Paul, Patricia@Energy

From: Strait, Peter@Energy
Sent: Wednesday, June 03, 2015 9:45 AM
To: Energy - Docket Optical System
Cc: Geiszler, Eurlyne@Energy
Subject: FW: 2016 Language Changes from Petition
Attachments: Pages from 2016 T24 responding to Item 9.pdf; Pages from 2016 T24 responding to Item 10.pdf; Pages from 2016 T24 responding to Item 11.pdf; Pages from 2016 T24 responding to Item 12.pdf; Pages from 2016 T24 responding to Item 13.pdf; Pages from 2016 T24 responding to Item 19.pdf; Pages from 2016 T24 responding to Item 5.pdf

Categories: Ready to Docket

Hello Dockets,

Please docket the below letter to Pat Splitt, along with attachments, to both 15-MISC-01 and 15-MISC-02.

Thank you,

Peter

From: Strait, Peter@Energy
Sent: Monday, June 01, 2015 3:53 PM
To: 'info@app-techinc.com'
Subject: 2016 Language Changes from Petition

Dear Mr. Splitt,

With the publication of the 15-Day Language, I wanted to reach out to you to highlight the changes we'd made to be responsive to the items you identified in your Emergency Rulemaking petition.

I've attached page excerpts containing the changes made to the 2016 Standards that address items in your petition, numbered according to the item each is responsive to (using the numbering in our staff response). The changes are as follows:

- Item 5: Section 150.2(b)(2)(B) - A note has been added to this Section to make explicit the ability to trade between two components of the same type, and the language has additionally been edited to align with the change made to address Item 10.
- Item 9: Section 141.0(b)2I - The language for nonresidential lighting alterations has been rewritten, and the rewritten language is clearer in regards to what activities trigger the requirements of this Section. There is also a path that allows a whole-project compliance approach.
- Item 10: Section 141.0(b)3B - The language of this Section has been edited to clearly state that the third party verification option means verifying the components for which additional credit is taken under that option. The same phrase has been added to Section 150.2(b)2B.

- Item 11: Table 141.0-E - This table has been rewritten as a part of rewriting Section 141.0(b)2I, and now provides more streamlined information regarding applicable lighting control requirements. This addresses the original concern that the table should only discuss control requirements and not lighting power densities.

- Item 12: Section 150.0(j)1A - This Section, regarding installation of a less-than-federally-compliant water heater, has been removed from the Standards.

- Item 13: Section 150.0(j)2 - The language in this Section has been edited to remove the specification of a psig for hot water systems. (The language of this Section has also been edited to remove a specification that buried pipes include a casing or sleeve "that allows for installation, removal, and replacement of the enclosed pipe and insulation". I believe you requested that we look into removing this language at the April townhall meeting; the language was found to be unneeded as common practice is to replace the casing and insulation as well if the pipe is replaced.)

- Item 19: Section 130.2(b) - A note was added to this section to provide direction to the Title 24, Part 11, Section 5.106.8 requirements.

We've added highlighting comments to the PDFs to both show and explain the changes (hover or double-click on the highlighting if the comment text is not immediately visible). We've also internally drafted changes to the Compliance Manuals that address other items in your petition; I'll be drafting a separate letter with those changes shortly.

Please let me know if there's any additional information my team can provide.

Thank you,

Peter Strait

Supervisor, Building Standards Office
California Energy Commission
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~~d. The LED modules are certified as high efficacy to the Commission in accordance with Section 110.9; and~~

~~e. The LED modules are not connected using screw-based sockets or screw-base adaptors.~~

2. **Performance approach.** This performance approach shall only be used for projects that include tradeoffs between two or more altered components that are listed in TABLE 150.2-~~B~~C.

NOTE: The altered components may be components of the same type, such as a tradeoff between two windows, or components of differing types, such as a tradeoff between a window and an amount of attic insulation.

A. The altered components shall meet the applicable requirements of Sections 110.0 through 110.9 and Section 150.0(a) through (q); and

B. The standard design for an altered component shall be the higher efficiency of existing conditions or the requirements stated in TABLE 150.2-~~B~~C. For components not being altered, the standard design shall be based on the existing conditions. When the third party verification option is specified as a requirement, all components proposed for alteration for which the additional credit is taken, must be verified.

