

# Public Review Draft

Proposed Addendum an to Standard 189.1-2017

# Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

First Public Review Draft (October 2019)  
(Draft Shows Proposed Changes to Current Standard)

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## **Foreword**

This proposal adds lighting control requirements for dwelling units to increase energy savings beyond the capabilities of energy efficient light sources alone. The proposal reflects the continued effort to develop Standard 189.1 as a high-performance extension of base codes. The changes would align Standard 189.1 with CA Title 24 Part 6 and ASHRAE 90.2.

Standard 189.1 to date contains no maximum lighting power density (LPD) allowances for dwelling units. In order to ensure energy efficiency in dwelling units, efficient light sources must be used in conjunction with energy-saving lighting controls such as dimmers, timers, or occupancy sensors. The use of such controls can not only contribute to energy savings, it can enhance indoor environmental quality (visual acuity and ambience), increase convenience, accessibility (universal design), and improve security.

Tables A.1 and A.2 below come from the Consortium for Energy Efficiency (CEE) Residential Lighting Controls Market Characterization report published Jan. 9, 2014. They show the energy savings enabled through the use of dimmer and timer controls for various room types and light sources.

## A.1 Dimmer Results

Room Type	Annual Energy Savings Per Control Unit (kWh/yr)					Payback Period (years)				
	Inc	Halogen	CFL	LED	Average	Inc	Halogen	CFL	LED	Average
Basement	8.3	6.7	6.2	5.8	5.3	30.5	37.8	40.9	44.1	47.6
Bathroom	27	30.8	21.4	18.6	24.8	9.4	8.3	11.9	13.6	10.3
Bedroom	43.9	49.1	23.9	20.4	37.4	5.8	5.2	10.6	12.5	6.8
Closet	-	-	-	-	-	-	-	-	-	-
Dining Room	46	49.8	29.9	22.3	42.9	5.5	5.1	8.5	11.4	5.9
Exterior	-	-	-	-	-	-	-	-	-	-
Garage*	-	-	-	-	-	-	-	-	-	-
Hall	24.1	26.3	19.5	16.6	22.5	10.6	9.7	13.1	15.3	11.3
Kitchen	57.3	45.8	45.1	39.6	39.7	4.4	5.6	5.6	6.4	6.4
Laundry/Utility Room	-	-	-	-	-	-	-	-	-	-
Living/Family Room	133.1	150.6	70.8	59.6	110.7	1.9	1.7	3.6	4.3	2.3
Office	9.4	10.3	7.6	6.5	8.2	27	24.7	33.5	39.1	31.2
Other	9.6	9.3	6.6	5.5	6.8	26.6	27.4	38.7	46	37.5
<b>Average</b>	<b>39.4</b>	<b>42.2</b>	<b>25.1</b>	<b>21.2</b>	<b>33.1</b>	<b>6.4</b>	<b>6</b>	<b>10.1</b>	<b>12</b>	<b>7.7</b>

## A.2 Timer Results

Room Type	Annual Energy Savings Per Control Unit (kWh/yr)					Payback Period (years)				
	Inc	Halogen	CFL	LED	Average	Inc	Halogen	CFL	LED	Average
Basement	28.2	22.7	7.6	7	14	14.3	17.7	53.2	57.1	28.8
Bathroom	75.9	86.8	21.7	19	62	5.3	4.6	18.6	21.2	6.5
Bedroom	-	-	-	-	-	-	-	-	-	-
Closet	-	-	-	-	-	-	-	-	-	-
Dining Room	-	-	-	-	-	-	-	-	-	-
Exterior	120.6	169.3	33.1	30.2	102	3.3	2.4	12.2	13.3	3.9
Garage*	38.1	48.1	10	9.5	15.1	10.6	8.4	40.1	42.3	26.7
Hall	-	-	-	-	-	-	-	-	-	-
Kitchen	-	-	-	-	-	-	-	-	-	-
Laundry/Utility Room	22.8	21.3	6.1	5.7	13	17.7	18.9	65.5	70.7	30.9
Living/Family Room	-	-	-	-	-	-	-	-	-	-
Office	-	-	-	-	-	-	-	-	-	-
Other	15.7	15.2	4.5	3.9	10	25.7	26.5	89.8	102.7	40.3
<b>Average</b>	<b>53.6</b>	<b>64</b>	<b>14.9</b>	<b>13.4</b>	<b>39.5</b>	<b>7.5</b>	<b>6.3</b>	<b>27.1</b>	<b>30</b>	<b>10.2</b>

<https://library.cee1.org/content/cee-residential-lighting-controls-market-characterization>

*[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]*

## **Addendum an to 189.1-2017**

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*Add new definitions to Section 3.2 as follows:*

**automatic shut-off control:** a device capable of automatically turning loads off without manual intervention. Automatic shut-off controls include devices such as occupancy sensors, vacancy sensors, motion sensors, programmable time switch, or count-down timers.

**dimmer:** a lighting control device that is capable of varying the light output and energy usage of light sources. (ANSI/ASHRAE/IES Standard 90.1)

*Add new Sections 7.4.6.6 and 7.4.6.7 as follows:*

**7.4.6.6 Dwelling Unit Lighting Controls.** *Permanently installed luminaires in laundry rooms, utility rooms, closets, and storage rooms in dwelling units shall be controlled with automatic shut-off controls.*

For all other spaces and exterior applications which are controlled from within a dwelling unit, where three or more permanently installed luminaires are controlled together, the control shall be either a dimmer or an automatic shut-off control.

Dwelling units with greater than 5000 ft<sup>2</sup> (460 m<sup>2</sup>) of conditioned floor area shall have a lighting control system that has the capability to turn off all permanently installed interior lighting from a control located at an exit door or have a lighting control system that has the capability to turn off all permanently installed interior lighting from remote locations.

**Exceptions to 7.4.6.6:**

1. Spaces using less than 10 W of total lighting power.
2. Lighting designed for safety or security.
3. Permanently installed night lighting that does not exceed 2 W per luminaire.