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Comments regarding the Residential Light section of T24 2019 Proposed Amendments

Additional submitted attachment is included below.

David Wilds Patton, L.C.
P.O. Box 1621,
Pacifica, CA 94044-6621
PHONE: 650-574-2371 FAX: 650-989-4076
E-MAIL: DWPATTON@DWPLIGHTINGDESIGN.COM
WEBSITE: HTTP//WWW.DWPLIGHTINGDESIGN.COM

To whom it may concern,
I would like to add my comments regrading the proposed amendments to the Residential Lighting section of the 2019 T24.

- In the following section, it is proposed to delete this:

~~H. An Energy Management Control System (EMCS) may be used to comply with vacancy sensor requirements in Section 150.0(k) if at a minimum it provides the functionality of a vacancy sensor in accordance with Section 110.9, meets the installation certificate requirements in Section 130.4, the~~
~~S requirements in Section 130.5(f), and complies with all other applicable requirements in Section~~
~~150.0(k)2.~~

The ability to use the EMS to provide this functionality is sometimes the *only* way to achieve compliance without extensive remodel, especially in cases of retrofit construction. This, again, is ***not*** cost neutral. I request that this section NOT be deleted.

- In this section, I have always believed that this requirement is *not* cost -neutral or -saving. Please show me where this is proven. Therefore, in keeping with the spirit and letter of the Standards, I believe this section should be deleted. As a person who has engaged with the Standards making since 2005, I see that this actually comes from the history of the Standards when some sources were allowed to be low efficacy and some high efficacy. Now, with all sources, as high efficacy, this is an unnecessary, expensive addition, that can't be justified as cost -saving or -neutral:

JI. In bathrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces shall be controlled by an occupant or vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it shall be initially configured to manual-on operation using the manual control required under Section 150.0(k)2C.

- I do not believe this section needs to be revised. The change institutes the same thing it replaces. The wording change is unnecessary. The original wording actually seems clearer.

~~KJ. Dimmers or vacancy sensors shall control all luminaires required to have light sources compliant with~~ ~~l~~Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, shall have dimming controls.

- Although this section may be perceived as a *best practice*, as it does not affect the *energy savings* of the installation, it should be removed from the Standards. It simply doesn't save energy or make it easier to save energy.

~~L~~K. Undercabinet lighting shall be ~~switched~~ controlled separately from ~~other~~ ceiling-installed lighting ~~systems~~ such that one can be turned on without turning on the other.

Please note my markup of the actual amendment proposals on the following pages, included for clarity.

Yours respectfully,
David Wilds Patton, LC

David Wilds Patton

Digitally signed by David Wilds Patton
Reason: I am approving this document
Location: Pacifica, CA
Date: 2018.02.22 10:14:26 -08'00'

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 2 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 abut securely against all framing members.

EXCEPTION 4 3 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 4 to Section 150.0(j)2: Piping installed completely surrounded with a minimum of 1 inch of in attics, crawlspace, or wall insulation 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.** Pipe insulation shall meet the insulation protection requirements of Section 120.3(b). 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 be installed with a cover suitable for outdoor service, including but not limited to aluminum, sheet metal, painted canvas, or plastic cover. The cover shall be water retardant and provides shielding from solar radiation that can cause degradation of the material.

   B. Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall have a Class I or Class II vapor retarder.

(k) **Residential Lighting.**

1. **Luminaire Requirements**

   A. **Luminaire Efficacy.:** All installed luminaires shall meet the requirements be high efficacy in accordance with TABLE 150.0-A.

   B. **Blank Electrical Boxes.** The number of electrical boxes that are more than 5 feet above the finished floor and do not contain a luminaire or other device shall be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control.

   C. **Recessed Downlight Luminaires in Ceilings.** In addition to complying with 150.0(k)1A, luminaires recessed into ceilings shall meet all of the following requirements:

      i. Be listed, as defined in Section 100.1, for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and

      ii. Have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283. An exhaust fan housing shall not be required to be certified airtight; and

      iii. Be sealed with a gasket or caulk between the luminaire housing and ceiling, and shall have all air leak paths between conditioned and unconditioned spaces sealed with a gasket or caulk; and

      iv. For luminaires with hardwired ballasts or drivers, allow ballast or driver maintenance and replacement to be readily accessible to building occupants from below the ceiling without requiring the cutting of holes in the ceiling; and

      v. Shall not contain screw base sockets; and

      vi.v. Shall contain light sources that comply with References Joint Appendix JA8, including the elevated temperature requirements, and that are marked "JA8-2016-E" as specified in Reference Joint Appendix JA8.

