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Additional submitted attachment is included below.

October 18, 2017

California Energy Commission
Commissioner Andrew McAllister
Docket No. 17-BTSD-01
Docket Unit: MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

RE: Docket No. 17-BTSD-01 – Comments on 2019 Title 24 Part 6 “Express Terms” Draft

Legrand, especially its California based Wattstopper lighting control brand, appreciates this opportunity to submit comments on the “Express Terms” Draft of the 2019 Title 24 Standard. We gratefully acknowledge the significant work put forward by all proposal teams, commission staff, commission consultants and other contributors to improve the energy efficiency and applicability of the Title 24 lighting and lighting control related sections. The below comments repeat and add to the ones we provided directly to the CEC during the Pre-rulemaking Draft Express Terms workshop on October 4.

Title 24 Part 6 General Comment

Having reviewed the code regularly since automatic lighting controls were included, we do not think the lighting control section of Title 24 Part 6 is as complex as some have claimed. That said, we are thankful that the CEC reviews the code language every cycle to see if it can be simplified and the code’s intents made clearer. In the Express Terms Draft we’ve seen instances where the language has been improved, but many others where code language has been removed from one paragraph and moved around making it harder to understand the overall intent. Section 130.1(c)3 for instance takes the occupancy sensor applications that were listed in separate easily understood paragraphs and combines part of the language in one paragraph, with later paragraphs then providing additional requirements for some of these occupancy sensor applications. Unfortunately, we do not think this revision has added any clarity to the code. We also think it is unclear when exceptions for a section appear at the very end of the section instead of under the first subsection, as happened with Exceptions 1-4 (covering 24/7 areas, electric closets etc...) in section 130.1(c).

Section 100.0(a) - Scope

We appreciated hearing from the presenters at the October 4th CEC meeting that one of the larger ambitions this code cycle was to have the Energy Code apply to Hospitals, and we’re pleased that OSHPD was amenable to this change. We’re guessing that because of this agreement, in Section 100.0(a), “I” has been added to the list of occupancy types the code covers. However, “I” includes more than just Hospitals, and we’re wondering whether the commission has fully considered the unique requirements of all institutional facilities, especially prisons. Because of the exceptional safety and security concerns at these sites, the departments overseeing them call for specific lighting and controls project requirements, and expect these to be implemented regardless of the Energy Code. We note that language was added that exempts Healthcare Facilities from some

requirements of the Energy Code, **but wanted to verify the CEC had considered the consequences should all “I” facilities be added to the code’s scope.**

Section 110.9 – Mandatory Requirements for Lighting Controls

We’re aware of the considerable effort expended by the Commission in the past to move the mandatory control language in Title 24 to Title 20. Because of that we do not fully understand why the language is being copied back into Title 24. We would like to hear a clear explanation of the benefit of having language in both Title 20 and Title 24, especially since the two codes are not aligned on their revision schedules.

Additionally, in the 2016 Title 24 code for this section, there was a new requirement that in non-residential applications, occupancy sensors must be set up so lighting would go off after a time delay of 20 minutes or less (except in hotel rooms). This 20 minute max requirement (previously in Section 110.9(b)4F) has been eliminated from the 2019 code. We question what research justifies this change to allow longer time delays, since this would cause a corresponding reduction in energy savings. (See the seminal study on this subject in the 2000 IES Paper provided by the Lighting Research Center: “The effects of changing occupancy sensor timeout setting on energy savings, lamp cycling, and maintenance costs” by Dorene Maniccia et al available at <http://www.lrc.rpi.edu/resources/pdf/dorene2.pdf>). **We recommend leaving the max 20 minute setting (except for hotels) in the code.**

Section 110.12 – Demand Response

As the chief author of the letter provided to the California Energy Commission from the California Energy Alliance (CEA) regarding demand responsive controls, we applaud the decision to specifically name OpenADR2.0a or 2.0b as the protocol used to instigate a DR action, **although to future proof the code, adding the phrase “or later versions” would be warranted.** We strongly believe clear direction and application of demand responsive controls will be a significant asset to stable and resilient power in California. This change will ensure that lighting controls installed to meet this code section will easily be able to respond to signals from the state Investor Owned Utilities (IOUs) without additional cost, therefore providing much greater value to the building owner than currently installed systems provide. We furthermore urge the commission to consider the other recommendations the CEA provided to the California Energy Commission under separate letter (such as a reduction of the .5W/ft² exemption and requiring DR capability for large exterior lighting loads), and hope efforts are made to provide a simple testing method for the CLCATTs who need to verify the system’s performance.