TABLE 150.2-~~A~~ B AGED SOLAR REFLECTANCE INSULATION TRADE OFF TABLE

Aged Solar Reflectance	Roof Deck Insulation R-value	Aged Solar Reflectance	Roof Deck Insulation R-value
0.62-0.60	2	0.44-0.40	12
0.59-0.55	4	0.39-0.35	16
0.54-0.50	6	0.34-0.30	20
0.49-0.45	8	0.29-0.25	24

EXCEPTION 2 to Section 141.0(b)2J. One for one replacement of luminaire components where the modified luminaires have at least 15 percent the same or lower power consumption compared to the original luminaires.

EXCEPTION 3 to Section 141.0(b)2J. Modifications that would directly cause the disturbance of asbestos, unless the modifications are made in conjunction with asbestos abatement.

K. For each enclosed space, the following wiring alterations serving permanently installed lighting shall not cause the lighting power allowance in Section 140.6 to be exceeded and shall meet the applicable requirements in Section 130.1(a) and (c):

i. Adding a circuit feeding luminaires;

ii. Modifying or relocating wiring to provide power to new or relocated luminaires;

iii. Replacing, modifying, or relocating wiring between a switch or panelboard and luminaires; or

iiiv. Replacing lighting control panels, panelboards, or branch circuit wiring.

EXCEPTION 1 to Section 141.0(b)2J. Modifications strictly limited to the addition of lighting controls.

EXCEPTION 2 to Section 141.0(b)2KJ. Alterations that would directly cause the disturbance of asbestos, unless the alterations are made in conjunction with asbestos abatement.

JKL. Alterations to existing outdoor lighting systems shall meet the following requirements:

i. Alterations that increase the connected lighting load in a lighting application listed in TABLE 140.7-A or 140.7-B shall meet the applicable requirements of Sections 130.0, 130.2, 130.4, and 140.7; and

ii. In alterations that replace 10 percent or more of the luminaires in a lighting application listed in TABLE 140.7-A or 140.7-B, the altered luminaires shall meet the applicable requirements of Sections 130.0, 130.2 and 130.4; and

iii. In alterations that replace more than 50 percent of the luminaires in a lighting application listed in TABLE 140.7-A or 140.7-B, the lighting in that application shall meet the applicable requirements of Sections 130.0, 130.2, 130.4 and 140.7.

I. **Entire Luminaire Alterations.** Entire luminaire alterations shall meet the following requirements:

i. For each enclosed space, alterations that consist of either (a) removing and reinstalling a total of 10 percent or more of the existing luminaires; or (b) replacing or adding entire luminaires; or (c) adding, removing, or replacing walls or ceilings along with any redesign of the lighting system, shall meet the lighting power allowance in Section 140.6, and the altered luminaires shall meet the applicable requirements in TABLE 141.0-E; or

ii. For alterations where existing luminaires are replaced with new luminaires, and that do not include adding, removing, or replacing walls or ceilings along with redesign of the lighting system, all the replacement luminaires shall collectively have at least 30 percent lower rated power at full light output as compared to the existing luminaires being replaced; and in spaces other than corridors and stairwells, or spaces operating 24 hours per day, 365 days per year, shall be equipped with automatic shut-off controls complying with Sections 130.1(c)1A through C, 130.1(c)2, 130.1(c)3, 130.1(c)4, 130.1(c)5, 130.1(c)6A, and for parking garages 130.1(c)7B.

EXCEPTION 1 to Section 141.0(b)2I. Alteration of portable luminaires, luminaires affixed to moveable partitions, or lighting excluded as specified in Section 140.6(a)3.

EXCEPTION 2 to Section 141.0(b)2I. In an enclosed space where two or fewer luminaires are replaced or reinstalled.

EXCEPTION 3 to Section 141.0(b)2I. Alterations that would directly cause the disturbance of asbestos, unless the alterations are made in conjunction with asbestos abatement.

EXCEPTION 4 to Section 141.0(b)2I. Acceptance testing requirements of Section 130.4 are not required for alterations where lighting controls are added to control 20 or fewer luminaires.

J. **Luminaire Component Modifications.** Luminaire component modifications in place that include replacing the ballasts or drivers and the associated lamps in the luminaire, or permanently changing the light source of the luminaire, or changing the optical system of the luminaire, where 70 or more existing luminaires are modified on any single floor of a building, shall meet the applicable requirements of Sections 130.1(a)1, 2, and 3, 130.1(c)1A through C, 130.1(c)2, 130.1(c)3, 130.1(c)4, 130.1(c)5, 130.1(c)6A, and for parking garages 130.1(c)7B, shall not prevent or disable the operation of any multi-level, shut-off, or daylighting controls, and shall either:

i. Meet the lighting power allowance in Section 140.6; or

ii. Collectively have at least 30 percent lower rated power at full light output as compared to the original luminaires prior to being modified.

Lamp replacements alone and ballast replacements alone shall not be considered a modification of the luminaire provided that the replacement lamps or ballasts are installed and powered without modifying the luminaire.

EXCEPTION 1 to Section 141.0(b)2J. Modification of portable luminaires, luminaires affixed to moveable partitions, or lighting excluded by Section 140.6(a)3.

EXCEPTION 2 to Section 141.0(b)2J. In an enclosed space where two or fewer luminaires are modified.

EXCEPTION 3 to Section 141.0(b)2J. Modifications that would directly cause the disturbance of asbestos, unless the modifications are made in conjunction with asbestos abatement.

EXCEPTION 4 to Section 141.0(b)2J. Acceptance testing requirements of Section 130.4 are not required for modifications where lighting controls are added to control 20 or fewer luminaires.

K. **Lighting Wiring Alterations.** For each enclosed space, wiring alterations that add a circuit feeding luminaires; that replace, modify, or relocate wiring between a switch or panelboard and luminaires; or that replace lighting control panels, panelboards, or branch circuit wiring; shall:

i. meet the lighting power allowance in Section 140.6;

ii. meet the requirements in Sections 130.1(a)1, 2, and 3, 130.1(c)1A through C, 130.1(c)3, and 130.1(c)4;

iii. for each enclosed space, be wired to create a minimum of one step between 30-70 percent of lighting power; and

iv. for each enclosed space where wiring alterations include 25 or more luminaires that are located within the primary sidelit daylit zone and the skylit daylit zone, meet the requirements of 130.1(d).

NOTE: As specified in Section **141.0(b)2I,** alterations that include adding, removing, or replacing walls or ceilings resulting in redesign of the lighting system shall meet the requirements of Table 141.0-E.

EXCEPTION 1 to Section 141.0(b)2K. Alterations strictly limited to addition of lighting controls.

EXCEPTION 2 to Section 141.0(b)2K. In an enclosed space where wiring alterations involve two or fewer luminaires.

EXCEPTION 3 to Section 141.0(b)2K. Alterations that would directly cause the disturbance of asbestos, unless the alterations are made in conjunction with asbestos abatement.

EXCEPTION 4 to Section 141.0(b)2K. Acceptance testing requirements of Section 130.4 are not required for wiring alterations where lighting controls are added to control 20 or fewer luminaires.

L. Alterations to existing outdoor lighting systems in a lighting application listed in TABLE 140.7-A or 140.7-B shall meet the applicable requirements of Sections 130.0, 130.2(a), 130.2(b), and 130.4, and:

i. In alterations that increase the connected lighting load, the added or altered luminaires shall meet the applicable requirements of Section 130.2(c) and the requirements of Section 140.7 for general hardscape lighting or for the specific lighting applications containing the alterations; and

ii. In alterations that do not increase the connected lighting load, where the greater of 5 luminaires or 10 percent of the existing luminaires are replaced in a general hardscape or a specific lighting application, the alterations shall meet the following requirements:

a. In parking lots and outdoor sales lots where the bottom of the luminaire is mounted 24 feet or less above the ground, the replacement luminaires shall comply with Section 130.2(c)1 AND Section 130.2(c)3;

b. For all other lighting applications and where the bottom of the luminaire is mounted greater than 24 feet above the ground, the replacement luminaires shall comply with Section 130.2(c)1 AND EITHER comply with Section 130.2(c)2 or be controlled by lighting control systems, including motion sensors, that automatically reduces lighting power by at least 40 percent in response to the area being vacated of occupants; and

iii. In alterations that do not increase the connected lighting load, where the greater of 5 luminaires or 50 percent of the existing luminaires are replaced in general hardscape or a specific application, the replacement luminaires shall meet the requirements of subsection ii above and the requirements of Section 140.7 for general hardscape lighting or specific lighting applications containing the alterations.

EXCEPTION to Section 141.0(b)2Liii. Alterations where the replacement luminaires have at least 40 percent lower power consumption compared to the original luminaires are not required to comply with the lighting power allowances of Section 140.7.

EXCEPTION to Section 141.0(b)2L. Acceptance testing requirements of Section 130.4 are not required for alterations where controls are added to 20 or fewer luminaires.

~~K~~M. Alterations to existing internally and externally illuminated signs that increase the connected lighting load, replace and rewire more than 50 percent of the ballasts, or relocate the sign to a different location on the same site or on a different site shall meet the requirements of Section 140.8

~~L.~~ **EXCEPTION to Section 141.0(b)2M~~L~~.** Replacement of parts of an existing sign, including replacing lamps, the sign face or ballasts, that do not require rewiring or that are done at a time other than when the sign is relocated, is not an alteration subject to the requirements of Section 141.0(b)2~~KL~~M.

~~M~~N. Service water-heating systems shall meet the requirements of Section 140.5, except for the solar water heating requirements.

~~N~~O. A building shall for which interior walls or ceilings are installed for the first time shall meet the requirements of Section 140.3(c).

P. **Electrical Power Distribution Systems.** Alterations to electrical power distribution systems shall meet the applicable requirements of Section 130.5 as follows:~~.~~

i. Service Electrical Metering.

New or replacement electrical service equipment shall meet the requirements of Section 130.5(a) applicable to the electrical power distribution system altered.

ii. Separation Of Electrical Circuits For Electrical Energy Monitoring.

For entirely new or complete replacement of electrical power distribution systems, the entire system shall meet the applicable requirements of Section 130.5(b).

iii. Voltage Drop. Alterations of feeders and branch circuits where the alteration includes addition, modification, or replacement of both feeders and branch circuits, the altered circuits shall meet the requirements of Section 130.5(c).

EXCEPTION to Section 141.0(b)2Piii: Voltage drop permitted by California Electrical Code Sections 647.4, 695.6 and 695.7.

iv. Circuit Controls for 120-Volt Receptacles and Controlled Receptacles.
For entirely new or complete replacement of electrical power distribution systems, the entire system shall meet the applicable requirements of Section 130.5(d).

~~When adding, relocating, or replacing service, switchboards, distribution panelboards, motor control centers, panelboards, distribution equipment, circuits, or receptacles, the altered component of the electrical power distribution system shall meet the requirements of Section 130.5.~~

~~**EXCEPTION 1 to Section 141.0(b)2OP:** Conductors for non-motor branch circuits shall be sized to prevent a voltage drop exceeding 3 percent at the farthest connected load or outlet.~~

~~**EXCEPTION 2 to Section 141.0(b)2OP:** When the installation is for motors only, the conductors for motor branch circuits shall be sized to prevent a voltage drop exceeding 6 percent at the farthest connected load or outlet.~~

~~**EXCEPTION 3 to Section 141.0(b)2OP:** Addition of 120 volt receptacle(s) to an existing circuit containing 10 or more receptacles.~~

~~**EXCEPTION 4 to Section 141.0(b)2OP:** Replacement of 120 volt receptacles in an existing circuit.~~

~~**EXCEPTION 5 to Section 141.0(b)2OP:** Addition of one 120 volt receptacle to an existing circuit in an office space.~~

~~Q. **Demand Responsive Controls and Equipment.** Alterations where the altered space is larger than 10,000 square feet shall meet the demand responsive control requirements of Section 130.1(e) and 130.5(e).~~

3. Performance approach.

A. The altered envelope, space–conditioning system, lighting and water heating components, and any newly installed equipment serving the alteration, shall meet the applicable requirements of Sections 110.0 through 110.9, Sections 120.0 through 120.6, and Sections 120.~~8~~9 through 130.5.

EXCEPTION to Section 141.0(b)3A Window Films. Applied window films installed as part of an alteration complies with the U-factor, RSHGC and VT requirements of TABLE 141.0-D.

B. The standard design for an altered component shall be the higher efficiency of existing conditions or the requirements stated in TABLE 141.0-D. For components not being altered, the standard design shall be based on the existing conditions. When the third party verification option is specified, all components proposed for alteration, for which the additional credit is taken, must be verified. The Executive Director shall determine the qualifications required by the third party inspector.

TABLE 141.0-E Control Requirements for ~~Lighting System~~Entire Luminaire Alterations

~~Mandatory c~~Control requirements that shall be met when 10% or more of existing luminaires in an enclosed space are altered	**Resulting lighting power, compared to the lighting power allowance specified in Section 140.6(c)2. Area Category Method**	
	Lighting power is ≤ 85% of allowance	**Lighting power is > 85% to 100% of allowance**
Section 130.1(a)1, 2, and 3 Area Controls	Yes	Yes
Section 130.1(b) Multi-Level Lighting Controls – only for alterations to general lighting of enclosed spaces 100 square feet or larger with a connected lighting load that exceeds 0.5 watts per square foot	For each ~~luminaire~~enclosed space, minimum one step between 30-70 percent of lighting power regardless of luminaire type, or meet Section 130.1(b)	Yes
Section 130.1(c) Shut-Off Controls	Yes	Yes
Section 130.1(d) Automatic Daylight Controls	Not Required	Yes
Section 130.1(e) Demand Responsive Controls – only for alterations > 10,000 ft^2 in a single building, where the alteration also changes the area of the space, or changes the occupancy type of the space, or increases the lighting power	Not Required	Yes

~~*TABLE 141.0-E Requirements for Luminaire Alterations*~~

~~**Quantity of existing affected luminaires per Enclosed Space [1]**~~	~~**Resulting Lighting Power for Each Enclosed Space**~~	~~**Applicable Mandatory Control Provisions for Each Enclosed Space**~~	~~**Multi-level Lighting Control Requirements for Each Altered Luminaire**~~
~~**Alterations that do not change the area of the enclosed space or the space type**~~			
~~Sum total < 10% of existing luminaires~~	~~Existing lighting power is permitted~~	~~Existing provisions are permitted~~	~~Existing controls are permitted~~
~~Sum total ≥ 10% of existing luminaires~~	~~≤ 85% of allowed lighting power per Section 140.6 Area Category Method~~	~~§130.1(a), (c)~~	~~Two level lighting control [2] or §130.1(b)~~
	~~> 85% of allowed lighting power per Section 140.6 Area Category Method~~	~~§130.1(a), (c), (d) [3]~~	~~§130.1(b)~~
~~**Alterations that change the area of the enclosed space or the space type or increase the lighting power in the enclosed space**~~			
~~Any number~~	~~Comply with Section 140.6~~	~~§130.0(d) [3] §130.1(a), (c), (d) [3], (e)~~	~~§130.1(b)~~

~~1. Affected luminaires include any luminaire that is changed, replaced, removed, relocated; or, connected to, altered or revised wiring, except as permitted by EXCEPTIONS 1 and 2 to Section 141.0(b)~~**2Iii:**

~~2. Two level lighting control shall have at least one control step between 30 percent and 70 percent of design lighting power in a manner providing reasonably uniform illuminations~~

~~3. Daylight controls in accordance with Section 130.0(d) are required only for luminaires that are altered.~~

~~*TABLE 141.0-F Requirements for Luminaire Modifications-in-Place*~~

~~For compliance with this Table, building space is defined as any of the following:~~

~~1. A complete single story building~~

~~2. A complete floor of a multifloor building~~

~~3. The entire space in a building of a single tenant under a single lease~~

~~4. All of the common, not leasable space in single building~~

4. Insulation for a heated slab floor shall meet the requirements of Section 110.8(g).

~~RESERVED~~

(g) **Vapor Retarder**

1. In Climate Zones 1-16, the earth floor of unvented crawl space shall be covered with a Class I or Class II vapor retarder. This requirement shall also apply to controlled ventilation crawl space for buildings complying with the Exception to Section 150.0(d).

2. In Climate Zones 14 and 16, a Class I or Class II vapor retarder shall be installed on the conditioned space side of all insulation in all exterior walls, vented attics and unvented attics with air-permeable insulation, ~~; and~~

~~2A. In Climate Zones 1-16 with unvented crawl spaces the earth floor of the crawl space shall be covered with a Class I or Class II vapor retarder; or~~

~~3B. In a building having a controlled ventilation crawl space, a Class I or Class II vapor retarder shall be placed over the earth floor of the crawl space to reduce moisture entry and protect insulation from condensation, as specified in the exception to Section 150.0(d).~~

(h) **Space-Conditioning Equipment.**

1. **Building Cooling and Heating Loads.** Building heating and cooling loads shall be determined using a method based on any one of the following:

   A. The ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; or

   B. The SMACNA Residential Comfort System Installation Standards Manual; or

   C. The ACCA Manual J.

   The cooling and heating loads are two of the criteria that shall be used for equipment sizing and selection.

   NOTE: Heating systems are required to have a minimum heating capacity adequate to meet the minimum requirements of the CBC. The furnace output capacity and other specifications are published in the Commission's directory of certified equipment or other directories approved by the Commission.

2. **Design conditions**. For the purpose of sizing the space-conditioning (HVAC) system, the indoor design temperatures shall be 68°F for heating and 75°F for cooling. Outdoor design conditions shall be selected from Reference Joint Appendix JA2, which is based on data from the ASHRAE Climatic Data for Region X. The outdoor design temperatures for heating shall be no lower than the Heating Winter Median of Extremes values. The outdoor design temperatures for cooling shall be no greater than the 1.0 percent Cooling Dry Bulb and Mean Coincident Wet Bulb values.

3. **Outdoor Condensing Units.**

   A. **Clearances.** Installed air conditioner and heat pump outdoor condensing units shall have a clearance of at least five (5) feet (1.5 meters) from the outlet of any dryer vent.

   B. **Liquid Line Drier.** Installed air conditioner and heat pump systems shall be equipped with liquid line filter driers if required, as specified by manufacturer's instructions.

4. **Central Forced-Air Heating Furnaces**.

   A. **Temperature Rise**. Central forced-air heating furnace installations shall be configured to operate in conformance with the furnace manufacturer's maximum inlet-to-outlet temperature rise specifications.

(i) **Thermostats**. All unitary heating or cooling systems, including heat pumps, not controlled by a central energy management control system (EMCS) shall have a setback thermostat, as specified in ~~Heating systems shall be equipped with thermostats that meet the requirements of~~ Section 110.2(c).

(j) **Water System Piping and Insulation for Piping, Tanks, and Cooling System Lines.**

1. **Storage tank insulation.**

~~A. Storage gas water heaters with an energy factor equal to or less than the federal minimum standards shall be externally wrapped with insulation having an installed thermal resistance of R-12 or greater.~~

~~A~~B. Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, shall be externally wrapped with insulation having an installed thermal resistance of R-12 or greater or have internal insulation of at least R-16 and a label on the exterior of the tank showing the insulation R-value.

2. **Water piping and cooling system line insulation thickness and conductivity.** Piping shall be insulated to the thicknesses as follows:

   A. All domestic hot water system piping conditions listed below, whether buried or unburied, must be insulated and the insulation thickness shall be selected based on the conductivity range in TABLE 120.3-A and the insulation level shall be selected from the fluid temperature range based on the thickness requirements in TABLE 120.3-A:

      i. The first 5 feet (1.5 meters) of hot and cold water pipes from the storage tank.

      ii. All piping with a nominal diameter of 3/4 inch (19 millimeter) or larger.

      iii. All piping associated with a domestic hot water recirculation system regardless of the pipe diameter.

      iv. Piping from the heating source to storage tank or between tanks.

      v. Piping buried below grade.~~.~~

      vi. All hot water pipes from the heating source to the kitchen fixtures.

   B. In addition to insulation requirements, all domestic hot water pipes that are buried below grade must be installed in a water proof and non-crushable casing or sleeve ~~that allows for installation, removal, and replacement of the enclosed pipe and insulation~~.

   C. Pipe for cooling system lines shall be insulated as specified in Subsection A. ~~Piping~~Distribution piping for steam and hydronic heating systems, ~~or hot water systems with pressure above 15 psig (103 kPa)~~ shall meet the requirements in TABLE 120.3-A.

   EXCEPTION 1 to Section 150.0(j)2: Factory-installed piping within space-conditioning equipment certified under Section 110.1 or 110.2.

   EXCEPTION 2 to Section 150.0(j)2: Piping that serves process loads, gas piping, cold domestic water piping, condensate drains, roof drains, vents, or waste piping.

   EXCEPTION 3 to Section 150.0(j)2: Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Metal piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members.

   EXCEPTION 4 to Section 150.0(j)2: Piping installed in interior or exterior walls shall not be required to have pipe insulation if all of the requirements are met for compliance with Quality Insulation Installation (QII) as specified in the Reference Residential Appendix RA3.5.

   EXCEPTION 5 to Section 150.0(j)2: Piping installed in attics with a minimum of 4 inches (10 cm) of attic insulation on top of the piping shall not be required to have pipe insulation.

   NOTE: Where the Executive Director approves a water heater calculation method for particular water heating recirculation systems, piping insulation requirements are those specified in the approved calculation method.

3. **Insulation Protection.** Insulation outside conditioned space shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Protection includes but is not limited to the following:

   A. Insulation exposed to weather shall ~~either be rated for outdoor use or~~be installed with a cover suitable for outdoor service~~; e.g.~~, including but not limited to ~~protected by~~ aluminum, sheet metal, painted canvas, or plastic cover. ~~Cellular foam insulation shall be protected as above or painted with a coating that is~~The cover shall be water retardant and provides shielding from solar radiation that can cause degradation of the material.

SECTION 130.2 – OUTDOOR LIGHTING CONTROLS AND EQUIPMENT

Nonresidential, high-rise residential and hotel/motel buildings shall comply with the applicable requirements of Sections 130.2(a) through 130.2(c).

(a) **Outdoor Incandescent Lighting.** All outdoor incandescent luminaires rated over 100 watts, determined in accordance with Section 130.0(c)2, shall be controlled by a motion sensor.

(b) **Luminaire Cutoff Requirements.** All outdoor luminaires rated for use with lamps greater than 150 lamp watts, determined in accordance with Section 130.0(c), shall comply with Backlight, Uplight, and Glare (collectively referred to as "BUG" in accordance with IES TM-15-11, Addendum A) requirements as follows:

1. There are no Backlight requirements in Section 130.2 of Part 6; and
2. Maximum zonal lumens for Uplight shall be in accordance with TABLE 130.2-A; and
3. Maximum zonal lumens for Glare shall be in accordance with TABLE 130.2-B.

NOTE: ~~Note that~~ Title 24, Part 11, Section 5.106.8 includes additional restrictions on backlight, uplight and glare that may apply.

EXCEPTION 1 to Section 130.2(b): Signs.

EXCEPTION 2 to Section 130.2(b): Lighting for building facades, public monuments, statues, and vertical surfaces of bridges.

EXCEPTION 3 to Section 130.2(b): Lighting not permitted by a health or life safety statute, ordinance, or regulation to be a cutoff luminaire.

EXCEPTION 4 to Section 130.2(b): Temporary outdoor lighting**.**

EXCEPTION 5 to Section 130.2(b): Replacement of existing pole mounted luminaires in hardscape areas meeting all of the following conditions:

A. Where the existing luminaire does not meet the luminaire BUG requirements in Section 130.2(b); and
B. Spacing between existing poles is greater than six times the mounting height of the existing luminaires; and
C. Where no additional poles are being added to the site; and
D. Where new wiring to the luminaires is not being installed; and
E. Provided that the connected lighting power wattage is not increased.

EXCEPTION 6 to Section 130.2(b): Luminaires that illuminate the public right of way on publicly maintained roadways, sidewalks, and bikeways.

(c) **Controls for Outdoor Lighting.** Outdoor lighting controls shall be installed that meet the following requirements as applicable:

EXCEPTION 1 to Section 130.2(c): Outdoor lighting not permitted by a health or life safety statute, ordinance, or regulation to be turned OFF.

EXCEPTION 2 to Section 130.2(c): Lighting in tunnels required to be illuminated 24 hours per day and 365 days per year.

1. All installed outdoor lighting shall be controlled by a photocontrol or outdoor-astronomical time-switch control, or other control capable of ~~that~~ automatically ~~turns~~ shutting OFF the outdoor lighting when daylight is available.
2. All installed outdoor lighting shall be ~~circuited and~~ independently controlled from other electrical loads by an automatic scheduling control.
3. All installed outdoor lighting, where the bottom of the luminaire is mounted 24 feet or less above the ground, shall be controlled with automatic lighting controls that meet all of the following requirements: