterior building grounds luminaires that operate at greater than 100 watts shall contain lamps having a minimum efficacy of 60 lumens per watt unless the luminaire is controlled by a motion sensor or qualifies for one of the exceptions under
Section 505.6.2.

505.6.2 Exterior building lighting power. The total exterior lighting power allowance for all exterior building applications is the sum of the base site allowance plus the individual allowances for areas that are to be illuminated and are permitted in Table 505.6.2(2) for the applicable lighting *zone*. Tradeoffs are allowed only among exterior lighting applications listed in Table 505.6.2(2), Tradable Surfaces section. The lighting zone for the building exterior is determined from Table 505.6.2(1) unless otherwise specified by the local jurisdiction. Exterior lighting for all applications (except those included in the exceptions to Section 505.6.2) shall comply with the requirements of Section 505.6.1.

Exceptions: Lighting used for the following exterior applications is exempt when equipped with a control device independent of the control of the nonexempt lighting:
1. Specialized signal, directional and marker lighting associated with transportation;
2. Advertising signage or directional signage;
3. Integral to equipment or instrumentation and is installed by its manufacturer;
4. Theatrical purposes, including performance, stage, film production and video production;
5. Athletic playing areas;
6. Temporary lighting;
7. Industrial production, material handling, transportation sites and associated storage areas;
8. Theme elements in theme/amusement parks; and
9. Used to highlight features of public monuments and registered historic landmark structures or buildings.

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 12/31/14

TABLE 505.6.2(1) EXTERIOR LIGHTING ZONES

LIGHTING ZONE	DESCRIPTION
1	Developed areas of national parks, state parks, forest land, and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas
3	All other areas
4	High-activity commercial districts in major metropolitan areas as designated by the local land use planning authority

505.7 Electrical energy consumption. (Mandatory). **N.A.**