Section 130.1(a) - Area Control

Area Controls ensure that occupants always have control of their lighting. The suggestions in this section are especially important since we believe they strengthen this foundational element.

EXCEPTION 1 to Section 130.1(a)2 (previous)

We have heard from specifiers that Exception 1 to Section 130.1(a)2 should not be restricted to just the listed space types. Designers should be allowed to take advantage of this exception for any space they consider appropriate, as there are other space types where remotely mounted and annunciated lighting controls could be beneficially applied (libraries, warehouse aisles, exercise gyms, lobbies, child care facilities, locker rooms, dressing rooms, etc...). **We recommend the Energy Commission remove the specific list of spaces in this language and allow the use of remote annunciated area control devices wherever specifiers determine they are appropriate based on their understanding of the safety and security requirements of the space.**

Additionally, in cases where area controls are located away from where the controlled lighting can be viewed, the previous code stated the area being lit should be “annunciated”. It has now been

changed to “provide a display”. As announced was clearly understood, would appreciate hearing why a different term is being introduced since some might think a display is now required.

EXCEPTION 2 to Section 130.1(a)2 (previous)

This previously included exemption allowed switches accessible to authorized personnel (i.e. key switches) in garages, stairwells, corridors, and 2 or more stall bathrooms. This was an important paragraph because it recognized that many specifiers do not want visitors in these spaces to control the lights since others might be negatively affected. **We strongly suggest that this paragraph be added back into the code**, as it seems to be a substantive change. And similar to our comment about Exception 1 to Section 130.1(a)2 (previous), we wonder if key switches should be allowed in any space if determined by the specifier.

Section 130.1(a)4 (proposed)

We wish the commission would again list occupancy sensors as an area control device, as was included in earlier versions of the code (up until 2008). Occupancy sensors offer ideal control in public restrooms and warehouse aisle applications. This change would eliminate the issue of having switches in spaces where they are rarely, if ever, used – we’ve never heard of a warehouse owner that finds it beneficial to install a switch in every aisle when their users are driving fork lifts. They already have occupancy sensors installed in the aisles, and the lights come full on automatically. In public restrooms, key switches are often installed but never used because of the risk of someone coming in and not getting the lights on.

Section 130.1(b) – Multilevel

Believe there may be an issue between the language in the code text, and text in Table 130.1-A. In the code, there is an exemption for restrooms (EXEMPTION 2 to Section 130.1(b)), but in Table 130.1-A bathrooms are required to have one control step between 30-70 percent of full power. **One of these is incorrect and should be changed.**

Similarly, there’s an issue in this section in that classrooms (previously Exception 1 to Section 130.1(b)) has been removed entirely from the language of the code, but classrooms are still listed in Table 130.1-A as an exception requiring one step between 30-70 percent of full power. **One of these must be incorrect and should be changed.**

Would be interested in understanding why areas that were required to have Partial or Full Off by Occupancy Sensors are required to have a step between 20-60% full power in Table 130.1-A instead of the 30-70% range normally called out.

Section 130.1(c) – Automatic Shut Off Controls.

We consider this section to be particularly important, because for some types of Alterations only the Area Control and Automatic Shut Off Controls are required. Shutting off lights when they’re not needed is a key element in every Energy Code.

Section 130.1(c)1A – Auto Shut Off Devices

A Captive Key switch is not an automatic shut off device by itself, but an input to an automatic shut off system. However, the 2019 code draft includes this device in the Auto Shut Off device list. Believe this was probably added in an editing error because the previous code allows Captive Key switches as an input to a schedule system to allow more than the max 2 hour override. We’re not against Captive Key switches being included for the previous code’s application, but it should not be listed as an automatic shut off device because there’s no “automatic” function associated with it. **This device should be removed from this paragraph.**

Section 130.1(c)1D – Separate Control

Believe “floor, wall, display” instead be “floor display, wall display”? Do not believe that “floor lighting” has a definition in the code, but “floor display” and “wall display” does.

Section 130.1(c)1F – Manual On for Scheduling

At the CEC meeting on June 22nd, a CASE report was presented showing that significant energy could be saved by mandating some spaces use a Manual On scheduling system compared to an Automatic On scheduling system. Because of that report we are surprised that Manual On scheduling is not mandated for any specific spaces. To our knowledge no scheduling system other than the simplest timeclocks lack the ability to do Manual On as part of its schedule. Unfortunately, many owners will set their systems initially to Auto On and waste possible energy savings, especially if holiday dates are not entered into the system, which is why we hoped to see Manual On for certain spaces in facilities that use a scheduling system for Auto Off.