D. **Electronic Ballasts for Fluorescent Lamps.** Ballasts for fluorescent lamps rated 13 watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

E. **Night Lights, Step Lights and Path Lights.** ~~Permanently installed night lights and night lights integral to installed luminaires or exhaust fans shall be rated to consume no more than five watts of power per luminaire or exhaust fan as determined in accordance with Section 130.0(c).~~ Night lights, step lights and path lights shall not be required to be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens.

F. **Lighting Integral to Exhaust Fans.** Lighting integral to exhaust fans shall meet the applicable requirements of Section 150.0(k).

EXCEPTION to Section 150.0(k)1~~F~~G: Lighting installed by the manufacturer in kitchen exhaust hoods.

G. **Screw based luminaires.** Screw based luminaires shall ~~meet all of the following requirements:~~

~~i. The luminaires shall not be recessed downlight luminaires in ceilings; and~~

~~ii. The luminaires shall~~ contain lamps that comply with Reference Joint Appendix JA8~~; and~~

~~iii. The installed lamps shall be marked with "JA8-2016" or "JA8-2016-E" as specified in Reference Joint Appendix JA8~~.

EXCEPTION to Section 150.0(k)1G: Luminaires with hard-wired ballasts for high intensity discharge lamps.

H. **Light Sources in Enclosed or Recessed Luminaires.** Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including mark~~ed~~ing requirements, ~~"JA8-2016-E"~~ shall not be installed in enclosed or recessed luminaires.

2. **Interior Lighting Switching Devices and Controls.**

A. All forward phase cut dimmers used with LED light sources shall comply with NEMA SSL 7A.

B. Exhaust fans shall be ~~switched~~ controlled separately from lighting systems.

EXCEPTION to Section 150.0(k)2B: Lighting integral to an exhaust fan may be on the same ~~switch~~ control as the fan provided the lighting can be ~~switched~~ turned OFF in accordance with the applicable provisions in Section 150.0(k)2 while allowing the fan to continue to operate ~~for an extended period of time~~.

C. ~~Luminaires~~ Lighting shall ~~be switched with~~have readily accessible wall-mounted controls that ~~permit~~ allow the ~~luminaires~~ lighting to be manually ~~switched~~ turned ON and OFF.

EXCEPTION to Section 150.0(k)2C: Ceiling fans may provide control of integrated lighting via a remote control.

D. Lighting controls and equipment shall be installed in accordance with the manufacturer's instructions.

E. No controls shall bypass a dimmer, occupant sensor or vacancy sensor function where that dimmer or ~~vacancy~~ sensor has been installed to comply with Section 150.0(k).

F. Lighting controls shall comply with the applicable requirements of Section 110.9.

G. An Energy Management Control System (EMCS) may be used to comply with ~~dimmer~~ control requirements in Section 150.0(k) if at a minimum it provides the functionality of ~~a dimmer~~the specified controls in accordance with Section 110.9, meets the installation certificate requirements in Section 130.4, meets the EMCS requirements in Section 130.~~5~~0(~~f~~e), and complies with all other applicable requirements in Section 150.0(k)2.

Why take this out?

~~H. An Energy Management Control System (EMCS) may be used to comply with vacancy sensor requirements in Section 150.0(k) if at a minimum it provides the functionality of a vacancy sensor in accordance with Section 110.9, meets the installation certificate requirements in Section 130.4, the EMCS requirements in Section 130.5(f), and complies with all other applicable requirements in Section 150.0(k)2.~~

Why is this necessary and is it proven to be cost neutral?

~~I~~H. A multiscene programmable controller may be used to comply with dimmer requirements in Section 150.0(k) if at a minimum it provides the functionality of a dimmer in accordance with Section 110.9, and complies with all other applicable requirements in Section 150.0(k)2.

~~J~~I. In bathrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces shall be controlled by an occupant or vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it shall be initially configured to manual-on operation using the manual control required under Section 150.0(k)2C.

~~K~~J. ~~Dimmers or vacancy sensors shall control all luminaires required to have light sources compliant with~~Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, shall have dimming controls.

Why? How does this save energy?

EXCEPTION 1 to Section 150.0(k)2K: Luminaires in closets less than 70 square feet.

EXCEPTION 2 to Section 150.0(k)2K: Luminaires in hallways.

~~L~~K. Undercabinet lighting shall be ~~switched~~ controlled separately from ~~other~~ ceiling-installed lighting ~~systems~~ such that one can be turned on without turning on the other.

This says the same thing. It doesn't need to be changed.

3. **Residential Outdoor Lighting.** In addition to meeting the requirements of Section 150.0(k)1A, luminaires providing residential outdoor lighting shall meet the following requirements, as applicable:

A. For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, shall meet the requirement in item i and the requirements in either item ii or item iii:

i. Controlled by a manual ON and OFF switch that ~~does not override to ON~~permits the automatic actions of ~~Items~~ items ii or iii below; and

ii. Controlled by a photocell and either a motion sensor or an automatic time switch control~~. Controls that override to ON shall not be allowed unless the override automatically reactivates the motion sensor within 6 hours~~; or

iii. Controlled by an ~~one of the following methods:~~

~~a. Photocontrol and automatic time switch control. Controls that override to ON shall not be allowed unless the override shall automatically return the photocontrol and automatic time switch control to its normal operation within 6 hours.; or~~

~~b. A~~astronomical time clock control.

Controls that override to ON shall not be allowed unless the override ~~shall~~ automatically returns the ~~astronomical clock to~~automatic control to its normal operation within 6 hours. An ~~and which is programmed to automatically turn the outdoor lighting OFF during daylight hours; or~~

~~c.~~ ~~E~~energy management control system that provides the specified lighting control functionality and complies with all requirements applicable to the specified controls may be used to meet these requirements~~which meets all of the following requirements:~~

~~At a minimum provides the functionality of an astronomical time clock in accordance with Section 110.9; meets the Installation Certification requirements in Section 130.4; does not have an override or bypass switch that allows the luminaire to be always ON; and, is programmed to automatically turn the outdoor lighting OFF during daylight hours~~.

B. For low-rise ~~multifamily~~ residential buildings with four or more dwelling units, outdoor lighting for private patios, entrances, balconies, ~~and~~ porches; and ~~outdoor lighting for~~ residential ~~carports~~ with less than eight vehicles per site shall comply with ~~one of the following requirements~~either:

i. ~~Shall comply with~~ Section 150.0(k)3A; or

ii. ~~Shall comply with t~~The applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.

C. For low-rise residential buildings with four or more dwelling units, any outdoor lighting for residential parking lots or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by Section 150.0(k)3B or 150.0(k)3D shall comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.

~~D. Outdoor lighting for residential parking lots and residential carports with a total of eight or more vehicles per site shall comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.~~

4. **Internally illuminated address signs.** Internally illuminated address signs shall either:

   A. Comply with Section 140.8; or

   B. ~~Shall c~~Consume no more than 5 watts of power ~~as determined according to Section 130.0(c)~~.

5. **Residential Garages for Eight or More Vehicles.** Lighting for residential parking garages for eight or more vehicles shall comply with the applicable requirements for nonresidential garages in Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.

6. **Interior Common Areas of Low-rise ~~Multi-Family~~Multifamily Residential Buildings.**

   A. In a low-rise multifamily residential building where the total interior common area in a single building equals 20 percent or less of the floor area, permanently installed lighting for the interior common areas in that building shall be high efficacy luminaires and controlled by an occupant sensor.

   B. In a low-rise multifamily residential building where the total interior common area in a single building equals more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building shall:

      i. Comply with the applicable requirements in Sections 110.9, 130.0, 130.1, 140.6 and 141.0; and

      ii. Lighting installed in corridors and stairwells shall be controlled by occupant sensors that reduce the lighting power in each space by at least 50 percent. The occupant sensors shall be capable of turning the light fully on and off from all designed paths of ingress and egress.

(l) RESERVED

(m) **Air-Distribution and Ventilation System Ducts, Plenums, and Fans.**

1. **CMC Compliance.**

   A. All air-distribution system ducts and plenums, including, but not limited to, mechanical closets and air-handler boxes, shall ~~be installed, sealed and insulated to~~ meet the requirements of the CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition, incorporated herein by reference.

   B. Portions of supply-air and return-air ducts and plenums of a space heating or cooling system shall either be insulated to:

      i. a minimum installed level of R-6.0 ~~(or any higher level required by CMC Section 605.0),~~ or

      ii. a minimum installed level of R-4.2 when the duct system is located entirely in conditioned space as confirmed through field verification and diagnostic testing in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.8.

      EXCEPTION 1 to Section 150.0(m)1B: Portions of the duct system located in wall cavities are not required to be insulated if the following conditions are met:

      i. The cavity, duct or plenum is located entirely inside the building's thermal envelope as confirmed by visual inspection.

      ii. At all locations where portions of non-insulated cavities, ducts, or plenums make a transition into unconditioned space, the transition shall be air-sealed to prevent air infiltration into the cavity and be insulated to a minimum of R-6 as confirmed by visual inspection.

      EXCEPTION 2 to Section 150.0(m)1B: Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated.