Measure BLD-3
Added Space Types and LPD values to Section 146

2008 California Building Energy Efficiency Standards

June 28, 2006

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Overview

Description	Two new project types have been identified by the Commission as needing specific LPD allowances and other rules, namely (a) Salons and (b) Video Conferencing Facilities. Models were built based on design recommendations of the IESNA in RP-2-01 and DG-17-05, respectively, and used to generate the specific recommended values contained herein.
Type of Change	The Change affects certain lighting power density values in Table 146-C, which are prescriptive lighting power allowances also used for baseline allowances in modeling. There is no other impact or change of scope.
Energy Benefits	The energy savings benefits are consistent, and to some extent greater than other LPD allowances contained in the Standard. Compared to common but less efficient designs, these proposed LPD allowances will save 25% or more of the energy use.

Non-Energy Benefits	These LPD allowances have no direct non-energy benefits.
Environmental Impact	There are no known adverse impacts.
Technology Measures	The proposed values for Salons assumes a design largely based on fluorescent twin tube technology using electronic ballasts, supplemented by a small amount of display lighting using halogen IR sources. The twin tube allows for relatively high efficacy lamps (>75 MLPW) but in compact luminaires appropriate for highly designed space having potentially many small compartments and high RCR. A retail component of approximately 25% of a retail store as modeled for the 2005 Tailored Method is included. Decorative lighting is assumed to be necessary but not particularly functional, and for which a "chandelier" allowance is recommended. The proposed values for Video Conferencing assumes all video lighting from fluorescent twin tubes operating on dimming ballasts. Two principal lighting systems are included – one for video face lighting and one for video wall lighting, as described in Table 1 Page 9 of DG-17-05.
Performance Verification	No field performance verification required.
Cost Effectiveness	The Measure is cost effective as any comparable lighting system regardless of inherent technology costs the same or more than the prototypes used in developing these standards.
Analysis Tools	Standard analysis tools can be used to analyze this measure. This specific work was developed using Lumen Micro 2000.
Relationship to Other Measures	None.

Methodology

For the Salon, a tenant style retail space of 2,010 sf is used as the model. There are eight hair cutting stations of 120 sf each; two nail stations of 100 sf each; a retail area of 150 sf; a POS of 100 sf; a seating area of 150 sf; circulation area of 150 sf; and back of house areas totaling 300 sf. This is based on a recent design by the analyst. Each hair cutting station and each nail station is assigned Category "E" and RCR ~ 7.0. The etail area is assigned Category G and RCR ~ 8.0. The balance of the front of house space is assigned Category C and RCR ~ 5.0. The back of house space is consistent with other projects and is assigned LPD = 0.8 w/sf for a mixture of locker, dressing and toilet.

For the Video Conferencing, an office space of 22' x 26' (572 sf) is used. This permits the VTC lighting plan shown in Figure 17 of DG-17-05. A total of (10) 2x2 special VTC luminaires each having 2-55 watt twin tube lamps and (10) 1x2 wallwash luminaire each having 1-55 watt twin tube lamp is assumed.

Analysis and Results

The Salon model indicates a lighting power density of 1.7 w/sf for a salon, including display lighting but not including decorative lighting in the method of the Area Category.

The Video Conference Model indicates 3.2 w/sf of which 2/3 is the video face lighting and 1/3 is the wallwash lighting. This is a special case condition and unique restrictions are described below.

Recommendations

A following allowed lighting power density values are recommended.

Table 146 –C

Hair, Nail and Beauty Salons and Barbershops	†	1.7* w/sf
Video Conferencing Rooms	†	3.2 w/sf

Note: for any room with general lighting equipped for video conferencing, up to 2.0 w/sf of lighting specifically for video conferencing may be added provided (a) the room has a permanently installed video conferencing facility (definition needed) and (b) the room is equipped with a preset lighting scene controller or interlocking manual controls to prevent the simultaneous operation of video conference lighting and any other lighting in excess of 1.2 w/sf.

Material for Compliance Manuals

The manual should explain that a video conference lighting system can be provided by either direct lighting specifically designed for video conferencing, or by a general indirect lighting system. In either case, when used in a general purpose room, controls must be provided to permit the lose-it-or-lose it power allowance for VTC.

Bibliography and Other Research

Technical data as follows:

IESNA RP-2-01 and IESNA Lighting Handbook, Ninth Edition, Design Guide
IESNA DG-17-05, “Fundamentals of Lighting for Videoconferencing”
Photometric data for VTC and wallwash luminaires from Engineered Lighting Products

Appendices

None

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