Section 130.1(c)1H – Partial Off

It seems like definitions are becoming the repository for specific info (Daylight Zones definitions now include how they are to be calculated for instance). Why then is the “at least 50%” reduction requirement listed here, instead in the Partial Off definition in Section 100?

Section 130.1(c)2 – Countdown Timers

We strongly recommend that **countdown timers be allowed as an acceptable automatic shut-off control method for closets and small to medium storage spaces** to allow builders and owners a cost-efficient choice for automatic shut-off control in these areas. Countdown timers were permissible under the Title 24 2013 Standard for closets under 70 square feet, and they provided a simple and suitable method for automatic shut-off in small to medium, infrequently accessed storage spaces. Most storage space facilities used these devices previously in their units, and it never made sense to prohibit their use for this application.

SECTION 130.1(c)3 – Occupancy Sensors

Thank you for adding restrooms to the list of spaces required to use occupancy sensors, as it is well documented that they are an ideal space for occupancy sensors.

In the same section however, we wonder why the language was changed to “office areas” versus “offices”. I know this phrase is also used in Section 130.5(d) but I was unable to find it in the definitions section. Is any area in an office a “office area”?

SECTION 130.1(c)3 – Occupancy Sensors Partial and Manual On

We believe a significant negative change has been introduced in the code with the elimination of Partial On or Manual On sensors in areas required to have mandatory multilevel lighting per 130.1(b). Removal of this section seems like a substantive change that will significantly increase the amount of wasted lighting power in all mandatory occupancy sensor spaces during the day. Had there been a CASE report for this presented, we would have strongly argued against it at the time, but no CASE report on this was ever offered. **This entire section should be put back in the code for 2019.** (Also, please use “Manual On” and not “Vacancy” as the proper description in the non-residential code since “Vacancy Sensors” includes unique requirements in Title 20 due to their original use in the residential code that would be problematic in non-residential spaces.)

SECTION 130.1(c)4 – Occupancy Sensors in corridors, stairwells, ramps, etc...

Because of the changes with the significant rewrite in this section, there are two issues that exist here. First off is the phrase “may be configured with a partial-off function”, since that seems to indicate that there is no need for the lights go full off when space is vacant (especially since the header line “Areas where full or partial OFF occupant sensing controls are required” was deleted).

Secondly, the line “Lighting installed in the following areas shall meet the following requirements in addition to complying with Section 130.1(c)1” has been deleted. We cannot believe the intent is to allow lights in these areas to remain partially on at all times. At the very least **the line about complying with Section 130.1(c)1 should be added back into the code to make it clear that these spaces are required to go off at some point in time** (except for the Egress Lighting exemption).

EXCEPTION to SECTION 130.1(c)4 – Egress lighting per Title 24, Part 2, Section 1008

Previously the code allowed a specific wattage to be exempted from the automatic shutoff requirement for egress areas – and in fact that amount had been increased in 2016 from .05W/ft² to .1W/ft². Would be interested in understanding why that method has now been removed, and replaced with this new exemption that doesn't define the allowed wattage at all.

SECTION 130.1(c)5 – Partial Off in parking garages, high-rise resi stairwells and corridors...

The section previously called out the specific areas in multifamily and hotel/motel structures that had to use Partial Off sensors, and that language was replaced with “and for any lighting that provides means of egress illumination required by California Building Code Section 1008”. It was clear having this section list out High Rise Residential and Motel/Hotel Corridors – are these sections covered by the new language, and what other areas in these buildings would be covered by the new language? In this case pointing to a different code is not helpful to the reader.

SECTION 130.1(c)6 – Card Key Switches

Was the intent to eliminate the use of card key switches, since they are not listed as part of 130.1(c)1A, or would they be considered an automatic shut off via the “other control function”? These devices were useful in Hotel/Motel guest rooms, since they prevented accidental off sweeps from timeclocks or occupancy sensors, which would have likely caused them to be overridden or removed after the acceptance test. Hopefully Card Key Switches have not been eliminated from the code.

EXCEPTION 6 to SECTION 130.1(c) – Healthcare facilities

The definition section lists HEALTHCARE FACILITY as any building or portion thereof licensed pursuant to California Health and Safety Code Division 2, Chapter 1, §1204 or Chapter 2, §1250.

Do not understand why all spaces inside a healthcare facility would be exempt from the entire automatic shutoff section. While it's quite reasonable that any space where a medical procedure is taking place would be exempted, spaces such as filing areas, offices, storage areas, lobbies, etc... should have to follow the shutoff requirements of the code. **This section should be re-written to identify which specific spaces in Healthcare facilities do or do not require shut off controls.**

SECTION 130.1(d) – Automatic Daylighting Controls

Previously there was a line in this section that made clear that modular walls were not to be considered permanent structures, which helped people who looked at the code avoid a design issue with their projects. Thought it was helpful for folks reviewing the code, so it would be beneficial to leave that line in.

Seeing as how there is now a new 1500 hour calculation exemption for Skylights, would suggest that language should be developed to also allow an exemption for Primary Sidelit and Secondary Sidelit spaces since they too can be in places without adequate daylighting, and cause frustration with both owners and CLCATT who are trying to verify their installations.

SECTION 130.1(d)3A – Automatic Daylighting Controls in multilevel control spaces

This section references 130.1(c) as the multilevel requirement, should that have been 130.1(b)?

EXCEPTION 1 to Section 130.1(d)2Dii - lighting power density less than 0.3 W/ft²

Applaud the removal of this section – since the multilevel requirement in 130.1(b) applies to spaces greater than .5 W/ft² (and greater than 100 ft²), having this section call out a multilevel control requirement for spaces above 0.3 W/ft² was confusing.

SECTION 130.1(f) – Controls Coordination

The only real issue we've seen regarding coordination of the different 130.1 sections has been the question of whether a manual control device can override daylighting control above its settings. **Would like to see this entire section eliminated, and section 130.1(d) include description of an allowed override of max 2 hours, or item number 6 changed so that an override of up to 2 hours is allowed.**

Additionally, we are not aware of any currently available system that allows an occupant's raised level to becoming the new daylight/electric setpoint for the space – would be much simpler to explain to an occupant, and easier to test for CLCATT compliance, if this override was treated similar to an afterhours evening override where the tenant sets the electric light level they desire, and the lights are then overridden and are not controlled by the daylighting system for a specific amount of time. Please do not create a new sequence of operation that would confuse occupants in the space, and simply include an allowed override of max 2 hours as recommended above.

SECTION 130.2 – Outdoor Lighting Controls and Equipment Proposal

Given the CEC's concern about linking to a different code (the justification for copying product requirements in Title 20 to Title 24 Section 110.9), we are confused by the decision that this section chose to link to Title 24, Part 11, Section 5.106.8 regarding BUG standard. We applaud the decision to do so here, and wonder why it's a problem to link to Title 20 for product features in 110.9?

Having attended the CASE review meeting at the CEC on June 22, 2017, we were surprised by how few of the discussed exterior changes made it into the code – in some cases we saw this as beneficial (a few changes seemed to be overly complicated). However, there are several items we wish to draw attention to:

1) The removal of the mandatory requirement for occupancy sensors on luminaires mounted less than 24' is significant. **This seems a substantive change** - was there a CASE report for eliminating this requirement?

2) The line "All installed outdoor lighting shall be independently controlled from other electrical loads by an automatic scheduling control" has been eliminated by the code. We believe this is a mistake - ensuring that lighting is separately controlled from other loads is good practice and should continue to be included in the code. **We recommend adding back a line similar to "All installed outdoor lighting shall be independently controlled from other electrical loads by required automatic lighting controls".**

EXCEPTION 4 to Section 130.2(c)3 (previous)

Was it truly the intent to control ALL installed outdoor lighting? Previously the code included the line "Applications listed as Exceptions to Section 140.7(a) shall not be required to meet the requirements of Section 130.2(c)3". This seems a more reasonable approach since there are lighting types in Section 140.7(a) where it would be hard to justify the additional controls (temporary lighting, FAA lighting, Public Monument Lighting, etc...). **Either the line providing an exemption for lighting called out in Section 140.7(a) should be put back in the code, or the CEC needs to review all types of lighting called out in this section and see which should specifically be added as exemptions to 130.2(c)3.**

EXEMPTION 2 to Section 130.5(d) - Plug Load Control

Similar to the issue with EXCEPTION 6 to SECTION 130.1(c), we do not understand why ALL spaces in Healthcare facilities would be exempt from this requirement. When someone reviews the list of spaces that require plug load (Offices areas, lobbies, conference rooms, kitchens in office areas, and copy rooms) it seems that having plug load in these spaces would not endanger the safety of any person in the facility. **Would suggest removing this exemption in entirety.**

Section 140.6(a)2 – Power Adjustment Factors

Don't understand why there is a now a PAF allowed for Clerestories, since those have been treated similar to any other vertical glazing which produces a Primary Sidelit zone and possibly a Secondary Sidelit zone in a space.

Section 140.6(a)4B – Tunable Luminaires

Applaud the CEC for coming up with a simple method of adjusting the wattage of a tunable luminaires (.75x max wattage for tunable luminaires), and listing a minimum CCT range. Not positive this will be the best way to handle variable wattage likely in a tunable luminaire, but it appears to be a good faith first step.

Section 141.0(b)2F – New Lighting Systems

Do not understand why 130.5(d) is not included in the list of sections that must be followed. This basically ensures that a tenant in a core and shell building never has to add Plug Load Control when their space is built out. **The CEC should add 130.5(d) to the list of sections listed in this line of the code.**

Section 141.0(b)2I – Altered Lighting Systems

Applaud the CEC attempting to make this section more understandable, as during all the occasions we've educated people on the Energy Code, this section has always garnered the most questions. Believe the list of the three possible space changes (i, ii, or iii) offers simplicity that hasn't been there previously. Especially thankful at the use of "luminaire-for-luminaire alteration" in the third space option, since this makes it clear that this option cannot be used during a typical tenant improvement where the lighting layout is completely changed.

However, this new language inadvertently created a significant issue because while Exceptions 1-5 to Section 141.0(b)2I applies previously to all three spaces, Exception 6 applied to only space iii. With this change Exemption 6 is now being applied to all three spaces, and it is not appropriate for spaces i or ii (which are already being handled by the 10% or less fixtures in a space exception). Allowing Exemption 6 would mean that entire Tenant Improvements or sizable portions of them could be done without ANY controls installed because there is a pass on the first 70 fixtures. Such a change would be a Substantive Change and allow an enormous waste of energy. **We strongly recommend that Exemption 6 be deleted entirely since it never applied to spaces i or ii previously, and add the fixture count exemption to iii.** Additionally, we believe that 70 fixtures is more than needed for a 5,000 ft² space, and it should be reduced to 50 or lower.

Section 141.0(b)2J – Luminaire Component Modification (previous), and Section 141.0(b)2K –Lighting Wiring Modification (previous)

Do not understand why these two sections have been moved to "Reserved" especially since questions come up all the time about what wiring changes in a space trigger other code section requirement. Will these show up in the 45 day language draft?

Section 141.0(b)2Piv – Electrical Power Distribution Systems Plug Load

We continue to believe that allowing a complete exemption for Plug Load Controls in Alteration is a huge mistake. As technological advancements provide ever lower lighting wattages, plug loads now represent a significant overall portion of every building's electrical load. Additionally, manufacturers have responded to plug load requirements by providing a range of different solutions for all spaces, from time of day scheduling in relay panels, to plug load control modules that can be controlled by the same occupancy sensors that control the lighting, to controllable plug load solutions with built in time clocks or that can be controlled wirelessly from other sensors. Plug Loads are required under the ASHRAE 90.1 Code, and we do not understand California's reticence to react to the lost energy savings when plug loads installed in a tenant improvement will cost more than plug loads installed in a new project.

Note that the language in Section 130.5(d) which this refers to is “Circuit Controls for 120-Volt Receptacles and Controlled Receptacles”, and the paragraph does not refer to power distribution systems.

The CEC could rectify this situation by the two following steps:

1) Change the line in the code to read:

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

2) Provide an exemption for some small number of newly installed receptacles, perhaps 20.

Section 150.0(k) - Residential Lighting

Switching over to the residential code for just two comments.

Section 150.0(k)1B – General Lighting


Do not think the CEC should be mandating CCT temperature for general residential lighting in the code or in JA-8. There may very well be places in a residence where an owner would want a light source of 4000K or above. Additionally, some cultural sensitivity should be considered, as there are populations of people around the world who prefer the cooler temperatures provided by higher CCT lighting. Also, some specifiers believe that older populations prefer higher CCT levels as well. The CEC’s mandate is to produce codes that are concerned with power, and **this section’s mandate of a maximum CCT level of 3500K for general lighting should be removed from the code.**

Section 150.0(k)1K – Controls on all luminaires that require JA8 light sources

Was surprised by the elimination of dimmers and vacancy sensors on all luminaires required to have light sources compliant with JA8. This seems like a substantial change and do not recall seeing an information on why such a change was needed for residential lighting in this code cycle.

If there is any discussion point in this letter where the CEC finds our concerns or proposals unclear, we hope that you’ll consider contacting us for clarifications. We’ve certainly enjoyed the opportunities we’ve had in the past to discuss the Energy Code language by phone, email, and in person, and hope to continue that positive relationship for many years to come.

Respectfully Submitted,



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